



EFFECTS OF THE ON-EXERCISING-BALL WEIGHT TRAINING ON FEMALE VOLLEYBALL PLAYERS' LEG MUSCLE PHYSICAL FITNESS

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ABSTRACT

. Purpose: to study and compare the effects of the on-exercising-ball weight training on female volleyball players' leg muscle strength physical fitness between the pre-training, the eighth week and the twelfth week Methods: 64 populations were female volleyball players. After using G*Power, the sample size included only forty eight. The 48 samples with low-medium leg dynamic strength were selected from the populations by using the leg dynamic strength test. Using match pair to divide the samples into groups. Twenty four in the experimental group participated the on-exercising-ball weight training. Another twenty four in the control group attended the on-flat-floor weight training. The training programs lasted twelve weeks, three days a week. Data was collected from the leg dynamic strength test, the vertical jump, and the standing board jump. Using One-way repeated measure. Using one-way analysis of variance and post-hoc multiple comparisons with Bonferroni's correction. Comparing the differences of each group's means of leg muscle strength physical fitness after the 12 week training with the t-test. The statistical significance was predetermined at the .05 level Results: the experimental group's leg dynamic strength, vertical jump, and standing board jump increased more highly after the eighth week at the .05 level of statistical significance ($p=.001$, $p=.001$, $p=.001$, respectively). The control group's vertical jump, and standing board jump increased more highly after the eighth week, only the control group's leg dynamic strength increased more highly after the twelve week at the .05 level of statistical significance. Both groups' leg muscle strength physical fitness increased after 12 weeks, however, the experimental group's leg muscle strength physical fitness increased more highly.

Keywords: leg muscle strength, weight training, exercising balls, volleyball

1. INTRODUCTION

Volleyball athletes, in addition to sports skills competitions, are also competing in the development of the highest physical fitness of each team. (Zetou, Tsigilis, 2007) Enhancing the ability of the leg muscles by training with weightiest program to improve muscle contractions (Fujii and Akazawa, 1979) improves strength, power, speed, and reduces injury prevention for volleyball players (Aghabei, 2010; Yan, Hung, Gau & Lin, 2014). Get Games Serving, Serving Hitting the ball Interception The ability to challenge a single opponent requires leg muscle strength, both in motion while playing the ball. (Fédération International de Volleyball, 2015), in a one-point challenge, takes about 7-10 seconds, and the break time of 11-14 seconds is strongly related to the power and strength of the leg muscles (Ministry of Tourism and Sport, The athlete's strength in leg muscles is also higher (Mroczek, Superlak, Kawczński & Chmura, 2017) the success of the sport depends on the skill and strength of the body, so leg muscle strength is an element that increases the chances of success for volleyball athletes. (Chuphong Chanarun, 2015)

Practicing with the simple weight, is one of the ways used to improve the strength by the scheduled training programs that use high heavy resistance, coupled with the training according to the program, practicing sports to develop muscle strength, coupled with the development of athletic skills (Yuya Watanabe, et al., 2015) said that weight training way's simple and effective training process, this is one of the possible ways to help add strength to the muscles and fine in accordance with (Poehlman and Melby, 1998), because while training and during competition, athletes require the ability to use erectile dysfunction leg muscle, both strength, durability, and muscle power recommended for the jumping skill in the vertical jump intercept and jump to SWAT challenge, the score jumps to hurled get the ball to the study of (Maffioletti, Cometti, Amiridis, Martin, Pousson & Chatard, 2000) found that the jumping ability of the shooter by practicing with the weight training, can also affect the performance of the athletes. So trainers or athletes, so it should neglect training to increase leg muscle power and muscle strength, to athletes, to be ready always

According to research involving muscle strength training on the ball, unstable is widely used in sports and has a positive effect on the development of athletic performance, such as (Anderson & Behm, Saeterbakken, Andersen, Jansson, Kvellestad & Fimland, 2014; Behm, Muehlbauer, Kibele & Granacher, 2015; Badr, 2014; Mercola, 2014) The findings of Goodman and the faculty (Craig A Goodman, Pearce, Nicholes, Gatt, & Fairweather, 2008) show that there is no difference in the 1RM value from the Chest Press posture from unstable surface training and stable surface training. The research (Zemková, 2017) has compiled research related to weightiest training on exercise balls. It concluded that weight training on unstable areas had a better effect on muscle performance than traditional training, in line with (Juan, 2000; Boyer, Hammer, Jepson & Thompson, 2006; Zemková & Hamar, 2013; Bauer, 2013; 2017;) The formulation of weightiest training programs on the ball is possible for physical fitness in women's volleyball players. (Yaparak, 2018) Guidelines for Training Programs for Volleyball Players a good trainer should consider the suitability. It can correct the shortcomings of the athlete spontaneously. It can bring out the highest talents of the athletes as much as possible. Therefore, the creation of a weight training program on the ball is used to improve leg muscle fitness in this research (Newton, et al., 1999; Mounir & Nermeen, 2008; Craig, 2001).

Ball exercise is equipped with high elasticity; there are two characteristics (Mercola, 2014) spherical ball with a diameter ranging from 45 - 75 cm. Like we were called a Swiss ball, fitness ball, gym ball, yoga ball, balance ball, and physics. And therapy ball and ball type, semi-circle with a diameter 58*28 cm. like we called as a Sobuball (Both Sides Utilized: BOSU) is

previously used widely, especially in the circles of rehabilitation in the group of athletes, sports trainers, or even groups of the exercise (Erwin, Fedewa, Ahn, & Thornton, 2016), with the aim for front ball exercise applied to increase the ability to maintain balance, increase muscle strength, core fatigue (Dicenso, 2017; Laudner & Koschnitzky, 2010) developmental challenge the work of the musculoskeletal system, the response of the nervous system (Waehner, 2017) by the use of ball exercise with the program to exercise more, to strengthen the strength of the muscles, especially the muscles associated with movement in everyday life. summertime days, or called “functional training” (Sharpe & Price, 2009; Justin, et al., 2018) highlight video of weight training on the ball exercise is to practice using weight training equipment, free weights, resistance, while the trainer must try poised on the device unstable from educational research (Zemková, 2017; Zemková, Jeleň, Radman, Svilar & Hamar, 2016) shows the effect of strength training on unstable affect the development of muscle power and strength of the muscles, but weight training on the ball exercise is to practice than usual, because while challenging the training, trainees must try to maintain a balance. With the resulting muscles, core fatigue development, including the intensity of training that can be adjusted both for replacing the data position of the body, the hands, the angle of movement and the weight from the equipment, free weights, (Craig, 2011), which is considered as a practice with the weightiest training concentration, can strengthen the performance of the body has many parts, while challenging coaching.

For this reason, the researchers want to study the results of weightiest training on the leg muscle strength, which will be researched to study the design of a variety of weightiest training programs by combining weight training principles on the ball to compare the effects of training on unstable surfaces (Bosu-ball and exercise balls) with weight training on the general floor. This research the results of the research are used to develop a training plan to develop potential development. The athlete's skills, as well as improvements in various sports, are more satisfactory with the results or statistics. This research is a rarely studied new research, so the results of the research can be used as a guide to the design of the leg muscle strength training program.

The Purpose of the study was to investigate 1. the effect of the training program with weight training on the ball exercise has on performance, the leg muscles of the sample pre-training, after training, 8 -12weeks, 2. to compare the performance leg muscles of pre-training, after training, 8, 12 weeks, of the samples group. and 3. to compare the performance of the worlds leg muscles after training, 12 weeks between the experimental group and the control group.

2. METHODOLOGY

This study is an experimental study of research design, 8 weeks after training and 12 weeks after training by the committee to certify humans Certificate number of Roi-Et Rajabhat University is 15/2562.

2.1 Population

The population is a volunteer volleyball club member. Healthy females A total of 68 people objected to the sample size by G*Power (3.1.9.4), based on the previous study of (Kibele & Behm, 2009) (Effect size $f=0.25$, Power = 0.95, $\alpha = 0.05$.we have 2group and 3 variable and has about 48 volunteers challenged the leg-stretching test to select those with moderate stretching force (1.74-2.41 kg/kg). Minimum level (1.33 1.69 kg/kg) According to the Physical Fitness Criteria, athletes of the University of Thailand (Tavorn Kamutsri, Amorn Treeraj, Chatchai Sriwilai & Jira Nabsanit, 2015)

2.2 Sample

A sample of 48 people, after a leg stretch test, then a stratified randomization of the samples in the experimental and control group, had equal leg muscle performance, with the group training with weight training on the ball (n = 24) and the control group trained on normal ground .

2.3 Instruments

- 2.3 1. Leg Muscle Strength Test Program applied to the Department of Physical Education's Field Fitness Test (Department of Physical Education, 2017)
- 2.3 2. Leg Muscle Strength Test (Katou & Yamasaki, 2009) using Leg dynamometer, Takei Back & Leg Dynamometer Model 5402 C
- 2.3 3. Vertical Jump (Sargent, 1921)
- 2.3 4. Standing Bord Jump (Wood, 2010)

2.4 Training Protocol

The weight training program on the ball, apply the theory of weight training (Jaruwat Yodchu, 2001; Bompa, 1993) Principles of Design Training Program (Fleck & Kraemer, 1987), The Principle of Exercise on the Ball (Juan, 2000), which was considered by the research equipment quality specialist, 3, the confidence of the entire training program was 0.94. The process of participating in the training program may have a potential impact on volunteers. Volunteers will be signed up for their consent to participate in the research. The training method of the sample is as follows:

TABLE 1
DETAILS OF WEIGHTIEST TRAINING PROGRAM ON THE EXPERIMENTAL GROUP'S BODY BALL

Posture	Week 1-4			Week 5-8			Week 9-12		
	65%1RM			75% 1RM			85% 1RM		
	Rep	Set	Rest (min.)	Rep	Set	Rest (min.)	Rep	Set	Rest (min.)
1.Barbell Squat on Bosu ball	10	2	1	8	3	1	8	4	1.30
2.Backward and forward Lunge on Bosu ball	10	2	1	8	3	1	8	4	1.30
3. Bosu Barbell Back Squa	10	2	1	8	3	1	8	4	1.30
4. Barball Deft lift on Bosu Ball	10	2	1	8	3	1	8	4	1.30
5. Hip Thrust with Stability ball	0	2	1	8	3	1	8	4	1.30

2.5 Data Collection

- 2.5 1. Before the study a week, the researchers challenged the fitness test leg muscles to stretch the legs with the test force the vertical jump and standing long jump, and informed the study participants to know the details of the training program, signed by the volunteers consent form, participated in the training program.
- 2.5 2. Experimental group experimental group challenge training with weight according to the program created by the researchers to replay the ball movement (Table 1). Through the challenging training period 17.00-18.30 hours. One week and three days are Monday, Wednesday and Friday by the experimental group in accordance with the program does not challenge the training, the date and time of coaching volleyball skills as described above.
- 2.5 3. Group control Challenge training according to the training program with sample weight, as usual in the moment, 17.00-18.30 pm. The week and 3 days are Monday, Wednesday and

Friday, respectively, the control group will not coach volleyball skills according to the challenge training program, the date and time as described above.

2.5 4. Challenge test leg muscle performance, by measuring the leg dynamic, the vertical jump and standing long jump practice week after 8: 00 and 12: 00 am with the experimental group page information, access to challenge test results analysis results, according to the program statistics to determine the performance of the leg muscles.

2.6 Statistical Analysis

Analyze the performance data of the results by looking for the average and standard deviation of the leg muscles. Testing whether the distribution is normal by using the test statistics tested by Shapiro-Wilk, it was found that the data distribution contained in the dataset is the arch of the normal distribution, so the difference of the variable was tested with statistical parameters Analyze the one-way variance of leg muscle performance before training after the 8th and 12th weeks of the trial and control group. If later analysis is found, the method used to find the difference is determined by Bonferroni Osaka's method of a couple of differences implied are statistically significant at $p < 0.05$. Test average difference erectile dysfunction leg muscle leg dynamic the vertical jump and standing long jump after training 12 weeks with Test t-value (independent sample t-test)

3. RESULTS OF STUDY

To find out the significant differences on leg muscle performance among athletes of the University of Thailand , mean, SD, t-ratio and F-ratio were computed and data pertaing to this, has been presented in Table 2 and 3.

TABLE 2
ANALYSIS OF VARIANCE OF LEG MUSCLE ERECTILE DYSFUNCTION OF ATHLETES BEFORE TRAINING, AFTER 8 -WEEKS TRAINING AND AFTER 12 WEEKS TRAINING

List	Group	Pre-training (N=24)		After week 8th training (N=24)		After weeks 12th training (N=24)		f	p
		M (\bar{x})	S.D.	M (\bar{x})	S.D.	M (\bar{x})	S.D.		
Leg dynamic (kg/kg)	Test	1.80	0.23	1.99a,c	0.34	2.32a,c	0.33	17.289	.001*
	Control	1.72	0.14	1.77	0.14	1.84a	0.15	3.773	.028*
Vertical Jump (cm.)	Test	170.50	7.87	180.70a,c	5.64	194.62a,b	10.77	51.166	.001*
	Control	171.91	6.52	180.33a,c	5.50	186.62a,b	5.24	39.062	.001*
Standing Board Jump(cm.)	Test	190.20	7.99	202.58a,c	8.29	219.50a,b	9.42	70.238	.001*
	Control	190.00	6.31	195.62a	4.58	199.29a	6.08	16.102	.001*

* $p < .05$

a Difference to pre-training

b Different from after Week 8 training

c is different after Week 12.

From Table 2, we found that in the experimental and control groups, after training weeks 8 and 12 differently, when differences were found, the pair tested by Bonferoni's method. After 8 weeks and 12 weeks of training, the experimental group had a higher level of leg muscle performance than before training statistically significant at .05 ($p = .001$). 05 ($p=.001$) Long jump side found that after 8 and 12 weeks of training, the increase was higher than before practice, a statistically significant difference of .05 ($p= .001$) in the control group. However, there was no difference before practice, with the 8-week high jump side after 8 and 12 weeks of training, significantly different from before training. After eight weeks and 12 weeks of training, the difference between before training was statistically significant at .05 ($p=.001$).

TABLE 3
SIGNIFICANCE OF DIFFERENCE IN LEG MUSCLE ERECTILE DYSFUNCTION OF ATHLETES
AFTER 12 WEEKS OF TRAINING

List	Group	After week 12th training		t	p
		M (\bar{x})	S.D.		
Leg dynamic(kg/kg)	Test	2.32	0.33	6.328	.001*
	Control	1.84	0.15		
Vertical Jump(cm.)	Test	194.83	10.77	3.356	.002*
	Control	186.62	5.24		
Standing Board Jump(cm.)	Test	219.50	9.42	8.824	.001*
	Control	199.29	6.08		

*p<.05

From Table 3, after 12 weeks of training, the experimental group to practice leg muscles, leg dynamic was significantly higher than the control group three people significantly different statistical levels.05(p=.001) side, the vertical jump, the experimental group of three people significantly increased significantly higher than the control group statistical level.05(p=.002) standing long jump found that the experimental group and the control group three people were significantly different, a significant statistical level at 05(p=.001)

4. DISCUSSION

Research on the effects of exercise on the ball is on the leg muscle strength of female volleyball players. It was found that weight training on the ball can improve the strength of all leg muscles, which, considering the level of leg muscle strength that female volleyball players undergo, can increase the strength of all leg muscles as follows:

After training 8 and 12 weeks, the experimental group had a statistically significant increase in leg strength at .05 in line with (Boonta Khakai, 2006), which challenged research on the results of the exercise with the Exeter ball and romance share the strength of the back muscles, which was found after the group's post-muscular strength experiment. Unlike statistically significant control groups at .05 points, according to Jarunun Phanggamta, 2009, it is said that muscle fatigue training on the excel ball and floor training on the strength and weakening of the back muscles in gymnastics. It was found that strength training on the exemial ball had a greater percentage of strength and weakness in the back muscles than the ground and control groups, resulting in higher potential volleyball players, resulting in a higher chance of success in competition. When studying the results of heavy strength training in conjunction with the use of the ball, the body can also increase the strength of the leg muscles in line with (Mounir A. & Nermeen F., 2008) found that after practicing with bozuball, the ability to improve the skill of the athletes is consistent with the Saowanee Luangaram, et al. (2011) that the strength training of the athletes will improve. Physical ability reduces the fat accumulated in the body and increases the risk of injury due to sports, increases the strength and density of muscles as well as the ligaments, muscles and bones. In addition, its research (Jaruwat Yodchu, 2008) also shows that the training of core muscles fatigued with the ball off the body and Bosu-ball can develop weakness. Balance of movement, muscle strength Increased muscle endurance (Anderson K & Behm DG, 2005) Because while challenging the experimental group training, the experimental group must try to control the body to balance, as well as training the core muscles (David G. Behm, et al., 2015), which results in improved stability control.(Atle Hole Saeterbakken, 2014; Saeterbakken AH, et al., 2014) says bosuball can develop abdominal muscles, but it depends on proper weight.Conforms (Chaninchai intiraporn, 2001; Vithoon Yamasamit, 2009) the principle that a way to build muscle strength must be to challenge the fight against resistance or heavy

water gradually. It's a good fit for those who need balance, and helps to tighten your muscles. To tighten the back and muscles, it is possible to tighten the ball as the muscles are used to use the power from the inside (Nevin Badr, 2013) to strengthen all parts of the body, with a special emphasis on the back and abdominal muscles. The ball also challenges the support. Specific parts.

Small typency helps with flexibility and strength in combination with challenges in various systems of the body (Chiu-Fang Yan, et al., 2014). The long jump strain was found to be a long jump in the muscle strength of the experimental group, which the research team established to determine the sample sought to challenge the heavy weight at 65% ,75% and 85% of 1RM.Comfoms (Phanuphan Lapratlanathong, 2006; Ministry of Tourism and Sport, 2013; Milić Vladan, et. Al., 2008; Ronnie Lidor, et al., 2010; Zetou E, et al., 2007) training with weight 65% and 85% of 1RM for 12 weeks, resulting in an average leg strength increase.

About experimental group high jump. After training tests in weeks 8 and 12 showed a significant increase in muscle stiffness in the high jump legs. 05, this may be due to the fact that the combination of leg muscle strength training and the use of balls in the body lead to a significant increase in the efficiency of leg muscles. Standing in the high jump soars in accordance with (Stojanović Toplica & Kostić Radmil M., 2002) In addition, during the training program, the researchers were able to practice the same number of muscle groups associated with the muscles associated with the jump. According to (Newton RU, Kraemer WJ, Häkkinen K., 1999)) it was found that off-ball training can develop vertical jumps due to increased muscle strength. Weight training In addition, in the experimental group, it requires the ability to control stability on unstable surfaces. Heavy exercise affects the strength of the leg muscles and the ability of athletes to jump, which is considered vertical jumping. The impact of volleyball skills (Tourism and Sports Department, 2013) leads to jumping skills, so jumping, intercepting or jumping to challenge points increases the likelihood of consistency (John W. Masley, Ara Hairabedian & Donald N. Donaldson, 2013) which requires the strength of the leg muscles in exercise in order to play within a powerful time period. If the athlete has a lot of strength in the leg muscles. Volleyball also has a high potential, which is one of the elements that help volleyball players. Athletes with lower high jump abilities are more likely to challenge scores than high jumpers (Ronnie Lidor and Gal Ziv, 2010) and (Dariusz Mroczek, et al.2017). There is a greater chance of success at higher levels of sporting events.

5. CONCLUSIONS AND RECOMMENDATIONS

Practicing with the weight training program to increase muscle strength on an exercise ball can increase the performance of volleyball players. Have leg muscle performance Strong side, stand up, jump higher and stand a longer jump. Therefore, a weight training program on an exercise ball can be applied to enhance physical fitness, especially leg muscle performance. Depending on the suitability of the equipment, the training facility it also applies to other sports that require the ability of the athlete in leg muscle strength such as volleyball. Basketball Sepaktakraw etc.

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IDENTIFYING PRODUCTS OF THE SPORT INDUSTRY: A CONCEPTUAL ANALYSIS OF SPORT MARKETING

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ABSTRACT

This paper attempts a conceptual analysis of the term 'sport marketing' as found in literature, to present an argument in favour of a modern view of sport as an industrial concern. By employing the theory of economic production, it shows the clear similarities in operational and transactional conducts between sport and other economic industries. Four research questions were answered in an attempt to accentuate the industrial status of sport within the world economy. Clear demarcation was made to distinguish products due directly to sport, from those of other industries used in sport. In the final analysis, core products of the sport industry were identified and distinguished from ancillary to sport which had hitherto been touted as products of sport.

Key words: Economic Production, Sport Marketing, Industry, Sport Equipment, Ancillary to Sport.

1. INTRODUCTION

Sport Marketing as a discipline, has come a long way since it was first mooted in 1978; by the Advertising Age (Fullerton and Mertz, 2008). The concept is now receiving full attention of professional marketers and marketing legends worldwide. This is understandable, considering the meteoric rise in fame of sport as a social phenomenon from the beginning of the twentieth century, coupled with its development into a modern-day economic industry (Humphreys & Ruseski, 2008). Sport is today treated as a sector of the economy notably in the developed world, with quantifiable contribution to national income (Fasandoz, 2016; SportScotland, 2016; European Commission, 2012; Dalziel, 2011). However, defining the concept and thereby creating a clear, distinct span of influence for would be professionals, remains an unresolved issue. A review of notable textbooks in the subject of sport marketing, revealed a near parallel view by scholars (van Heerden, 2001; Fullerton and Mertz, 2008). Sport Marketing is perceived as ambiguous in meaning and in its application among marketing practitioners. Fullerton and Mertz, (2008) observed that existing literature on the subject has inadvertently reduced its application to the sale of tickets for scheduled events, the opportunity for legal gambling, as well as avenue for the sale of products from other industries. The most common view of sport marketing as espoused by many practitioners remain that of a veritable strategy for the marketing of products other than sport itself. In the pursuit of conceptual sanctity, scholars created a dichotomy of marketing activities within the sport industry. Namely, marketing of sport and marketing of non-sport products through sport (Fullerton and Mertz, 2008; Van Heerden, 2003). With this mindset, definition of the concept in literature, tend towards the expected sale of non-sport products, using sport platforms.

While this paper did not attempt a definition of sport marketing, it provides a conceptual framework for the construct, reiterates the place of sport as an industrial concern, and by relying on theories of production, identifies in clear terms core products of the sport industry. Perhaps, a good place to start is to determine what sport really mean. In defining sport, scholars and enthusiasts alike, have stuck to the recreational and health potentials of the phenomenon and do not bother in real terms with its status as an industrial entity (Seippel, 2006; Malm, Jakobsson & Isaksson, 2019; ScienceDaily.com). To explain the term sport, one needs to take into cognisance the transitional path through which the phenomenon probably came into being. Sporting events by their nature seem to have originated, either from spontaneous play or from occupational, and ancient war time activities. These in modern time are watered down to have the effect of leisurely fun. Play are those activities other than occupation, engaged in by man in spontaneous, unplanned and disorganised fashion mainly for fun and relaxation. Where such a spontaneous play is guided by codified and formal rules, to allow for a semblance of competition; a game is produced. When the society gets involved in the development of a game, such that human and material resources are invested to allow for formal organization, control, and institutionalisation of the game, then we have sport. Sport may then be viewed, as institutionalised games, organised formally by the society, to produce controlled competition. It is pertinent to point out here, that strictly controlled competition is the hallmark of the sporting phenomenon. It is distinct from physical activities such as solo running, jogging or weightlifting engaged in to acquire physical fitness. In the same vein, a soccer match played outside the control of a sanctioning body, recognised by the society will not qualify as sport. Hughes, (2008) in proposing a conceptual framework for sport marketing, posited that activities such as dart, billiards and drinking contest cannot be called sport in the true sense of it. This assertion seems erroneous in the sense that

these activities, having been organised into controlled competitions, guided by codified rules and sanctioned by a body recognised by the society are qualified to be called sport.

2. CONCEPTUAL FRAMEWORK

In the final analysis, all products are consequences of operations and processes of industries. The main function of the marketer actually lies in securing patronage for industrial products. The definition of marketing itself is a pointer to this fact. According to the American Marketing Association (AMA), Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large. The exchange of offerings as alluded to here, simply refer to the buying and selling of products and services to customers (See <http://www.marketingpower.com/AboutAMA/Pages/DefinitionofMarketing.aspx>). Philip Kotler defines marketing as “the science and art of exploring, creating, and delivering value to satisfy the needs of a target market at a profit. In the same breath, marketing is to perform the functions of identification of needs and desires as well as definition and measurement of the size of the identified market and the profit potential. It also pinpoints the particular segments the company is capable of serving best in a bid to design and promote the appropriate products and services (See https://kotlermarketing.com/phil_questions.shtml). The design and promotion of products, as well as the offering of same to consumers is the crux of Kotler’s argument. In essence, marketing will not occur except there is an identifiable product for exchange. From the foregoing, sport marketing will become plausible only when products, real or virtual; belonging to sport are identified. This is very important if we are to avoid esoteric conjectures when discussing sport marketing as a concept. Sport marketing as a concept should therefore be viewed as the presentation of products of the sport industry to potential consumers. In defining sport marketing, the status of sport as a productive economic industry must be established. This view is in tandem with Pitts and Stotlar (2002) definition of sport marketing as “the process of designing and implementing activities for the production, pricing, promotion, and distribution of a sport product to satisfy the needs or desires of consumers and to achieve the company’s goals”.

3. METHODOLOGY

This study was designed to among other things, answer the following questions. Is sport as a social phenomenon qualified to be considered an “economic industry?” As an industrial concern, do sport engage factors of production in pursuit of productive activities? Do organised sport involve processes that yield specific products? Are products of the sport industry identifiable and distinguishable from products of other industries? The study proceeded with the following assumptions. As in conventional trade, there are core products of sport as well as products of other industries which are ancillary to sport. Sport is an industry and it produces economic goods. Economic transactions, which would have been illegal under the rule of law, take place in the sporting system. Monetary valuation and exchange of human entities for cash for example, is in essence a commoditisation of human beings in sport. Sport produce both tangible and virtual goods and services which meet the desires of various categories of consumers. This study also assume that some products of the sport industry are quite tangible and easily identifiable. Although some products of sport exist as virtual services, they are not necessarily perishable, and may be demanded in order to generate demand for products of other industries. The apparent misconception as concerning the intangibility and perishability of sport products, as alluded to, notably by Parkhouse (1996), Mullin, Hardy and Sutton (2007); stemmed from the non-industrial view of sport by these eminent scholars at the time of writing their treatise. However, products of the sport industry are not necessarily portable and exist as pseudo-

spiritual entities, leaving consumers with psychedelic utility values. The palpable excitement and near fatalistic cum fanatical believe in the supremacy of one competitor over the other, is a pointer to this fact.

This paper takes an industrial view of sport as a phenomenon, to identify goods and services that are direct consequences of the various processes constituting sport. The goods and services so identified, are classified in this paper as products of sport. All other goods and services often labelled as sport products, are viewed as ancillary to sport.

4. CONCEPT OF SPORT PRODUCTION

Although the economic intricacies surrounding demand and supply of goods and services is beyond the scope of this study, it employed the theory of production, to explain product generation in the sport industry. Production being the chief economic activity engaged in by the society, involves the employment of resources available to a named society to achieve a desired product (Zsuzsanna, 2014). The productive entities that undertake production execution are called industries operating on various scales within the economy. The essential factors of production remain land, labour, capital and entrepreneurship (MacEachern, 2007). These are materials and efforts combined in various degrees to produce goods and services otherwise called economic resources. Factors of production are scarce and are not usually readily available. For the reason of their scarcity, goods and services obtainable are also scarce. This scenario plays out exactly in the sport industry. Sport employs factors of production in various quality and quantity to engage in the production of clearly definable products peculiar to sport as a social phenomenon. Individual societies played entrepreneurial roles at the beginning of the strife for sporting supremacy. This later developed into veiled international struggle for dominance amongst nations espousing different politico-economic views and policies. Sport today plays out as a capitalist venture, thrust out into private ownership of factors of production. All major sporting nations of the world in the modern era, pursue sport policies that favour private dominance of the sporting enterprise. In the same vein, sport governing bodies no longer depend on government subscriptions for survival. Leagues, franchises, clubs and competitions now exist as limited liability companies. The labourers in the sport industry are also identifiable. Teachers, trainers, instructors and coaches and their retinue of backroom staff, form the first line of the labour force while club managers, administrators and governments perform the dual task of management and entrepreneurs. Sporting operations often need ample land space to succeed. Building of various sporting facilities require suitable land and location. Most essentially, sport is a capital-intensive industry requiring in modern time, capital outlays running into hundreds of millions of US dollars. It is pertinent therefore, to expect such companies and enterprises to have products in need of patronage.

4.1 Products of Sport Industry

By exploring the concept of economic production and resource allocation, this paper identifies the core products of the sport industry. Production, is essentially the outcome of processes. Whether it is manufacturing, theatre and arts, agriculture and agro-allied ventures; human and material inputs of prescribed qualities and quantities are employed to engineer industrial outputs of economic value via clearly defined processes. The sport industry in similar fashion, engages human and material resources, passing them through processes that yield economic products. The processes that yield these products are the meticulously planned and executed training programmes, events organisation and management, as well as media hyping. In this wise, sport is an economic industry, exhibiting all features of an industrial concern. However, products of the sport industry exhibit psychedelic utility and value, eliciting in

consumers feelings of often difficult to explain euphoria similar to the type produced in humans by psychedelic drugs. The following are core products of sport industry.

4.2 Athletic Performance

Athletic performance is the first and perhaps the most dominant product of the sport industry. It is the essence of sport competition and what is evaluated directly or indirectly to identify winners or losers in sport competitions. The purchase of tickets by fans in order to gain access to competition venues is actually in exchange for athletic performance. As obtainable in theatres and cinemas, the ticket is not the product being sought by the audience. The actual product is the athletic performance on display. Development of superhuman capacities for the execution of feats that do not occur ordinarily in human beings is an athletic phenomenon. Generation of speed that put cats to shame by humans, making horizontal and vertical jumps that defies gravity, as well as lifting weights far in excess of human endurance capacities are some examples of athletic performance. Attention grabbing athletic performance is therefore the hallmark of the sport industry. The 9.67seconds recorded by Usain Bolt as world record for the 100meters dash in athletics, represents the athletic performance that is sold to spectators at the Olympic Games and similar athletic events where he participated. The high turnout of spectators at the UEFA Champions League soccer matches is predicated upon the expectation of exceptional performances by soccer teams and individual players. Athletic performance is a capacity developed via cognitive and psychomotor training of the organism. It is made up of three interwoven domains of athletic training, namely; techniques, tactics and conditioning. These ingredients, among other things are fused seamlessly together in the production of vintage sport performance. The term fitness as loosely used in the sport industry, actually imply the reinvention of an organism such that it acquires capacities suitable for a defined role. The production firms; usually clubs and federations, engage factors of production e.g. grounds, coaches and trainers, nutritionists, masseurs etc. to activate long term development of Athletic performance (LTDAP); a process that may span decades.

4.3 The Performer/ Athlete

Athletes cannot be treated as a human resource within the sport industry. In actual fact, athletes are the products of another set of human resources. Their work is combined with financial, time and material resources to generate a product capable of measurable industrial standard. All renowned athletes entered as raw inputs of the sport production lines and are made to pass through refining processes that help to develop athletic performance in them. Athletes obviously are products of the sport industry. Athletes such as Bolt, James, Messi, Ronaldo, Hamilton, Woods, Koepka, Federer and the Williams sisters emerged from production processes within the sport industry. Apart from generating fans followership, athletes are often subjects of financial transactions within the sport industry. In some team sport such as soccer and basketball, they are actually bought and sold as commodities. The sale of shirts and other souvenir may be a veritable source of income to sport firms (clubs, associations, federations etc.), however, the same material without club insignias and name of a top performer written across the back will attract limited patronage. By selling branded shirts of a named athlete, the clubs and kits manufacturers sell the performer to the fan and gain financial reward in the process. David Beckham, bought in 2003 from Manchester United and by Real Madrid for about 40 million pounds sterling, generated more than 1 billion pounds in total revenue in his career from branded shirt and shoes sales alone (Miller, 2009). Lionel Messi, Cristiano Ronaldo, Gareth Bale, LeBron James, Rafael Nadal, Anthony Joshua, Tiger Woods represent the cream of the well-known sport performers, whose presence on the sport scene generate huge revenue for the industry.

4.4 Personalities

These include all the larger-than-life characters that sport throw up as social phenomena. Athletes, coaches, administrators, pundits, journalists and other officials who famously star as characters in the never-ending sport drama, are products of the industry. The various endorsement contracts offered by firms of other industries to athletes, could be viewed as buying into an athlete. The sale of image rights and other rights touching the body and name of an athlete, a coach etc. is a clear desire to employ the social image, outlook, temperament etc. of a person to reach target audiences. Like a vehicle purchased in order to facilitate delivery of goods and services, celebrities produced by sport, are purchased to present goods and services in good light to targeted audiences. When Nike, Adidas, Puma, Tommy Hilfiger, American Tourister and other fashion makers invested millions of US dollars in endorsement deals with Michael Jordan, David Beckham, Lionel Messi, Cristiano Ronaldo, Thierry Henry, LeBron James, Anthony Joshua and many others; they bought into their huge personality that have generated huge followership worldwide. Advent of the social media in recent years has made this aspect of sport production more prominent, with some athletes attracting followership in hundreds of millions. Such pool of virtual admirers is a fertile ground for product marketers and explains their choice of sport persons as postal image. This is a direct consequence of production processes within the sport industry.

4.5 Competitions

Competition is another important product of sport as an industry. When the television rights for the English soccer premier league was sold by the English FA for more than 7 billion dollars in 2015 (Ackerman, 2015), an industrial product was exchanged for cash. Sky Sports a television conglomerate that did the actual purchase, then performed the role of a sole distributor in breaking and selling in smaller fractions to sport television channels all over the world who performed the retailing function. The FIFA soccer world cup, the NBA World Series in basketball and the American NFL super bowl, the various tennis grand slams, formula one car racing are all very good example of sport competitions sold and bought by conglomerates from other industries. The 2020 Olympic Games slated for the city of Tokyo, is set to cost Japanese tax payers a whopping 12 billion US dollars; the government in Japan bought a sport product for its tourism value, and global goodwill.

4.6 Contests

One may wonder where the difference lie between contests and competitions. It is also possible to view contests as obvious subsets of a competition. Whereas, competitions in sport, strives to establish superiority over rivals of similar pedigree over time; contests are occasion specific and involves the head-to-head clashes between individual candidates. Competitions in this context, implies the various struggles for supremacy that may last many weeks or months, such as the various soccer leagues, the NFL, NBA, and FIFA world cup. Contests such as the super bowl, Der klassika, and Derby Della Madonnina are usually one match long. Floyd Mayweather fought Connor McGregor, in a crossbred contest between a boxer and a prize fighter. The resultant fight is a product bought by fans and corporate bodies for a staggering 500 million US Dollars in pay per view TV alone (Jabbar, 2019). The much-awaited unification boxing bouts between the trio of Anthony Joshua, Tyson Fury, both of the United Kingdom and Deontay Wilder of the United States is a carefully prepared and meticulously designed product of the sport industry. The goal is to produce contests of monumental status for the pleasure of boxing fans. Sport in its peculiar nature throws up extraordinary contests that sometimes outshine a named competition for which it is a subset. The attempt by American businesses to

take certain matches of the Spanish soccer top division to the United States, cannot be divorced from the desire to stage the contest between FC Barcelona and Real de Madrid in the United States. The *El Clasico*, as it is often tagged, is a separate product in high demand worldwide and as such is distinguishable from the competition *La Liga*. The potential clash between Anthony Joshua and Tyson Fury, for the unification of all four titles on offer in the boxing heavy weight category is touted to generate a staggering 300 million US Dollars in revenue. This is a one-night affair, organised to be distinct from the ever-expanding competition for dominance among boxers in the heavyweight category. One good international example of a sporting contest was the cricket match between India and Pakistan staged at the Old Trafford in Manchester. The competition was the 2019 edition of the Cricket World Cup held in England. Demand for tickets reached a crazy six hundred thousand, for a match billed to hold in a stadium with less than a hundred thousand crowd capacity. The match also generated a worldwide television audience of more than a billion people. The various derbies; whether city, regional, national or international, staged essentially in team sports such as soccer, basketball, cricket, rugby, American football etc., are contests to attain bragging rights in a restricted space. The winner may not win the competition for titles on the long run.

4.7 Crowd

Spectatorship can be safely described as the lifeblood of the sport industry. As observed by Da Silva and La casa, (2017); without game-attending fans, clubs would have problems attracting sponsors. Taylor, (1992) was so effusive about the importance of the crowd, that he described them as the actual currency by which sport is purchased. Although scholars such as Cousens and Slack, (1996) and Mason, (1999) described them as a market segment; the so called “die-hard fans” are products of an industrial culture. Spectators in their thousands and millions, depending on the scope of a sport competition, are the actual target of the sport marketer. The various sponsorship offers made to sport competitions and contests, are veiled transactions made to purchase the crowd, physical and virtual generated at the venue. Since these crowds are direct consequences of the sporting process, they are qualified to be considered products of the sport industry. Coca Cola, did not make the huge financial commitment it has with the International Olympic Committee for the mere love of the Olympics. It is in obvious exchange for Coca Cola products to gain access into the minds and homes of hundreds of thousands of fans at the venues as well as billions of virtual audiences watching on television in far flung places all over the globe.

4.8 Venues

Advertising, an integral part of the marketing process relies on availability of space for visual display, in order to deliver messages that reach large audiences. Sport grounds, parks and stadia are commodious facilities which provide such spaces in no small measure. The naming rights of stadia and sports grounds bought by business conglomerates is an actual purchase of the spaces provided by these sport grounds for unfettered advert placements. Modern day sporting events are televised for worldwide viewership, allowing for worldwide reach of adverts from sport venues. Sport grounds therefore, provide ample space and opportunity for advertisers to reach potential product consumers running into several millions. Stadia used in staging the FIFA world cup, Olympic Games, basketball world series, professional boxing etc. provide such space and opportunity to advertisers. Famous sport grounds all over the world are under various naming rights contracts which sort of purchase the ownership of the grounds for a defined period of time. The Emirates Stadium, Etihad Stadium, Allianz Arena, and Rose bowl are good examples. The cities of London, Paris, Melbourne, Beijing, Dubai etc., in hosting ATP and WTA

events buy into these competitions to enable their name be on display at the venues for the live crowd at the venue, and television audience worldwide.

4.9 Clubs, Associations, Federations etc.

Although sport clubs, associations and federations have been identified as production firms earlier in this discourse; they are also products of the sporting phenomenon. This essentially, is where the concept of branding comes into sport. Sports clubs and sporting associations usually develop overtime into historical monuments similar to rare antiquities. They carry in their names and insignia, brands of nostalgic importance to fans. As in vintage wines, they grow richer with passage of time. Generations of sport fans give their support to a named club or a particular game for reason of city or ancestral affiliation. Others got caught up in a hard to explain love for a club or sport association, based on media hype. The type of revenue declared on annual basis, by associations such as FIFA, FIBA, IOC and IAAF; as well as clubs such as Real Madrid FC, FC Barcelona, Manchester United FC, Los Angeles Lakers, Dallas Cowboys and others; stemmed from unwavering patronage and diehard support for these brands by generations of sport fans. The various sponsorship deals touching names, apparels, facilities etc., of clubs and federations implies the purchase of a preferred brand among many.

4.10 E-Sports

The sport phenomenon has developed beyond strict physical exertions to embrace investment of mental energy in sedentary games. Electronic versions of most sport competitions are now available and are engaged in by professional gamers. Defined as multiplayer video gaming, sport played on electronic devices has taken a competitive turn, attracting professional gamers (Research and Markets, 2020). Although still at its rudimentary stage, esports market growth is really impressive. Revenue in 2019 stands at a healthy 1.1 billion dollars, with sponsorships contributing 667 million dollars (Research and Markets, 2020).

4.11 Ancillary to Sport

Clothing, footwear, headgears, and other equipment used by athletes, games officials or used in the execution of a named sporting event or competition are not direct products of sport in themselves, they are aids to sport. These products have other uses to which they could be put to derive utility from them, where the institution of sport does not exist. A wind cheater jacket bearing the insignia of a sport club does not necessarily belong to sport. The jacket worn by anyone on a cold winter night, will provide protection against cold winds, a utility value needed worldwide.

5.. CONCLUSION

This study was designed to explain the apparent lack of conceptual framework for sport marketing as a discipline. It holds the position that sport is an industrial entity and therefore produce identifiable economic goods. The products so identified are termed core products of sport, while products from other industries utilised in sport are termed ancillary to sport. In this respect it argues that sport marketing as a professional discipline and academic concept must take its bearing from the industrial view of sport focusing on production and product presentation to consumers. It proceeded to identify in clear terms, various definable products of the sport industry. Although numerous products from other sectors of the world economy contribute to the development and successes enjoyed by sport; they are ancillary to sport. Goods such as balls, footwear, apparels, rackets and other equipment employed in the sport industry are sine qua none; nevertheless, they are ancillary to sport.

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**THE IMPACT OF OCCUPATIONAL STRESS AND JOB
SATISFACTION ON PHYSICAL EDUCATION
TEACHERS**

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ABSTRACT

Stress is a very difficult and annoying words in a person's life everybody is a busy in daily life but when this work becomes excessive the great over will be traced and depression comes in their life so she is completely exhausted educational source are those that related to our experience in the world of work career when the immediate solution of many problems is not found and the result of it mental problem arises it is said to be trace this concept arises in a person live when his physical is in danger

Keywords: - education, teachers, impact, depression, Stress, personal Life

1. INTRODUCTION

The word stress is derived from the Latin word strange trace is the wear and Tear our body experience as well adjust to our continually changing in environment it has physical and emotional effect on as and can create positive and negative fitness going to school or into a new job for the first time are some of the stressful situation teaching has become more demanding and intense job it has been identified as one of the profession associated with every high level of occupational stress the relationship of job satisfaction of occupational trays and other negative factors such as intention to leave teaching has been studied in the various circumstances (**Shinde and Anjum, 2007**) has been defined as the experience of negative emotional such as frustration worry and anxiety and depression.

2 CONCEPT OF OCCUPATIONAL STRESS

Stress in human life is related to various factors and it is related to various factors and it is related to Physical mental financial, social etc. Stress is a natural words, stress is not bad in itself. But when stress is created by undeniable outcomes, it becomes distress. The concept arises is the person life when his physical and mental danger. There are many sources for circumstance of stress. when a problem arises suddenly is one life, that strays is created is we take an example of a Teacher's their job is to teach student however it can be very stressful and something can be challenging physical education teaching is considered as one of the most stressful job in their days become the modern was in the fall of stress (**Champlain, 1995**). Stress is a feeling of physical and emotional tension.

Job shun is a particular is the inability to cope with the pressure is a job. Teacher stress is a specific something can be challenging. Teaching is considered as are of the most stressful job is there day because the modern words is full of stress.

3 INDIVIDUAL ATTRIBUTED FACTORS

These are so many factors influencing stress and there are individual factors, which as follow.

3.1. Family Problems

Family issue in the personal life of individual sound material relationship, mortal discipline and healthy children lead to happy personal life of individuals who are made marital discipline and healthy children's lead to happy personal life of individuals for mental relationship, problematic children's finally separation, early death of sports or other family members are some of the reasons for greater stress as an individual(**Agarwal, 2004**).

3.2 Economical problem

Economic difference equation is the main causes of stress. Poor management of personal finance heavy family explained constant demand for money, poor income early capacity and slow fitness growth is once job are some of the economic reasons responsible for greater stress (**Anitha, 2006**).

4. ORGANIZATIONAL FACTORS

4.1 Working condition

Working condition and stress are inversely related employers is poor working environment are subjected to greater stress. Some of the working condition the lead to more strays are crowded work stress, noise, heat, polluted air etc. (**Ausekar, 1996**).

4.2 Organizational Task

Organizational task are designed to meet objective and goal poorly design task lead to greater stress. Task autonomy task interdisciplinary task demand and task overload are some of the

factors of organizational task become potential reasons for stress if not properly designed (Armstrong, 2006).

5. ENVIRONMENTAL FACTORS

5.1 Social, cultural and environmental

Social factor influence the lifestyle of employees certain social measures such as health protection, civil facilities and social groups reduce stress in the employees. Certain sociological variable such as Race 6 social class Gender and cultural factors such as benefits customs and traditional are potential test actors (Bahari, 2003).

5.2 Economic and Political

This encompasses income level, demand and supply ect. Change is these factors make new demands on the both organization and employees. This creates stress if the employees are unable to adjust to the new situation. For instance it increase influence level create pressure on employees income level leading to stress. Every political party that forms the Government. Wishes to either enact new laws and regulations are bring change in the existing ones (Chandreshwari, 2013).

5.3 Impact of Job Satisfaction

Job Satisfaction is the combination of two words “Job and Satisfaction” Job satisfaction is an occupational activity perform by an individual is turns for a rewards, satisfaction refers to the way one felts about events people things job satisfaction concept has come from industrial psychology and it is now one of the most explored concept. Several job elements contribute to job satisfaction. The most essential amongst them are wage structure, nature of works, promotion changes and quality of separation group and working condition (Dixit, 1986).

5.4 Auxiliary components of job satisfaction

Physical education teacher from many factors while doing their job as follows. **5.4.1 6.**

PROMOTION

Promotional opportunities influence job considerably. The desire for promotion is greatly strong among employees as it involves change in the job content, pays, responsibility, independence status and the likes. An average employees and a typical government organizational can hope to get two or three promotion in his entire service, thongs chance of promotion are better in the private sector (George and Jones, 2005).

6.1 Wedges

Wages play a very important role in influencing job satisfaction; as a result of reasons.. First money is an important instrument is fulfilling one’s need and two employees often see pay as a replication of management concern for them. Teachers want a pay stress, which is simple, fair and is line with their expectation. When play is seen as based on job demand, and individual skill level and commonly play standards, satisfaction is likely result (Gupta and Gehlawat, 2013).

6.2 Nature of works

Most of teachers need intellectual challenges on Jobs. They tend to desire being give opportunity to use their skills and ability to bring offered a variety of task freedom and feedback on how will they are doing. These characteristics makes job mentally challenging (Gupta and Joshi, 2014).

7. WORK GROUP

The work group provides as a source of Satisfaction to individual teachers. It does so, chiefly by providing group members, with opportunities for arias. Education provided on opportunity to develop one's personality. It enhances individual wisdom, visualization, judgment,

understanding and common sense. Highly educated teachers' posers' persistence, rotationally and thinking power. They can understand a situation and a prices it positively (**Ahmed, Abdal and Sajid, 2003**). They are likely to express satisfaction with the jobs.

All of the above supporting factors help to teachers in the physical education to the find job satisfaction.

8. CONCLUSION

This conclusion ultimately leads to the conclusion that job stress and satisfaction depends on the effectiveness of their work. More work and less time increase the likelihood job stress. Job satisfaction of teachers is to improvement because their attitude towards. Job affect the learning process of the student only satisfied teachers can perform well in the classrooms and ground and their quality of teaching improve they become more industries and show greater amount of commitment to the teaching- learning process.

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ASSESSMENT OF PSYCHOLOGICAL WELL BEING OF SCHOOL CHILDREN

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ABSTRACT

Six Hundred Twenty Seven school children (298 boys and 329 girls) ranging 13 to 18 years of age were assessed for Psychological Well-being. Using Psychological Well-being scale by Singh and Choudhary, (2012). This scale consists of five dimensions viz. satisfaction, efficiency, sociability, mental health and interpersonal relations. Data collected were subjected to descriptive statistics (mean and standard deviation), MANOVA followed by ANOVA, followed by Least Significance Difference test of Post-Hoc analysis. Descriptive Analysis of data revealed that Psychological Well-being of boys and girls of age 13 to 18 years was at moderate level. Psychological Well-being of girls of age 17 years, (Efficiency) and boys of age 15 years, 17 years and 18 years have higher Interpersonal Relations. A multivariate analysis of variance to determine the effect of age and gender on psychological well-being and its sub factors. The indicated significant main effects of age and gender as Wilks' Lambda = .817, $F(25, 2271) = 5.074$; .953, $F(5, 611) = 5.24$, for age and gender respectively were significant at .05 level. Analysis of variance with respect to gender revealed that boys and girls of 13 to 18 years of age differ significantly on efficiency, sociability and mental health. The differences on satisfaction and interpersonal relation were statistically insignificant. Further, one way Analysis of variance according to age revealed that there was significant difference on efficiency, sociability and mental health and interpersonal relations. Whereas the mean differences on satisfaction among these age groups was statistically insignificant at 0.05 level.

Key Words: Psychological Well-being and school children.

1. INTRODUCTION

Psychological well-being is combination of feeling good and functioning effectively for well going life. Sustainable psychological well-being does not mean individual to always feel good; the painful emotions (grief, failure and disappointment) is part of normal life. For long term well-being it is essential to manage these negative emotions within the limits. When the negative emotions are extreme and very long lasting then psychological well-being is compromised which affects the person's ability to function in his or her daily life. The idea of functioning effectively leads to the development of one's life having some control over one's life having a sense of fulfillments of purpose and enjoying positive relationship (Felicia, 2009).

The people with high happiness and well-being have attribution style that are more self-enhancing and more enabling compare to those low in psychological well-being. The positive emotions lead to positive cognition which, in turn, develops positive emotions (Ryan and Deci, 2001). People who experience positive emotions evaluate themselves and others more positively to show more confident, optimistic and generous way in interpersonal situation (Forgas, 2002).

High psychological well-being like (life satisfaction, absence of negative emotions, optimism and positive emotions) cause better health and survival. The key characteristic of good life is dependent on good cultures in which these flourish (Edgerton, 1992). Positive mind set is related to protective psychological and behavioral aspects like greater social connectedness, optimism, perceived social support and preference for adoptive and coping responses. The positive mind set is also associated with exercising regularly, not smoking and a prudent diet (Steptoe, Docksay and Wardle, 2009). Psychological well-being is consistently and positively related with measure of physical health. Moreover levels of psychological well-being tend to change over the life span (Ryff, Singer and Love, 2004). There has been concern with why and how people experience their life in positive ways for both cognitive judgments and affective reaction. For such study diverse terms as happiness, satisfaction, morale and positive effect have been used. It is concluded that happy person comes out as young, healthy, well paid, well-educated, religious, extroverted, and optimistic, with high self-esteem and a wide range of intelligence (Wilsons, 1967). Rutter (1979) indicated that emotional disturbance during adolescence is somewhat higher than observed during childhood or later adult life. The brain activation of child development is reported to have appearance of differences patterns. The purpose of present investigation was to assess psychological well-being of 13 yeras to 18 years old school going children.

2. METHODS AND MATERIALS

2.1 Subjects

Six Hundred Twenty Seven (298 male and 329 female) children from 13 to 18 years of age were randomly selected as subjects of the study. These children were selected from Government and Private schools of Jabalpur district of Madhya Pradesh.

2.2 Measures

The Psychological Well-being was evaluated using Psychological Well-being scale given by Sisodia and Choudhary, (2012) and published by National Psychological Corporation Agra. This scale has five sub sections with ten questions in each sub section and accordingly the scale comprises of total fifty questions. The sub sections are Satisfaction, Efficiency, Sociability, Mental Health and Interpersonal Relations. Participants were asked to accurately indicate their responses to each item on the 5 point likert scale from 1, strongly disagree and 5, strongly agree.

2.3 Measures

Data on Psychological well-being and its sub scale were subjected to descriptive analysis (Mean and Standard Deviation), ANOVA and followed by Least Significance Difference (LSD) Test of Post-hoc analysis were used.

3. RESULTS AND DISCUSSION

To find out the significance of differences between means of various dimensions of Psychological well-being among boys and girls children of M.P mean, SD, ANOVA was computed. Data pertaining to these analyses have been presented in table 1 to 8.

TABLE 1
DESCRIPTIVE STATISTICS OF PSYCHOLOGICAL WELL-BEING OF BOYS AND GIRLS OF THIRTEEN TO EIGHTEEN YEARS OF AGE.

Variables	Sex	13 Years		14 Years		15 Years		16 Years		17 Years		18 Years	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Satisfaction	M	39.46	6.68	39.58	7.90	40.44	4.99	38.24	6.25	39.54	5.56	40.55	6.91
	F	38.20	4.82	39.23	5.38	39.98	4.42	40.68	4.59	41.77	4.35	40.29	4.58
Efficiency	M	39.42	5.45	37.41	9.08	41.92	4.74	39.68	6.60	41.14	4.51	41.81	6.50
	F	40.18	5.64	39.98	5.02	40.57	5.18	41.56	3.13	43.54	3.51	41.64	4.32
Sociability	M	38.42	5.91	37.25	7.65	42.40	5.02	40.44	6.78	40.06	7.34	40.83	9.53
	F	39.78	6.77	37.58	4.99	39.26	5.55	37.48	6.02	37.60	4.51	41.47	5.99
Mental Health	M	37.74	7.04	36.68	8.93	42.04	6.19	40.18	4.89	40.18	6.75	42.95	6.29
	F	38.73	5.77	36.31	6.92	39.07	6.64	37.24	6.38	39.66	7.02	41.18	5.62
Interpersonal Relation	M	37.82	7.31	39.09	7.10	44.14	6.68	40.94	6.10	43.81	6.29	43.65	6.59
	F	38.59	5.88	39.70	6.01	40.82	6.93	41.50	5.78	42.14	4.54	42.50	3.73
Total Psychological Well-being	M	192.82	24.32	190.04	36.04	210.94	19.85	199.48	25.00	204.75	24.36	209.82	30.71
	F	195.50	20.76	192.82	21.21	199.73	20.95	198.46	18.00	204.73	14.26	207.10	14.93

The data in on Psychological Well-being for boys and girls in table-1 indicated that the children of 13 to 18 years age group have moderate level (16 to 43)of Satisfaction, Efficiency, Sociability, Mental health and Interpersonal relation. Where as, the girls at 17 years had higher level of Efficiency, and boys at 15 years, 17 years and 18 years had higher level of interpersonal relations (43 to 48). Subsequently univariate tests were conducted for age and gender with measures of Psychological Well-being and their sub factors as dependent variables. Data pertaining to this has been presented in table 2 to 7.

A multivariate analysis of variance determine the effect of age and gender on psychological well-being and its sub factors. The indicated significant main effects of age and gender as Wilks' Lambda= .817, F (25, 2271) =5.074; .953, F (5,611)=5.24, for age and gender respectively were significant at .05 level.

TABLE 2

ANALYSIS OF VARIANCE ON DIFFERENT MEASURES OF PSYCHOLOGICAL WELL-BEING OF BOYS AND GIRLS OF THIRTEEN TO EIGHTEEN YEARS OF AGE

Factor	Variables	Source of variance	df	Sum of Squares	Mean of Square	F-value
Gender	Satisfaction	Between groups	1	23.658	23.658	.746
		Within group	615	19497.049	31.703	
	Efficiency	Between groups	1	160.344	160.344	5.244*
		Within group	615	18803.062	30.574	
	Sociability	Between groups	1	166.452	166.452	4.005*
		Within group	615	25563.098	41.566	
	Mental health	Between groups	1	246.953	246.953	5.656*
		Within group	615	26852.825	43.663	
	Interpersonal Relations	Between groups	1	75.778	75.778	1.991
		Within group	615	23404.533	38.056	

*Significant at .05 level. $F_{.05(5,615)}=3.04$

Analysis of data in table-2 revealed that boys and girls differ on three out of five measures of Psychological Well-being viz. Efficiency, Sociability and Mental Health where as, the mean difference on Satisfaction and Interpersonal relations sub factor of Psychological Well-being, among these age groups was statistically insignificant at .05 levels.

TABLE 3

ANALYSIS OF VARIANCE ON DIFFERENT MEASURES OF PSYCHOLOGICAL WELL-BEING OF BOYS AND GIRLS OF THIRTEEN TO EIGHTEEN YEARS OF AGE

Factor	Variables	Source of variance	df	Sum of Squares	Mean of Square	F-value
Age	Satisfaction	Between groups	5	259.150	51.830	1.635
		Within group	615	19497.049	31.703	
	Efficiency	Between groups	5	946.904	189.381	6.194*
		Within group	615	18803.062	30.574	
	Sociability	Between groups	5	1021.411	204.282	4.915*
		Within group	615	25563.098	41.566	
	Mental health	Between groups	5	2011.787	402.357	9.215*
		Within group	615	26852.825	43.663	
	Interpersonal Relations	Between groups	5	2189.131	437.826	11.505*
		Within group	615	23404.533	38.056	

*Significant at .05 level, $F_{.05(5,615)}=3.04$

The analysis of variance data in table-3 showed that boys and girls of 13 to 18 years of age differ significantly on Efficiency, Sociability, Mental Health and Interpersonal relations, sub factors of Psychological Well-being. Whereas, the mean difference on Satisfaction sub factor of Psychological Well-being, among these age groups was statistically insignificant at .05 levels.

In case of significant F-ratios on Efficiency, Sociability, Mental Health and Inter Personal relation Least Significance Difference of Post-hoc comparisons was used to find out the significant of difference between ordered paired means of different age groups on these factors and the data pertaining to this has been presented in table 4 to 8.

TABLE 4
SIGNIFICANCE OF DIFFERENCES BETWEEN ORDERED PAIRED MEANS OF EFFICIENCY-A SUB FACTOR OF PSYCHOLOGICAL WELL-BEING OF BOYS AND GIRLS OF THIRTEEN TO EIGHTEEN YEARS

13 years	14 years	15 years	16 years	17 years	18 years	MD	C.I.
39.85	38.87					0.98	1.45
39.85		41.23				-1.38	1.50
39.85			40.62			-0.77	1.51
39.85				42.34		-2.49*	1.53
39.85					41.73	-1.88*	1.52
	38.87	41.23				-2.36*	1.49
	38.87		40.62			-1.75*	1.50
	38.87			42.34		-3.47*	1.52
	38.87				41.73	-2.86*	1.51
		41.23	40.62			0.61	1.55
		41.23		42.34		-1.11	1.57
		41.23			41.73	-0.5	1.56
			40.62	42.34		-1.72*	1.58
			40.62		41.73	-1.11	1.57
				42.34	41.73	0.61	1.59

*Significant at .05 level.

Analysis of data on Efficiency in table-4 revealed significant differences between mean scores of 13 and 17 years (2.49), between 13 and 18 years (1.88); between 14 and 15 years (2.36), between 14 and 16 years (1.75), between 14 and 17 years (3.47), between 14 and 18 years (2.86); and between 16 and 17 years (1.72).

Whereas, the mean difference between mean scores of 13 and 14 years (0.98), between 13 and 15 years (1.38), between 13 and 16 years (0.77); between 16 and 17 years (0.61) between 15 and 17 years (1.11), between 15 and 18 years (0.5); between 16 and 18 years (1.11); and between 17 and 18 years (0.61) were insignificant, as the mean difference were less than the required least significant values it to be significant at .05 levels.

TABLE 5
SIGNIFICANCE OF DIFFERENCES BETWEEN ORDERED PAIRED MEANS OF SOCIABILITY, -A SUB FACTOR OF PSYCHOLOGICAL WELL-BEING OF BOYS AND GIRLS OF 13 TO 17 YEARS

13 years	14 years	15 years	16 years	17 years	18 years	MD	C.I.
39.18	37.44					1.74*	1.66
39.18		40.8				-1.62	1.72
39.18			38.96			0.22	1.73
39.18				38.83		0.35	1.75
39.18					41.15	-1.97*	1.75
	37.44	40.8				-3.36*	1.71
	37.44		38.96			-1.52	1.72
	37.44			38.83		-1.39	1.74
	37.44				41.15	-3.71*	1.73
		40.8	38.96			1.84*	1.78
		40.8		38.83		1.97*	1.80
		40.8			41.15	-0.35	1.79
			38.96	38.83		0.13	1.81
			38.96		41.15	-2.19*	1.80
				38.83	41.15	-2.32*	1.82

*Significant at .05 level.

Analysis of data on Sociability in table-5 indicated significant difference between mean scores of 13 and 14 years (1.74), between 13 and 18 years (1.97); between 14 and 15 years (3.36), between 14 and 18 years (3.71); between 15 and 16 (1.84), between 15 to 18 (1.97); between 16 and 18 years (2.19) and between 17 and 18 years (2.32). Whereas, the mean difference between mean scores of between 13 and 15 years (1.62), between 13 and 16 years (0.22), between 13 and 17 years (0.35); between 14 and 16 years (1.52), between 14 and 17 years (1.39); between 15 and 18 years (0.35); and between 16 and 17 years (1.13) were insignificant, as the mean difference were less than therequired least significant valuesit to be significant at .05 levels.

TABLE 6
SIGNIFICANCE OF DIFFERENCES BETWEEN ORDERED PAIRED MEANS OF
MENTAL HEALTH -A SUB, FACTOR OF PSYCHOLOGICAL WELL-BEING
OF BOYS AND GIRLS OF THIRTEEN TO EIGHTEEN YEARS

13 years	14 years	15 years	16 years	17 years	18 years	MD	C.I.
38.29	36.47					1.82*	1.70
38.29		40.52				-2.23*	1.77
38.29			38.71			-0.42	1.78
38.29				39.92		-1.63	1.80
38.29					42.08	-3.79*	1.79
	36.47	40.52				-4.05*	1.75
	36.47		38.71			-2.24*	1.76
	36.47			39.92		-3.45*	1.78
	36.47				42.08	-5.61*	1.78
		40.52	38.71			1.81	1.82
		40.52		39.92		0.6	1.84
		40.52			42.08	-1.56	1.84
			38.71	39.92		-1.21	1.85
			38.71		42.08	-3.37*	1.85
				39.92	42.08	-2.16*	1.87

*Significant at .05 level.

Analysis of data in table-6 revealed that there is significant difference on Mental health between mean scores of 13 and 14 years (1.82), between 13 and 15 years (2.23), between 13 and 18 years (3.79); between 14 and 15 years (4.05), between 14 and 16 years (2.24), between 14 and 17 years (3.45), between 14 and 18 years (5.61); between 16 and 18 years (3.37) and between 17 and 18 years (2.16). Whereas, the mean difference between mean score of between 13 and 16 years (0.42), between 13 and 17 years (1.63); between and 15 and 16 years (1.81), between and 16 years (0.6) and between 15 and 18 years (1.56) were insignificant, as the mean difference were less than the required least significant value sit to be significant at .05 levels.

TABLE 7
SIGNIFICANCE OF DIFFERENCES BETWEEN ORDERED PAIRED MEANS OF
INTERPERSONAL RELATIONS -A SUB, FACTOR OF PSYCHOLOGICAL
WELL-BEING OF BOYS AND GIRLS OF THIRTEEN TO
EIGHTEEN YEARS

13 years	14 years	15 years	16 years	17 years	18 years	MD	C.I.
38.25	39.44					-1.19	1.59
38.25		42.45				-4.2*	1.65
38.25			41.22			-2.97*	1.66
38.25				42.97		-4.72*	1.68
38.25					43.08	-4.83*	1.67
	39.44	42.45				-3.01*	1.64
	39.44		41.22			-1.78*	1.65
	39.44			42.97		-3.53*	1.67
	39.44				43.08	-3.64*	1.66
		42.45	41.22			1.23	1.70
		42.45		42.97		-0.52	1.72
		42.45			43.08	-0.63	1.72
			41.22	42.97		-1.75*	1.73
			41.22		43.08	-1.86*	1.73
				42.97	43.08	-0.11	1.74

*Significant at .05 level.

Analysis of data on interpersonal relations in table-7 revealed significant difference between mean scores of 13 and 15 years(4.2), between 13 and 16 years(2.97), between 13 and 17 years (4.72), between 13 and 18 years (4.83); between 14 and 15 years (3.01), between 14 and 16 years (1.78), between 14 and 17 years(3.53), between 14 and 18 years(3.64); between 16 and 17 years(1.75), and between 16 and 18 years(1.86).

Whereas the mean difference between mean scores of 13 and 14 years (1.19); between 14 and 15 years (1.23), between 15 and 17 years (0.52), between 15 and 18 years (0.63); and between 17 and 18 years (0.11) were insignificant, as the mean difference were less than the required least significant values to be significant at .05 levels.

TABLE 8
SIGNIFICANCE OF DIFFERENCES BETWEEN ORDERED PAIRED MEANS OF
TOTAL SCORE OF PSYCHOLOGICAL WELL-BEING OF BOYS AND GIRLS OF
THIRTEEN TO EIGHTEEN YEARS

13 years	14 years	15 years	16 years	17 years	18 years	MD	C.I.
194.34	191.62					2.72	5.98
194.34		205.23				-10.89*	6.22
194.34			198.97			-4.63	6.25
194.34				204.74		-10.4*	6.32
194.34					208.47	-14.13*	6.30
	191.62	205.23				-13.61*	6.17
	191.62		198.97			-7.35*	6.20
	191.62			204.74		-13.12*	6.27
	191.62				208.47	-16.85*	6.25
		205.23	198.97			6.26	6.42
		205.23		204.74		0.49	6.49
		205.23			208.47	-3.24	6.47
			198.97	204.74		-5.77	6.51
			198.97		208.47	-9.5*	6.50
				204.74	208.47	-3.73	6.57

Significant at .05 level.

Analysis of data on psychological well-being as whole in table -8 revealed significant differences between mean scores of 13 and 15 years (10.89), between 13 and 17 years (10.4), between 13 and 18 years (14.13); between 14 and 15 years (13.61), between 14 and 16 years (7.35), between 14 and 17 years (13.12), between 14 and 18 years (16.85) and between 16 and 18 years (9.5).

4. DISCUSSION

The results of descriptive analysis indicated the moderate level Satisfaction, Efficiency, Sociability, Mental health and Interpersonal relation among male children of 13 to 18 years age. Where as, the girls at seventeen years had higher level of Efficiency and boys at fifteen, seventeen and eighteen years had higher level of interpersonal relations.

A multivariate analysis of variance indicated the significant main effects of age and gender as Wilks' Lambda= .817, F (25, 2271) =5.074; .953, F (5,611)=5.24, for age and gender respectively were significant.

To find out the significance of differences between gender of various age groups on five sub-factors of psychological well-being, Analysis of variance indicated the the significant differences among gender on three out of five measures of Psychological Well-being viz. Efficiency, Sociability and Mental Health where as, the mean difference on Satisfaction and Interpersonal relations sub factor of Psychological Well-being, among these age groups was statistically insignificant.

To find out the significance of differences among gender and age on five sub-factors of psychological well-being, F-ratio resulted significant differences among boys and girls of 13 to 18 years of age on Efficiency, Sociability, Mental Health and insignificant. Differences on Interpersonal relations, sub factors of Psychological Well-being.

To find out the significant of difference between ordered paired means of different age groups on these factors Least Significance Difference of Post-hoc comparisons expressed the significant variations among various age groups male and female children on on five sub-factors of psychological well-being

5. CONCLUSIONS

Within the limitation of the current study following conclusions were drawn:

1. Boys of 13 to 18 years age have moderate level of Psychological Well-being.
2. Girls of 13 to 18 years age have moderate level of Psychological Well-being.
3. Gender wise psychological well-being of girls of age groups 13 years and 14 years was higher than the boys of same age groups. Whereas, Psychological Well-being of boys of age groups 15 years, 16 years, 17 years and 18 years is higher than the groups of corresponding age groups.
4. Psychological well-being of boys and girls of 13 to 18 years has age wise variation. Initially the psychological well-being has declined in the age of 14 years when compared to 13 years of age. In the age groups of 15 years, it improved and again declined in the age groups of 16 years. Thereafter 17 years and 18 years of age groups have shown improvement in the Psychological well-being.
5. Gender wise analysis of variance data revealed that boys and girls differ on three out of five measures of Psychological Well-being viz. efficiency, sociability, and mental health. The mean difference on satisfaction and interpersonal relations a sub factor of psychological well-being among boys and girls was statistically insignificant at .05 level.
6. Age wise analysis of variance data of Psychological Well-being children 13 to 18 years of age revealed that they differ significantly on efficiency, sociability, mental health and interpersonal relations, sub factors of psychological well-being. The mean difference on satisfaction, sub factors of psychological well-being among age groups was statistically insignificant at .05 level.
7. Overall boys and girls of age groups 13 to 18 years of age have moderate level Psychological Well-being.

6. SUGGESTION

The results of this study suggest that a comprehensive approach and programmed is needs to be evolved and implemented for improving Psychological Well-being of school going children.

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**INFLUENCE OF CROSS TRAINING ON SELECTED
BOI-MOTER ABILITIES AND PHYSIOLOGICAL
VARIABLES AMONG HOCKEY
PLAYERS**

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ABSTRACT

The purpose of the study was to find out the Influence of cross training on selected bio-motor abilities and physiological variables among hockey players. To achieve the purpose of the present study, thirty hockey players those who are studying in intercollegiate hockey players, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into two equal groups of fifteen subjects each. Group I acted as Experimental Group I (cross training), and Group II acted as Control Group. The duration of experimental period was 6 weeks. Analysis of Covariance (ANCOVA) and scheffe's post hoc test was used. Consisting of Jumping jacks, high knees, lunges, butt kicks, burpees, plank, skaters, legs down, skiers and the control group was not provided with any investigational treatment. Initial scores on selected bio-motor, physiological variables, abdominal strength endurance, resting hart rate of the subjects were collected using standard tests. The results proved those six weeks cross training significantly improved bio-motor, physiological variables. It was concluded that cross training can be imparted to intercollegiate level hockey players.

Key words: Training, Jumping, High knees, Lunges, Butt kicks, Burpees, Plank, Skaters, Skiers.

1. INTRODUCTION

Researchers have proved that adding an alternative mode of Cross-training in sports and fitness involves combining exercises to work various parts of the body. Often one particular activity works certain muscle groups, but not others; cross-training aims to eliminate this imbalance.

Cross training is a concept that allows for higher volumes of training without overtraining specific tissues of the body. Repeatedly performing the same movement increases one's risk for overtraining and developing muscular imbalances. Cross training can assist in significantly boosting running performance by reducing running injuries, increasing running efficiency, increasing caloric expenditure, and even improving the body's ability to regulate temperature during training and racing.

In contrast, if cross training is not executed properly, it may hurt performance or the runner themselves by increasing their vulnerability to injury or infection. The greater volume of endurance training also results in a larger volume of plasma retained in the blood. This increased blood volume further enhances the capacity to deliver oxygen to working muscles. Additionally, the increased extra cellular fluid associated with larger plasma volume can be used to help regulate body temperature during intense training by increasing the body's evaporative cooling potential. The increased blood volume will also help preserve hydration during training and racing.

Cross-training effects never exceed those induced by the sport-specific training mode. The principles of specificity of training tend to have greater significance, especially for highly trained athletes. For the general population, cross-training may be highly beneficial in terms of overall fitness. Similarly, cross-training may be an appropriate supplement during rehabilitation periods from physical injury and during periods of overtraining (**Tanaka, 2012**).

Quinn (2019) explained that cross-training is simply a training routine that involves several different types of exercise. This works more muscle groups, improves agility, and makes it easier to participate in a variety of recreational sports, like skiing. In addition, cross-training reduces exercise boredom, which many people find helps to keep them motivated.

All types of sports decreased the RHR. However, only endurance training and yoga significantly decreased the RHR in both sexes. The exercise-induced decreases of RHR were positively related with the pre-interventional RHR and negatively with the average age of the participants. From this, we can conclude that exercise—especially endurance training and yoga—decreases RHR. This effect may contribute to a reduction in all-cause mortality due to regular exercise or sports (**Reimers, Knapp, and Reimers, 2018**)

Fitness and strength come in many different forms, so mixing and matching your exercises will help improve power and efficiency, by mixing a variety of cardio, strength and stretching into your workout regime you'll be working a mix of muscles and ensuring overall fitness (<https://www.coachmag.co.uk/fitness/7028/five-benefits-of-cross-training>)

The cross training contribute to the increased performance, It Improves Your fitness, prevent injury, It improves posture and co-ordination, It boosts mental strength and recover faster among the experimental group (**Nick , 2020**).

2. METHODOLOGY

Pre and post-test random group research design was followed in this study. The selected subjects, 30 intercollegiate level hockey players were randomly divided into two groups. One group formed experimental group and the other group was control group. The experimental group was given cross training for six weeks, consisting of Jumping jacks, high knees, lunges,

butt kicks, burpees, plank, skaters, legs down, skiers and the control group was not provided with any experimental treatment. Initial scores on selected bio-motor and physiological variables, Abdominal Strength Endurance, Resting hart rate of the subjects were collected using standard tests. After the experimental period of six weeks, the subjects were again tested on selected. The difference between initial and final scores formed the effect of cross training on selected criterion variables. The obtained data were subjected to statistical analysis using Analysis of Covariance (ANCOVA).

3. RESULTS

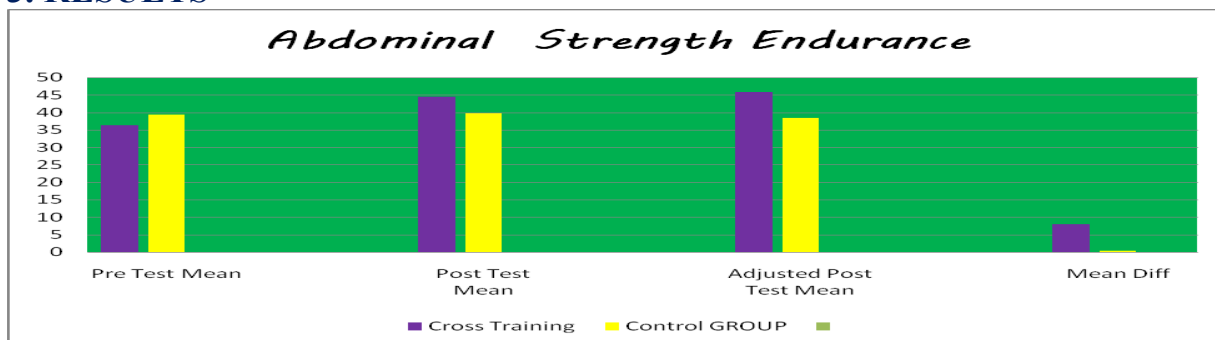


Fig.1 : Treatment effects on different stages

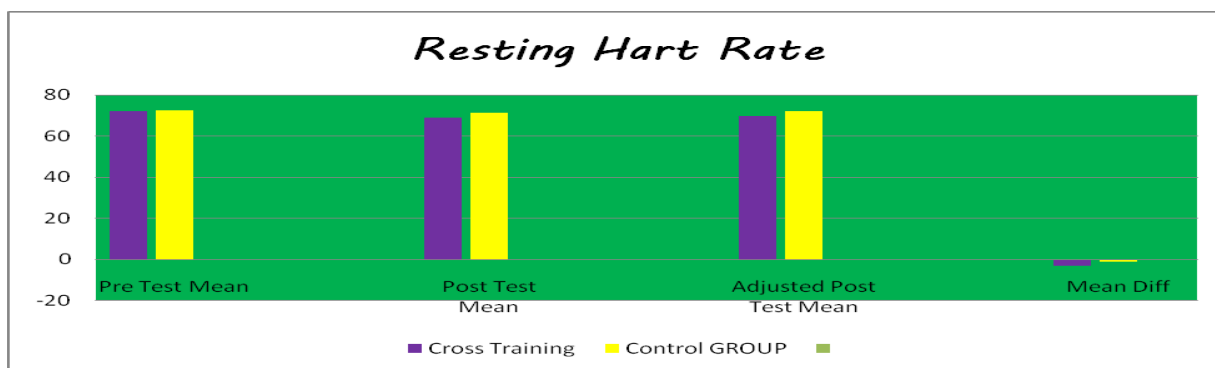


Fig.2 : Treatment effects on different stages

Table 1: Result of analysis of covariance on the bio-motor variables between Experimental and Control group - Abdominal strength endurance							
	Cross Training	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	36.33	39.27	Between	64.53	1	64.53	2.38
			Within	760.27	28	27.15	
Post Test Mean	44.40	39.73	Between	163.33	1	163.33	5.48*
			Within	834.53	28	29.48	
Adjusted Post Test Mean	45.83	38.31	Between	391.16	1	391.16	92.54*
			Within	114.13	27	4.23	
Mean Diff	8.07	0.46					

Table 2: Result of analysis of covariance on the physiological variables between Experimental and Control group - Resting hart rate							
	Cross Training	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	72.19	72.31	Between	0.30	1	0.30	0.412
			Within	20.4	28	0.729	
Post Test Mean	69.07	71.24	Between	17.63	1	17.63	21.396*
			Within	23.07	28	0.824	
Adjusted Post Test Mean	69.81	72.07	Between	22.11	1	22.11	172.73*
			Within	3.46	27	0.128	
Mean Diff	-3.1	-1.07					

Table F-ratio at 0.05 level of confidence for 1 and 28 (df) =4.01, 1 and 27(df) =4.01 Indicate significance of values at P=0.05, respectively

4. DISSCUSSION

The results presented in Table 1 and 2 proved that six weeks interval cross training significantly improved the bio-motor and physiological variable Abdominal Strength Endurance, Resting hart rate. In this study, the cross training, namely, Jumping jacks, high knees, lunges, butt kicks, burpees, plank, skaters, legs down, Skiers were given for six weeks. The number of repetitions the individual was able to sustain for different pause durations and the intensities used in this study, enabled the experimental group subjects to absorb the changes in maximal dynamic power during successive exercise periods which resulted in associated metabolic changes in muscle, which resulted the experimental group to improve the bio-motor and physiological variables, Abdominal strength endurance, resting hart rate, significantly than the control group which was not provided with these cross training. The results of this study are in Agreement with the findings of **Harris et al. (2008)**.

5. CONCLUSION

The results of this one study clearly indicated that cross training sessions with different work to rest ratios have different energy demands. The muscular power to develop anaerobic capacity, improved with cross training however, bio-motor, physiological, abdominal strength endurance, resting hart rate showed a significant improvement in this study. Hence, hockey players of intercollegiate level can be safely underwent cross training whenever needed.

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INNOVATION IN SPORTS TECHNOLOGY

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ABSTRACT

Today in the age of technology and technology being used in various fields and human beings have no choice but to dose sport and exercise science like have been affected greatly by technological advancements it is difficult to imagine modern sports and various sub disciplines of exercise science technology. The area of technology in sports in growing rapidly astral explain in an example of the resemble technology being used in sports today.

Keywords: - Sports, Technology, Games, Advanced, Performance, Football, Athletes, Impact.

Key Words – Physiotherapy , Intralesional Corticosteroid injections , Categorized

1. INTRODUCTION

Today's technology is based on the level of innovation of scientist thoughts technology is being used in the fields of sports in recent times the use of technology is without exception tainted with frustration and ambivalence indeed in five of sports technology has profoundly changed the landscape of sports and exercise science in the past games were played for entertainment in time it became more professional, and gradually (**Barr, 2016**).

Now days with the advent of professionalism in modern sports technology based innovation is being used there for the important of has increased globally. In the 21st century impale people than even before are participating in sports Accordingly forms UN secretary-general Kofi anon, sports has rally become a universal language, beginning people together, neater what there sign back ground religious selfish or economic status with their technology, officials are abet to see exactly what happened providing a second perspective on sports events in stand replay in used on games like crick as football reify success and ever in combat sorts (**Bartett, 1997**).

2. TYPES OF SPORTS TECHNOLOGY

Technology is changing the face of modern sports, sports psychology and coaching state of the are technologies are used to optimize performance is sports or diverse as cyclamen speed skating gets, swimming tennis summing and many more technology in sport to days in ground in countless forms with each innovation has potentially positive and biotical outcomes.

2.1 Database Technologies

To days world in totally depend on database technology it involves computer innovations that allows athletes and coaches to know everything they need to know about their opponents and themselves. Database programmers have greatly affected the way that many and most professional coaches and plays do their business (**Kumar, 2001**). It's called information feedback technology their technology allow individual inflates to continuously track their progress on impact physical and performance Pass at. Even when not training for Olympic gold medal technology can play a positive and separating role, helping people to get motivated the large humors of computer technology biosocial entering new materials and energy technology.

2.2 Self Steno gist

Self Technologies economics other of athletic innovation's of which are also controversial other include surgical procedures bionic limbs, sport psychological introversion and generic engineering are all classified as self – technologies. This represents the most obvious and disbudding for many people from the technology due to the potential of fund mentally and other errantly after an athletic physical energy goal being made up (**Happen, 1996**).

2.3 Rehabilitative Technology

There are sub stands and procedures used to treat moderate serve injuries makeup rehabilitative technologies they also include medicine used by healthy athletic who just wants country the athletics debilitating effects of their training regiments particularly these technologies are located in sports climates and draining facilities and are administered by sealifts in athletic training or sports medicine (**Levlinson, 1996**).

2.4 Movement Technologies

It refers to their devices and procedures that are designed to assess the form and efficiency of an athletics body he from an efficiency of an athletics body the most concern of such include vitiate analysis although those Rae scientific dictated instruments that provide me mild encrypts rod in for mention any athletes' biome hens on life the ether form of technology movement technologies also often net visible within the competitive arena (**Vanessa, 2019**).

Besides helping to improve another existing technique, the data yielded by movement techniques may also facilitate conceptual or stylistic shifts that allow the athlete to compete in a mechanically, aesthetically and kinesthetically novel manner.

2.5 Landscape technologies

This form of technology involves the sporting environments which include the way spectators watch sport events. Prominent landscape technology is the increases of modern multipurpose sport complexes with jumbo torn screen retractable domes soaring corners, monde tracks and artificial grass. **Bates (1996)** Argues that modern athletes have an intimate relationship with the technological sporting landscapes Track and field athletes are new tactics because they can monitor their competitors on the jumbo trans coming down in the home stretch (**Chris Edmund son, 2014**).

2.6 Implement Technologies

It includes equipment that athletes use or that the kick, very or otherwise prophet. Other examples include football soccer helmets. Equipped with warning devices and radios, shark rules that allow smirk the move affluently slice through the water and high tech running shock clubs and rockets the interesting arms very involving these kinds of technologies the use of fish finding computers in sport flirting (**Bata, 1996**).

3. IMPORTANCE OF TECHNOLOGY IN SPORT

Every technology gives good result every fields advances in technology have has a profound impact on sport including of sport performance and enabling coasts to greatly improve the quality of feedback to players / athletes increase their economy in time measurements of sport performance

Technology has been fundamental actors in the life of human beings for many years To has invaded practically all the areas of our day with the purpose of give it to us almost everything. Sports in not a field that escapes the constant technologically advances that everyday try detect our way of practicing it (**Toffler,1971**). The technological advances related to trademark registration are more than striking. It is instanced to reach the highest possible accuracy, to fine-tune to the thousandth of a second to such an extent that, we can perfectly different who has won a sliming race technology has a great blame for sues the famous. Hawks Eye mot helps us to see the winner of any type of sake but also has adapted to tennis to see when a most comes out or when the ball enters cooingly into the soccer global (**Tarry, 1990**).

Technology in most professional sport has been using instant replay to assist the references and umpires football have been using instant replay for any certain accession and basketball references are the instant replays to make sure the time is right for rich game now with the technology different sports are engaging in the instant replay such as soccer with the goal technology.

4. CONCLUSION

A sport as a special social phenomenon has become a modern technology accessories. The world of sports is changing because of technology. In our life technology plays large role in daily lives if also play a large role in changing the body thus, technology plays continues to change the way sports are played, how injuries are treated who kinds of sports and played and enhances performances outcomes.

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GLOBALIZATION AND SPORTS

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ABSTRACT

Today in the age of globalization as a result, the whole world has come closer, which has changed the social economic and political cycle of the whole world, globalization politically affected information and technological advancements in sports education institutions and increased many opportunities to use information based technologies in the instruction process. It is important to consider that the biggest effect of globalization a sports education institution comprises more increased use of the internet and technological devices.

Keywords: - Globalization, Sports, Sports – Strategy, Technology, Physical Education.

Keyword: Physical Fitness, Athletes, Track and Field Events

1. INTRODUCTION

Today's game in a modern game. These games are not limited to our country but have become international in nature globalization of sports refers to the process of expansion of the idea of sports across 21st century was influenced by the process of globalization (Beyer P 1994) Now days, sports and sportsperson have gained global importance every country is safe guarding its foreign interests through various sports Organizing international sports competitions is a great example of globalization. The international federations, international world cup associations, and common wealth country competitions are example of globalization in sport, and globalization is a process of social political. Ecumenical and cultural changes that culminates in improvement of relations and more interaction and mingling in the world globalization not only imports the way in which sports are conducted and organized but also has they are perceived and what they mean today's world (Fisman, 1996).

2. CHANGING NATURE OF SPORTS

Sports have been very important since ancient times. The nature of sports changed from traditional games to modern games. It is important to play sports to keep the body strong and healthy changes are sports can reflect global change. Globalization can impact or a national sport. Because of globalization and commercialization the value of a certain sports in very often determined by the size of available audience for media Advertisers and sponsors. Kerry(2002) The route of modern sports can Britain and United States where first professional sports were organized in mining industrial town and cities. First signs of globalization in that matters appeared because of the global hegemonic position mat great Britain had in the nineteenth century in fact, the globalization of sports began with the modern Olympics games were organized in its ancient birthplace of Athens and athlete's from fourteen nations (Catherine, 2012)

After the founded intertribal federation of association football (FIFA) others European associations joined and by 1909 FIFA was consisted only from nations of the "old continent" Lattes on globalization of sports was fated by the expansion of technology and the introduction of commercial aspects to sports. On one hand newspaper, radio and especially television as audience, or the others commercial advertising allowed to profit from them (Desbordes, Aymar & Hautbois, 2019).

3. IMPACT OF GLOBALIZATION ON SPORTS

Modern sports are bound up in a global network of interdependency chains that are marked by global flows and then power relations. Consider the consummation of sports events, the global flows that pattern world sports have several dimensions. These include the international movement of propel such as tourists, migrants, exiles and gust workers the technology dimension in created by the flow between countries of the machinery and equipment produced by corporations and government agencies the economic dimensions center's on the repaid flow of money and its equivalents around the world, the media dimension entails the flow of images and information between countries that in produced and distributed by newspaper, magazines, radio, liar, television, satellite, video and the world wide web and finally, the ideological dimensions in linked to the flow of values centrally associated with state or counters state ideologies and movements (Thikault, 2009). Thus the global migration of sports personal has been a pronounced features of recent decadent.

The next impost of globalization this concept refers to the growing network of independence economic political cultural and social which bind human beings together for better and for worse we can also note that globalization process are recent origin and nor do they

occur every across all area of the globe. These processes invading an increasing intensification of global inter-connectors are very long term in nature but doing the twentieth century the rate of changes gathered momentum (Guha, 2002). These process include the emergence of a global economy a transnational cosmopolitan culture and arrange of international social movement a multitude of transnational or global economic and technological exchanges, communication networks and migratory characterize this interconnected world looter Regarding economic issues, clearly the flow of finance in the global sports area has come to entre not only on the international trade in personal prize money and endorsement, but on the marketing to sport along specific lines (Sen, 2015).

The global sports system accordingly involves the mechanisms of production experience and consumption achievement sport involvers the identification and development of talent its production on a global stage, in a single or multi – sport event and its consummation by direct spectators or through the media complex a global moss audience, Traced over time there in a tendency towards the emergency of a global achievements sports monoculture a culture where administrators coaches and teachers promote and foster achievement. Sports values and ideologies and where conventions and tournaments are structured along highly commoditized and rationalized lines (Kidane, 2001). We can see the media – sports production complex project images of individual sports labor migrants, treasure forms and specific cultural massage to large global ardencies consider the world-wide audience for the many Olympic Games. The power of this media sport complex has forced a range of sports to align themselves to this global model that emphasize spectacle, personality and excitement the importance of sports has increased in the world and it has created its places in the global commercial market (Boria Majumdar, 2017).

4. CONCLUSION

Sports have been given special status since ancient times and it has gained commercial importance in modern times due to its globalization. Different games are played all over the world. Each game has different characteristics and has gained commercial importance sport program growth and development which pays attention to globalization could maintain the national values. It is important and suggested that in future planning after policy makes pay attention toward social needs, universal arid should also take in to consideration.

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**BENEFITS OF PERSONALITY DEVELOPEMNT AND
PHYSICAL FITNESS THROUGH THE GAME OF
BALL BADMINTON:A BRIEF REVIEW**

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ABSTRACT

Ball badminton is a native Indian sport and is a gift from the British. Ball badminton was one of the games played by British when they were in power in India. The main game in India is played in south India. The game has attracted many players from southern in India. Playing this game has a positive effect on the players and their physical fitness, the game now gaining recognition globally. It is great body toning workout it involves a lot of physical activity between the running lunging divide and wall hitting playing this game burns fat and increase fitness of player. It frequently can help increase level of physical fitness playing the game improve coordination flexibility and balance because of the agility. Ball badminton from physical fitness it helps to reduce stress and anxiety as with all forms of physical exercise. It can reduce health problem such as high blood pressure diabetes and obesity. Playing this game keeps your intelligent sharp and process positively with great power comes.

Keywords:-Ball Badminton, , Players, Benefits, Physical Fitness, Personality

1. INTRODUCTION

Every sport is a good for human health and their physical fitness. God gives us positive positively life and everyone should be take benefit from them. Ball badminton originated in India and in a gift from the British, according to some Scholars this game originated in India, countries ago and was later spread to England and then to other parts of the world. Ball badminton is a racket game, played with yellow ball made of wool, on a court of fixed dimensions divided by net. The game was played an early an 1856 by Royal family is Tanjore in Tamilnadu, India. It enjoys the greatest popularity in India. Ball badminton is a combination of speed in rallies and endurance to allow sustained efforts and to promote recovery between 'rallies. Great strength, agility, power, flexibility, are also required all of these fitness. Component should form part of players fitness (Reddy, 2012).

1.1 Nature of Ball Badminton Game

Ball badminton game originated is Tanjore, in Tamilnadu. It became popular commanding the interest of the Maharaja of Tanjore. The game has attracted many players from southern India. Previously ball badminton was an attractive game for ruler boys. Since is required a minimum of equipment. The game drew eloper number of student from South India, result in the formation of the ball badminton federation of India in 1954 (**BBF Website-2010**).

These are benefits common to all Sports. Ball badminton in the perfect sport for health enthusiasts and one heading in that direction, playing a sport has a lot of benefits and two of them in that increase your endurance and stamina. You Gets it as you play and as you need and opponent or a partner there's a highly social element, which creator commitment two playing and a feel- good factor afterwards, ball badminton in is a game in which you struggle hard to get stamina better than a football player hand stronger than a volleyball smash, core strength more than a basketball player, wrist strongest than squash player and agility higher than a table tennis player.

It is fun and exciting sport to pick up if you're looking for an activity that boosts your physical mental, and social aspects of health.(BBF website,2010).There are benefits common to all sports. Ball badminton is the perfect sports for health enthusiasts and one heading is that direction, playing a sport has a lot of benefits and two of them is that increase your endurance and stamens, you get fitter as play, and as you need and opponent or a partner threes a highly social elements. Which creates commitment of playing and a feel- good facture afterwards? Boll badminton is a game is which you struggle hard to get stamina better than a football player hand stronger than a volleyball Smasher, core strength more than a basket ball player ,wrist stronger than a squash player. It is fun and exciting sport to pick up if yours looking for on activity that boosts your physical mental and social aspects of health (**BBF website,2010**).

1.2 Advantages of Ball Badminton

There are so many benefits from the ball badminton and they are good for player personality and physical fitness.

1.3 Good physical fitness

Ball badminton is great body toning workout it involves a lot of physical activity between the running lunging divide and wall hitting playing ball badminton burns fat at approximately 500 calorie per hour in feet 2 to day match professional players run the equivalent of 1 mil so if you start playing ball badminton roughly can help you shade as much as four closing month because of its fat burning and metabolism boosting quality badminton help you to control your weight (**Singh,2001**).

1.4 Develops athleticism

The another benefits of ball badminton increase the speed improve reflex dividing the level of athleticism in the body weighing ball badminton frequently can help increase your level of physical fitness playing the game improve coordination flexibility and balance because of the agility that's required to am correctly and moved to the heat the bride when it comes to your side and the course (Singh, 2005).

1.5 Social health remains good

You cannot play ball badminton on your own you will need at least one upon and but you can also play with a team mate and two other opponent's the social interaction of the game will result in positive feeling after the season on the court it will give you a reason to interact with other people of course it takes more than 1 game to get all of which benefits you have to roughly play the game of you to notice the improvement when you are playing at the ball badminton courts make sure you are having fun with other players. (Siddhartha and Yenyan, 1986)

1.6 Physical benefits

Ball badminton from physical fitness it helps to reduce stress and anxiety as with all forms of physical exercise badminton can reduce health problem such as high blood pressure diabetes and obesity if you are someone who has a very busy routine and the result in excessive trace then you need to square 15 to 30 minutes of your daily time and play ball badminton it is a very in Ten Sport and physical exertion the extra physical activity helps to keep your mind relaxed and unlimited trace on your body (Kamlesh,1991))

1.7 Improve in intellectual ability

Playing ball badminton keeps your intelligent sharp and process positively with great power comes great responsibility and with the ball badminton you will develop lightning need quick reflexes ball badminton is the fastest sport and hence you need to respond quick you need to quickly Swift to reach the shuttle and mentally a guide to work out where to move written it and how so hit it so we the combined agility of mind and body will advance your ability to process throw and accurately e develop a plan of action both on the off the course the fact that one needs to response quickly requires high level of contraction (Grice, 1996).

1.8 Gets inspiration and encouragement

Ball badminton play must play not only with their hands but also the their brains Denis study to weakness of the opponent then it to comes out with the right strategy to heat the opponent's therefore the keep exercise their brain and the will make players to keep send most of the time as a result of all the health benefits ball badminton is for you will have a letter sleep you will feel more as you and perform better of your daily tasks moreover being physically fit and having highly brain function will help you focus better than feel good all the time (Gold, 2016).

2. CONCLUSION

To conclude there are so many good impact and benefits of the sport badminton from building strength balance coordination to improving fitness and reducing the risk of illness therefore if you are looking to get a great workout that is both fans and optimize your physical and mental performance its perfect time to start playing ball badminton.

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A STUDY TO ASSESS THE EFFECT OF PETTLEP IMAGERY TRAINING ON PENALTY FLICK PERFORMANCE WITH PERSON PRESSURE CONDITION AFTER DIFFERENT TRAINING DURATIONS ON DIFFERENT TRAINING GROUPS

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ABSTRACT

To achieve the aim of the present research, a purposive sample of sixty National and Inter-University level male Hockey players of 18-25 years in age was randomly divided into four groups. Pre-test and post-test random group design was employed, groups were assigned to three experimental groups and a control group. The experimental groups along with regular hockey practice group 'A' received imagery training once per week (1x/wk), group 'B' received twice per week (2x/wk), group 'C' received three times per week (3x/wk) and the control group participated in regular routine practice. The experiment continued for twelve weeks. The penalty flick performance with person pressure condition was evaluated after six weeks, nine weeks and finally at twelve weeks at the end of experiment.. ANCOVA was used to determine the significance of difference among mean scores of different training groups and control group after different training durations and Repeated measures analysis of variance was used to find out the significance of difference among mean scores of different training durations of different training frequency groups. Results on analysis of effect of PETTLEP imagery training with various training frequencies per week for different durations revealed that neither training frequency per week nor duration of training produced significant improvement in penalty flick performance of hockey players. As the obtained F-ratio of 1.44,1.409,0.913 and 0.186 were less than the required F-ratio 2.83 to be significant at 0.05 level

Key Words: Imagery training, National, Inter-university, Levels, Hockey, Players, Person Pressure.

1. INTRODUCTION

Imagery within the context of sports is also thought of as “a creation or recreation of an expertise generated from memorial data, involving quasi-sensorial, quasi-perceptual and quasi-effective characteristics, that's willing management of the imager and which can occur within the absence of the important input antecedents ordinarily related to the particular experience” (Morriss, Pittle and Watt, 2005).

A sensory or perceptual experience that is produced if an external stimulus is not directly related to imagery. Imagery can involve visual, tactile, auditory, emotional, muscular, olfactory and gustatory experience (Loehr, 1986).

The purpose of Anuar, et. al. (2016) was to see that whether the physical and environment elements of PETTLEP imagery relate to the ability to image five kinds of sport imagery (i.e., skill, strategy, goal, affect, and mastery). 290 (Males=152, , 148 Females=148) with mean and SD of age (20.24 ±4.36) years of participants from various sports completed the Sport Imagery Ability Questionnaire (SIAQ). The best fitting physical and environment elements significantly and positively predicted imagery ability of the different imagery types i.e. skill; strategy, goal, affect, and mastery. The model was a good fit to the data, $\chi^2(174) = 263.87$, $p < .001$, CFI = .96, TLI = .95, SRMR = .09, RMSEA = 0.05 (90% CI = 0.03 – 0.05). Research has shown that prime imagery is associated with improved ability, strategies, objectives, impact and imaging skills with physical and environment components.

Phillip, G Post, et. al. (2015) examined the consequences of a four-week PETTLEP representational process intervention on learners' talent acquisition of a standing long jump. seventy six female students. M±SD of age of scholars was 20.6 ±1.77). They were allotted into one in all four groups: physical practice, mental imagery and physical practice, mental imagery observe, or a control cluster. The study conducted among pre-test, intervention, and a post-test. throughout the intervention part the PP cluster completed eighty physical jumps; information processing + PP cluster completed forty imaged and forty physical jumps; the information processing cluster completed eighty imaged jumps; and also the CON cluster engaged in an exceedingly distraction task. Results discovered that the PP and information processing + PP teams outperformed the CON cluster on the post-test. From pre to post, the PP and information processing + PP teams improved, the information processing cluster maintained performance, and CON cluster attenuated in performance. within the intervention and post-test stages, all coaching teams reportable considerably higher efforts / significance ratings compared with the CON cluster for the IMI. Results extend previous study by showing that imaging combined with physical practise will profit the training of a complex motor task which solely imaging will facilitate students retain their initial skills

Afrouzeh, et.al.(2020) compared the results of physical practice with PETTLEP-based on Physical, Environmental, Tasks, Timing, Learning, feeling and Perspective (Holmes & Collins, 2001) imaging, as well as physical practice with ancient imaging interventions, on new talent learning in novice volleyball players. cardinal novice male volleyball players with six – eight months apply expertise were at random allotted to 1 of 3 groups: [physical practice + PETTLEP imaging (n=12), physical apply + ancient imaging (n=12), and physical follow solely (control group; n=12). PETTLEP mental process. Cluster respondents have applied the seven parts of PETTLEP imagery coaching, whereas ancient imagination process on cluster respondents participated during a relaxation session before imagery and motor imagery scripts were loaded. the 2 teams took quarter-hour of imaging coaching and were quickly followed thrice weekly by 13 minutes of "passing." thrice weekly exercise was drained the management cluster simply

thirteen minutes. For seven weeks, every cluster fulfils its obligations. throughout the primary practice, a pre-test was command, during which passing was evaluated. The post-test followed by a pretest and posttest, a 'no practice' week later, preceded the seven weeks of apply. From pre- to post-test and retention tests all teams improved considerably ($p < 0.05$). The cluster PETTLEP, however, improved higher than the normal cluster of physical and imaging ($p < 0.05$) once hypothesized. The results additionally support the potency of PETTLEP in mix with physical apply in up the educational and performance of latest skills.

The purpose of Wakefield and Smith (2011) study was to look at the results of differing frequencies of PETTLEP mental imagery on bicep curl performance, employing a single-case style. Following a baseline amount, participants completed PETTLEP mental imagery 1x/week, 2x/week, or 3x/week in a very balanced pattern. it absolutely was found that PETTLEP mental imagery exhibited positive impact on performance. additionally, because the frequency of images will increase, a bigger performance impact was apparent. Findings square measure in per PETTLEP mental imagery that will cause strength gains if performed a minimum of 1x per week, however that finishing mental imagery additional oft is also more practical.

The purpose of Swainston (2011) study was to analyze the impact that a PETTLEP mental imagery intervention enforced into a pre shot routine had on a full swing golf stroke. one subjects style was used with 3 conditions: mental imagery before pre shot routine, mental imagery once pre shot routine and an impact condition. Participants were 9 college man volunteers with a mean age of nineteen.3 years and a mean golf score of eighty two.1. 3 sets of knowledge were recorded: total score, balls in A1 (the nighest space to the pin in a very standardized rating target grid), and balls in A5 (anything outside of the grid). it absolutely was found that participants improved all mental imagery from baseline to intervention all told 3 aspects. Whereas, management cluster induced decreases in performance. mental imagery had the additional impact on performance for balls hit in A-five. Implications from the study could profit golfers of any ability level and sport science Consultants operating with golfers World Health Organization need to extend their full swing shot accuracy.

2. METHODOLOGY

2.1 Sample

To achieve the purpose of the present research, a purposive sample of sixty National and Inter-University level male Hockey players of 18-25 years in age was randomly divided into four groups.

2.2 Design

In the present study the pre-test and post-test random group design was employed, groups were assigned to three experimental groups and a control group.

2.3 Tools

The Movement Imagery Questionnaire - Revised (MIQ-R) by **Hall & Martin (1997)** was administered to assess the status of Visual and Kinesthetic Imagery of all subjects.

2.4 Statistical Analysis

RM ANOVA was used to determine the significance of difference among mean scores of different training groups and control group after different training durations and Repeated measures analysis of variance was used to find out the significance of difference among mean scores of different training durations of different training frequency groups.

3. RESULTS

TABLE 1
REPEATED MEASURES ANALYSIS OF VARIANCE OF PENALTY FLICK
PERFORMANCE WITH PERSON PRESSURE CONDITION AFTER
DIFFERENT TRAINING DURATIONS ON DIFFERENT
TRAINING GROUPS

S.NO.	Training program	Source of Variance	Sum of Square	DF	Mean Squares	F-ratio
1	One Day/week	Between groups	208.867	3	69.622	1.14
		Within groups	2555.133	42	60.836	
2	Thrice /week	Between groups	30859.33	3	1029.778	1.41
		Within groups	30678.67	42	730.444	
3	Three Times/week	Between groups	95.533	3	31.844	0.91
		Within groups	1464.467	42	34.868	

Insignificant at 0.05 level

$$F_{0.05} = (3,42) = 2.83$$

Analysis of penalty flick performance data, it is evident from table-18 that the different training frequency groups person pressure data of different training durations as a one day per week (1x/wk) group, twice a week (2x/wk) group, three times per week (3x/wk) group and control group did not showed statistically significant difference.

The obtained f-ratio of 1.44, 1.409, 0.913 and 0.186 were less than the required F-ratio 2.83 to be significant at 0.05 level.

Analysis of effect of PETTLEP imagery training with person pressure condition with various training frequencies per week for different durations in table-18 revealed that neither training frequency per week nor duration of training produced significant improvement in penalty flick performance of hockey players.

4. DISCUSSION

PETTLEP imagery training with various training frequencies per week for different durations revealed that neither training frequency per week nor duration of training produced significant improvement in penalty flick performance of hockey players. Analysis of penalty flick performance with person pressure condition (with dummy goalkeeper) PETTLEP imagery training with different frequencies groups of different training durations indicate, as a one day per week (1x/wk) group, twice a week (2x/wk) group, three times per week (3x/wk) group and control group did not showed statistically significant difference.

5. CONCLUSION

Analysis of effect of PETTLEP imagery training with various training frequencies per week for different durations revealed that neither training frequency per week nor duration of training produced significant improvement in penalty flick performance of hockey players.

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A STUDY TO ASSESS THE EFFECT OF PETTLEP IMAGERY TRAINING ON PENALTY FLICK PERFORMANCE WITH TIME PRESSURE CONDITION AFTER DIFFERENT TRAINING DURATIONS ON DIFFERENT TRAINING GROUPS

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ABSTRACT

To achieve the purpose of the present research, a purposive sample of sixty National and Inter-University level male Hockey players of 18-25 years in age was randomly divided into four groups. Pre-test and post-test random group design was employed, groups were assigned to three experimental groups and a control group. The experimental groups along with regular hockey practice group 'A' received imagery training once per week (1x/wk), group 'B' received twice per week (2x/wk), group 'C' received three times per week (3x/wk) and the control group participated in regular routine practice. The experiment continued for twelve weeks. The penalty flick performance was evaluated after six weeks, nine weeks and finally at twelve weeks at the end of experiment. On average, the hockey players had at least 3 years playing experienced without previous training in imagery. ANCOVA was used to determine the significance of difference among mean scores of different training groups and control group after different training durations and Repeated measures analysis of variance was used to find out the significance of difference among mean scores of different training durations of different training frequency groups. Results indicated that PETTLEP imagery training for one day per week has no significant effect on hockey players performance. In twice a week PETTLEP imagery training, PETTLEP imagery training given twice a week for twelve weeks is quite effective in improving Penalty flick hockey performance of a player. PETTLEP imagery training with time pressure condition training three days per week for twelve weeks give better results than training for nine weeks.

Key Words: Hockey, Player, Time pressure, national, Inter-university, Levels, Imagery

1. INTRODUCTION

Imagery is widespread among all sports, from the grassroots level to the personalities of professional sportsmen. As for example Brazilian footballer Ronaldinho, uses imagery for game planning and game planning purposes.

Vealey & Greenleaf in 2001 defined the imagery as the using all the senses to create or recreate an experience in the mind. **Garza & Feltz, in 1998 and Post & Wrisberg in 2012** expressed that imagery is a psychological technique that has proven its effectiveness in sport by influencing psychological states positively, such as lowering fear and improving self-confidence, self-efficacy and attention. According to **Thelwell & Maynard in 2002 and White & Hardy in 1995 explained that** imagery is useful as a coping mechanism, retaining current skills and evaluating previous performances.

The purpose of Cherappurath et. al. (2020) was to analyzed the performance of tennis service of players which was based on PETTLEP imagery training. For the study, 44 junior male tennis players were chosen ($M_{age}=13.22$ years of age, $SD=0.42$). The researcher distributed the MIQ-R questionnaire among all the participants , where they obtained 16 and more points in accordance with prior studies. The participants were grouped equally ($n=11$) into three test groups and a control group (E1, E2 and E3). Pre and post training session, the performance results of all actors were compared. For three days a week for 12 weeks, the three study groups were assigned with service training, service-specific training and imagery training combined with PETTLEP imaging training and PETTLEP imagery training alone. Their accuracy was evaluated on the basis of the international tennis number (ITN) on-court evaluation manual. The data have been evaluated for normality and analysed with non-parametric techniques to detect primary effects (every training method alone) and to quantify PETTLEP's combined effects and relevant training. Special service-specific training alone showed some notable changes in tennis services. While PETTLEP imaging was only slightly better, PETTLEP and service-specific training used together were the most improved services. This suggests a supplementary effect if both techniques are used in combination.

Lingvall (2019) discussed the imagery means and describe different theories of imagery. Mental imagery, performance, and brain plasticity in sport are not being investigated. The study of healthy people and patient studies using MI was carried out to increase performance and examine changes in the brain to respond to the latter focus of this thesis. This thesis is aimed at carrying out a review of the literature. The results show that MI in combination with PP will increase the performance of sport. It was also seen. Most studies have concluded that MI and PP can lead to plasticity in the brain and no evidence has been discovered in only one study. It also demonstrated that MI alone can lead to development of the brain. Future studies should cover greater samples, corresponding topics and the comparison of MI effects in many sports.

McNeil, (2019) studied the reactive agility effects of imagery training and whether imagery may increase reaction to unexpected stimuli. 47 female athletes have been randomly assigned to either a three-week training, imagery or control condition ($M_{age} = 21.51$, $SD = 2.32$). Physical training requires the physical testing of the reactionary agility task, when imaging the stimulus present and executing the reactive agility job is the imagery training condition. There was no reactive agility training for the control condition. In order to assess improvements in the reactive performance of the training interventions, a mixed-model MANOVA (3 training conditions) x 7 (reactive agility performing compounds) was completed. Physical training enhanced decision-making time and reactive agility overall. Imaging trainings have enhanced time for stimulus decision and foot stimulation, but not overall reactive agility performance.

Control group did not have any improvement in performance. Findings support the imagery use in light stimulation reactive agility achievement for decision time variable. The lack of an overall improvement in reactive performance may show that imagery training is not successful for all perceptive motor performance components. Inconsistencies in the performance change appear to suggest that during imaging participants may not have created unexpected stimuli. Future research is necessary to determine whether image enhancements translate into reactive tasks for sport.

Baughman (2017) evaluated the shrinking gap in literature by analyzing the effect on short 30-yard shot. The attendees were 5 proficient (average score > 100) male golfers.. A single-subject design was implemented: ABA (baseline, intervention, return-to-baseline). The research took place on a local golf course for a 5-week period. Every golfer tried 20 shots from a distance of 30 metres. Imaging capabilities were measured with the MIQ-R Movement Imagery Questionnaire and the Ability to Motivate Imagery in Sport (MIAMS). Visual inspection and graphs evaluate the efficiency of the short shot imagery intervention. Five out of five participants from baseline to intervention showed changes in pin accuracy. It was hypothesized that the use of a PETTLEP imagery intervention may improve golfer's short-shot accuracy to the pin, as well as imagery ability may increase across stages. The results showed a reduction in accuracy in 4 out of 5 participants. During the intervention, two participants out of five improved their imaging ability. Mean and variability changes were also assessed with impact dimensions, and indicated that during the intervention phase, two out of every five participants differed less. The research has implications, especially when used in pre-existing routine, to emphasize the effect of PETTLEP imagery on golf performance. The results indicate that the practice of PETTLEP imagery helps to improve accuracy and imagery.

2. METHODOLOGY

2.1. Sample of Study

To achieve the purpose of the present research, a purposive sample of sixty National and Inter-University level male Hockey players of 18-25 years in age was randomly divided into four groups.

2.2 Research Design

In the present study the pre-test and post-test random group design was employed, groups were assigned to three experimental groups and a control group.

2.3 Tool Used

The Movement Imagery Questionnaire - Revised (MIQ-R) by **Hall & Martin (1997)** was administered to assess the status of Visual and Kinesthetic Imagery of all subjects.

2.4 Statistical Analysis

RM ANOVA was used to determine the significance of difference among mean scores of different training groups and control group after different training durations and Repeated measures analysis of variance was used to find out the significance of difference among mean scores of different training durations of different training frequency groups.

3. RESULTS

To find out the significant differences penalty flick performance with time pressure condition at different training duration on different groups, repeated measure ANOVA was applied and data pertaining to this, has been presented in Table 1 to 3.

TABLE – 1
REPEATED MEASURES ANALYSIS OF VARIANCE OF PENALTY FLICK PERFORMANCE WITH TIME PRESSURE CONDITION AFTER DIFFERENT TRAINING DURATIONS ON DIFFERENT TRAINING GROUPS

S.NO.	Training Frequency	Source of Variance	Sum of Square	DF	Mean Squares	F-ratio
1	One Day/week	Between groups	555.917	3	185.305	2.814*
		Within groups	2765.333	42	65.841	
2	Thrice /week	Between groups	1116.716	3	372.239	6.054*
		Within groups	2582.533	42	61.489	
3	Three Times/week	Between groups	1496.45	3	498.317	12.506*
		Within groups	1675.8	42	39.9	

* Significant at 0.05, $F_{05}(3,42) = 2.83$

It is evident from table-19 that the different training frequency groups with time pressure data at different training durations as twice per week training group (2x/wk) and three times per week training group (3x/wk) differ significantly. The obtained f-ratio of 6.054 and 12.50 were higher than the required f-ratio 2.83 to be significant at 0.05 level.

The data on penalty flick performance of hockey player at various training frequencies of PETTLEP imagery training with time pressure condition after different training durations in table-19 revealed that one day per week training has no significant effect on hockey players performance as the obtained F-ratio of 2.814 is less than the required F-ratio 2.83 to be significant at 0.05 level.

Whereas in case of twice per week training and three times a week for the penalty flick performance improved significantly at different training durations. As the obtained F-ratio for two days per week (6.054) and three days per week training (12.506) was more than the required F-ratio (2.83) to be significant at 0.05 level.

The findings of the time pressure transfer test suggest that two days per week and three days per week at different training durations has significant improvement in penalty flick performance of hockey players.

TABLE -2
SIGNIFICANCE OF DIFFERENCE BETWEEN ORDERED PAIRED MEANS OF TRAINING DURATIONS ON PENALTY FLICK PERFORMANCE WITH TIME PRESSURE CONDITION ON TWICE A WEEK PETTLEP IMAGERY TRAINING

Pre	6 Weeks	9 Weeks	12 Weeks	6 Weeks	C.I.
17.933	20.933	-	-	3.000	5.726
17.933	-	24	-	6.067*	5.726
17.933	-	-	29.6	11.670*	5.726
-	20.933	24	-	3.067	5.726
-	20.933	-	29.6	8.667*	5.726
-	-	24	29.6	5.600	5.726

* Significant at 0.05 level

It is evident from table-20 that there is no statistically significant difference between mean scores of pre-test and six weeks post-test (3); six weeks post-test and nine weeks post-test (3.067); nine weeks post-test and twelve weeks post-test (5.60) at 0.05 level. As the mean difference between these durations were less than the required f-ratio 5.726 to be significant at 0.05 level. The mean difference between pre-test and nine weeks post-test (6.067); pre-test and twelve weeks post-test (11.667); six weeks post-test and twelve weeks post-test (8.667) were significant at 0.05 level. As the mean difference between these durations were more than the required f-ratio 5.726 to be significant at 0.05 level.

The performance data on twice a week PETTTLEP imagery training suggest that PETTTLEP imagery training with time pressure condition given twice a week for twelve weeks is quite effective in improving Penalty flick hockey performance of a player.

TABLE – 3
SIGNIFICANCE OF DIFFERENCE BETWEEN ORDERED PAIRED MEANS OF TRAINING
DURATIONS ON PENALTY FLICK PERFORMANCE WITH TIME PRESSURE
CONDITION ON THREE TIMES PER WEEK PETTTLEP
IMAGERY TRAINING

Pre	6 Weeks	9 Weeks	12 Weeks	6 Weeks	C.I.
21.133	23.867	-	-	2.733	4.613
21.133	-	28.333	-	7.200*	4.613
21.133	-	-	34.333	13.200*	4.613
-	23.867	28.333	-	4.467	4.613
-	23.867	-	34.333	10.467*	4.613
-	-	28.333	34.333	6.000*	4.613

* Significant at 0.05 level

It is evident from table–21 that there is statistically insignificant difference between means of pre-test and six weeks post-test (2.733); six weeks post-test and nine weeks post-test (4.467). As the mean difference between these training durations were less than the confidence interval of 4.613 required to be significant at 0.05 level. The mean differences between pre-test and nine weeks post-test (7.2); pre-test and twelve weeks post-test (13.2); six weeks post-test and twelve weeks post-test (10.467); nine weeks post-test and twelve weeks post-test (6.000) were statistically significant at 0.05 level. As the mean difference between these durations were more than the confidence interval of 4.613 to be significant at 0.05 level.

It means that the Penalty flick hockey performance with time pressure condition increases with increased duration of training. Results indicates that PETTTLEP imagery training with time pressure condition given three times a week for nine weeks and twelve weeks increases the penalty flick performance of hockey player. PETTTLEP imagery training with time pressure condition training three days per week for twelve weeks give better results than training for nine weeks.

4. DISCUSSION

PETTTLEP imagery training for one day per week has no significant effect on hockey players performance. In twice a week PETTTLEP imagery training, PETTTLEP imagery training given twice a week for twelve weeks is quite effective in improving Penalty flick hockey performance of a player. PETTTLEP imagery training with time pressure condition training three days per week for twelve weeks give better results than training for nine weeks.

5. CONCLUSION

The result indicates that six weeks training program was not effective enough to produce desired results. Penalty flick performance after PETTTLEP imagery training of nine weeks duration indicated that a player must be trained for two and more than two days per week (2x/wk) to improve his penalty flick performance. After twelve weeks training for three days per week (3x/wk) showed much more improvement in their penalty flick hockey skill performance. One day per week (1x/wk) training has no significant effect on hockey players performance. In twice a week (2x/wk) PETTTLEP imagery training, PETTTLEP imagery training given twice a week (2x/wk) for twelve weeks is quite effective in improving Penalty flick hockey performance of a player. In three times per week (3x/wk) PETTTLEP imagery training, the Penalty flick hockey performance increases with increased duration of training. PETTTLEP imagery training with time

pressure condition training three days per week (3x/wk) for twelve weeks give better results than training for nine weeks.

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COMPARATIVE STUDY OF JOB SATISFACTION BETWEEN MALE AND FEMALE SPORT PHYSICAL EDUCATION TEACHERS OF UTTAR PRADESH

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ABSTRACT

The purpose of study was to assess and compare the job satisfaction between male and female physical education teachers of Uttar Pradesh. Sixty Five (Males= 42, Females=23) physical education teachers from colleges and universities located in urban region of Varanasi district . were selected as the sample for the study. The MSQ was used to measure job satisfaction. The instrument utilizes 20- dimensions Likert-type scale format and samples both intrinsic and extrinsic_reinforcement dimensions with a total of 100 items. To assess the job satisfaction between male and female physical education teachers, mean, standard deviation , percentage, rank order and t-ratio were computed for each dimension of MSQ. The results of study revealed that the majority of physical education teachers of both sex were from urban universities and colleges in between 36 years and 55 years of age and having doctorate degree with 7 to 10 years experience. They were more satisfied in . policies, compensation , and responsibility dimensions of job satisfaction. The significant differences were found between the male and female teachers on social service and supervision (HR) dimensions of job satisfaction

Keywords: Job Satisfaction, Males, Females, physical Education, Teacher,, MSQ

1. INTRODUCTION

Physical education is the education of man 'in' and 'by' means of physical activity. Physical education is that education which starts with physical development and advances towards perfect development of human being, the ultimate result being vigorous and strong body, acquisition of sound health, mental alertness, and social and emotional balance. Such an individual will be able to interpret new situations effectively, in more meaningful and purposeful manner and can be said to be a "Physically Educated Person".

Today, teaching in Physical Education has become a demanding profession which requires exceptional skills. Physical education teachers have to play a very vital role and their work involves a number of duties such as planning, teaching, evaluative, administrative and various unclassified ones. A physical education teacher requires a greater variety of talents than any other teaching area. His responsibilities are diverse and the society looks up to him as a leader who can create and maintain general fitness of the sedentary people on one hand and help produce sports persons at grass root level, on the other. As a result, physical education teachers working in schools feel their workload heavier, strenuous and difficult too. Some of them feel that in proportion to the expectations of the society they are not given due place, recognition, autonomy, pay, working conditions, opportunities for growth and advancement and so on. All this leads to job dissatisfaction or low job satisfaction among teachers in general and physical education teachers in particular in many developing countries around the world.

Comprehensive development of students and the job satisfaction of a physical education teacher have a crucial role for national development. The youths wishing to be physical education teachers can make a good career in this field, if they have interest, attitude, perception, study and vocational skill. According to Charlse Boosar, an ideal physical education teacher is supposed to have a chain of multiple social, spiritual, ethical and emotional values and qualities such as moral character, leadership, honesty, ingenuity, attractiveness, personality, absence of physical ugliness, best dynamic power, dynamic skill, high intelligence, erudition, best social rational competence, interest in learning, cooperative attitude, oral and written expression ability, co-ordination of activities etc. The physical education teacher having the above virtues should get job satisfaction.

Nowadays, there is, however, a general feeling that the teachers do not have satisfaction in their job. There seems to be growing discontentment towards their job as a result of which standard of education are falling. Teachers are dissatisfied in spite of different plans and programs, which have been implemented to improve their job. Job satisfaction consists of total body of feeling about the nature of job promotion, nature of supervision etc. that an individual has about his job. If the sum total of influence of these factors gives arises to feelings of satisfaction, the individual has job satisfaction. Under such circumstances it is essential that the proper understanding concerning satisfaction emanating from the job life be obtained.

Job Satisfaction can be an important indicator of how employees feel about their jobs and a predictor of work behaviours such as organizational citizenship (Organ & Ryan,1995),

absenteeism, (Wegge et. al., 2007). and turnover (Saari & Judge, 2004). Further, job satisfaction can partially mediate the relationship of personality variables and deviant work behaviors (Mount, Ilies, & Johnson, (2006). Aamodt, (2009) defines job satisfaction as the attitude an employee has toward his job Edwards, et al. (2008) refers to job satisfaction as an evaluative judgment about the degree of pleasure an employee derives from his or her job that consists of both the affective and cognitive components Job satisfaction is described as the feelings of employees resulting from the assessment of their job. It can be negative, positive, or moderate. (Moser and Galais (2007) highlighted that employee's ability and opportunities aid to improve their satisfaction of the job level.

Job satisfaction has always been a flash point of discussion among the researchers and scholars since long. Many investigations on job satisfaction in govt. and private school teachers of physical education were conducted by Indian reserchers. They concluded that government secondary school physical education teachers have significantly better satisfaction with their job than private secondary school physical education teachers (Singh, Sharma, and Kaur, 2006; Thakur, Chaurasia, Kumar & Thakur, 2012; Bhardwaj, 2012; Gupta and Gehlawat, 2013; Kumar, 2014; Mishra & Pandey, 2014; Malik, 2014; Sharma and Rana(2014).

The Job Satisfaction is an attitude which results from a balance and summation of many specific likes and dislikes experienced in connection with job. Katzell remarks that the term job satisfaction has been used in a variety of ways inter changeably with job morale, vocational satisfaction and job attitude by various authors.

The purpose of study was to assess and compare the job satisfaction between male and female physical education teachers of Uttar Pradesh.

2. METHODOLOGY

2.1 Selection of Subjects

Sixty Five (Males= 42, Females=23) physical education teachers from colleges and universities located in urban region of Varanasi district were selected as the sample for the study and all were also asked to participate in this study .

2.2 Description of Questionnaire

The MSQ was used to measure job satisfaction. It is a gender neutral instrument that can be administered to either groups or to individuals. The instrument utilizes 20- dimension Likert-type scale format and samples both intrinsic and extrinsic_reinforcement dimensions with a total of 100 items. Internal consistency reliability of the MSQ as estimated by the Hoyt's analysis-of-variance method show reliability coefficients for 83 percent of the groups at .80 or larger and only 2.5 percent lower than .70. The coefficient for each dimension ranged from .96 to .75. and a coefficient of .95 was obtained for the group on the MSQ.

2.3 Statistical Analysis

To assess the job satisfaction between male and female physical education teachers, the mean, standard deviation , percentage, rank order and t-ratio were computed for each dimension of MSQ. The significance level was set at .05 level.

3. RESULTS

To find out the significant differences between male and female physical education teachers, the mean, standard deviation, percentage, rank order and t-ratio were computed for each dimension of MSQ and data pertaining to this, has been presented in Table 1 to 3

TABLE 1
DEMOGRAPHIC CHARACTERISTICS OF TEACHERS (TOTAL N=65)

S.NO.	Variables	Items	N	Percent
1	Gender	Male	42	64.62
		Female	23	35.38
2	Age (Years)	Younger Than 35	02	3.08
		36 - 45	35	53.84
		46 - 55	17	26.15
		Older than 55	11	16.92
3	Degree Status	Master	03	04.62
		Doctorate	62	95.38
4	Year of Experience	1 - 6	01	01.55
		7 - 10	35	53.44
		11 - 15	18	27.69
		16 and above	11	16.92
5	Institution Location	Rural	00	00.00
		Urban	65	100.00
6	Institution Size	400 Student or Less	65	100.00
		401 - 800 Students	00	00.00
		More than 1000 Students	00	00.00

It is evident from Table 1 that in case of gender, there were more males than females, and for age, over 70 percent of the respondents were between 36 and 55 years. As far as education was concerned in the universities and the colleges, the majority of the respondents held a doctorate degree, and a little of them held the Master degree in the universities and colleges. The largest number of respondents had been a physical education teacher in universities and colleges for 7-10 years, and over 70 percent of physical education teachers had been in their jobs fifteen years or less. The table also shows that the hundred percent of physical education teacher were from urban universities and colleges. Finally, the all the institutions ranged in size from 400 students or less than 400.

TABLE 2
RANK ORDER OF COACHES OF DIFFERENT GAMES AND SPORTS ON MSQ
DIMENSIONS

Dimensions	N	Mean	Rank Order
Policies	65	3.38	3
Compensation	65	3.02	3
Responsibility	65	3.01	3
Coworker	65	2.95	2
Creativity	65	2.93	2
Advancement	65	2.92	2
Supervision (HR)*	65	2.86	2
Achievement	65	2.85	2
Supervision (Technical)	65	2.85	2
Recognition	65	2.84	2
Ability	65	2.83	2
Variety	65	2.80	2
Activity	65	2.79	2
Independence	65	2.75	2
Working Conditions	65	2.74	2
Status	65	2.73	2
Authority	65	2.68	2
Security	65	2.54	2
Moral Value	65	2.40	2
Social Service	65	2.37	2

From table 2, it is clearly evident that the three top ranking dimensions were policies, compensation, and responsibility. The physical education teachers were “Satisfied” (3.01-3.38) about rewarded to institution system, pay in contrast to the amount of work and freedom to implement one’s judgment on the job that did not go against their conscience. In the rest of the dimensions of job satisfaction, physical education teachers were “Slightly Satisfied” (2.37-2.95).

TABLE 3
SIGNIFICANCE OF DIFFERENCES BETWEEN MEAN SCORES OF MALE AND FEMALE TEACHERS ON TWENTY DIMENSIONS ON JOB SATISFACTION

Dimensions	Mean		MD	σ DM	t-ratio
	Male (N=42)	Female (N=23)			
Ability Utilization	13.07	14.09	1.02	0.66	1.55
Achievement	14.05	14.35	0.70	0.59	1.12
Activity	14.55	14.30	0.24	0.61	0.40
Advancement	13.81	14.17	0.36	0.66	0.56
Authority	14.29	14.35	0.06	0.58	0.11
Policies	14.31	14.78	0.47	0.64	0.73
Compensation	13.17	13.91	0.75	0.64	1.16
Coworker	13.69	14.17	0.48	0.72	0.68
Creativity	13.38	13.74	0.36	0.59	0.61
Independence	12.86	12.87	0.01	0.66	0.02
Moral Value	13.64	13.43	0.21	0.60	0.35
Recognition	14.45	13.39	1.02	0.63	1.68
Responsibility	13.69	13.96	0.27	0.57	0.47
Security	14.38	13.91	0.47	0.70	0.67
Social Service	12.69	14.04	0.35	0.60	2.24*
Social Status	13.24	13.74	0.50	0.60	0.84
Supervision (HR)*	13.83	15.48	1.65	0.65	2.54*
Supervision (Technical)	14.00	13.26	0.74	0.60	1.23
Variety	13.71	14.78	1.07	0.71	1.51
Working Conditions	13.83	12.78	1.05	0.55	1.90

*Significance at .05 level
 $t_{.05}(63) = 2.00$

It is evident from table 3, that the statistically significant differences were found between the male and female teachers on social service and supervision (HR) dimensions of job satisfaction, as the obtained t-values of 2.24 and 2.54 respectively were higher than the required t-value of $t_{.05}(63) = 2.00$. But, there were no statistically significant difference between the male and female teachers in rest of the seventeen dimensions of job satisfaction i.e. Ability utilization, Achievement, Activity, Advancement, Authority, Company Policies and practices, Compensation, Co-worker, Creativity, Independence, Moral Value, Recognition, Responsibility, Security, Social Status, Supervision (Technical), Variety, and Working Conditions, as the obtained t-values of 1.55, 1.12, 0.40, 0.56, 0.11, 0.73, 1.16, 0.68, 0.61, 0.02, 0.35, 1.68, 0.47, 0.67, 0.84, 1.23, 1.51, and 1.90 respectively were less than the required t-value to be significant.

4. DISCUSSION

Satisfaction is the most important perspective in life of an individual. If the person is satisfied with his/her work or profession he/she may be able to proceed smoothly with his teaching and as a result person can achieve greater heights in life. In the same way satisfaction is necessary in every profession. Whether, it is physical education or general education. But when we are dealing with these professions a bit certain differences arises. In some cases in spite of getting equal salary and having equal status, most of the teachers seems to be unsatisfied with their profession. There could be various reasons for their un-satisfaction towards their job. In case of physical education teacher in spite of having good. Knowledge or command over the subject. He/she cannot feel comfortable, the most important reason seems to be the lack of facilities such as in some college students wants to play but they do not have grounds to play, do not have sufficient equipment.

5. CONCLUSIONS

The results of study revealed that

1. Majority of physical education teacher were from urban universities and colleges..
2. Majority of Males than females physical education teachers , respondents were between 36 years and 55 years of age.
3. Majority of Males than females physical education teachers held a doctorate degree with 7 to 10 years experience.
4. The physical education teachers were “Satisfied” (3.01-3.38) in top ranking dimension i.e. policies, compensation , and responsibility
5. The Physical education teachers were “Slightly Satisfied” (2.37-2.95). in the rest of the dimensions of job satisfaction
6. Statistically significant differences were found between the male and female teachers on social service and supervision (HR) dimensions of job satisfaction
7. Male and female physical education teachers did not differ significantly in rest of the seventeen dimensions of job satisfaction

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PERSONALITY PROFILE OF SPORTS JOURNALISTS BASED ON PREVIOUS INVOLVEMENT IN COMPETITIVE SPORTS

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ABSTRACT

The present study assessed the personality profile of sports journalists based on their previous involvement in competitive sports. To conduct the study 50 former players cum sports journalists (Average age 42.11 years) and 50 sports journalist (Average age 39.17 years) with no previous involvement in competitive sports were selected as sample. The former players cum sports journalists have the credentials of participation in the national level tournament. To assess the personality profile of selected sports journalists, the Hindi PEN inventory prepared by Menon (1978) was used. Results revealed that ex-players cum sports journalists were low neurotic and extraverted as compared to sports journalist with a non-sporting background. No significant difference was observed in the psychoticism dimension of personality between the two groups. It was concluded that the advantage of previous involvement in competitive sports in terms of superior emotional stability and extraverted characteristics was seen in ex-players cum sports journalist as compared to sports journalists from the non-sporting background.

Keywords: Personality, Sports Journalist, Ex-players, Profile, Competitive

1. INTRODUCTION

Sports journalism is also a form of writing which covers sporting events and competitions. It started in the early 1800 with sports news in print media. In India, sports journalism was not considered serious journalism until the advent of the corporate sector. It was believed that sports journalists do not require a special skill set and intelligence. The history of sports journalism is not too old and it was started in 1930 in the form of sports news in free press journal. Sports journalism in modern times in India is very competitive and a lot of ex-players are part of it. Some of the sports journalists also come from the non-sporting background. Many ex-players are taking sports journalism as a career after retirement. This creates challenges for sports journalists from the non-sporting background. The popularity of former players is immense and people love to read their articles. Whether personality plays a part in framing a good sports columns of ex-players than the sports journalists from the non-sporting background is an issue unexplored. Sports reporting may also be influenced by personality just like reporting in other allied areas. In a study by Khan (2005) it was found that personality is linked to the performance of journalist. It was found that neuroticism significantly affects journalists adaptability in a noisy atmosphere. It was also observed that neuroticism was also linked to worry about the deadline to present the article. Extraversion was strongly correlated with news source in this study. It is indeed natural for an introvert to feel some discomfort to approach someone to get information about a new story. In this sense, an introverted sports journalists may not get the inside story while his/her counterpart with an extraverted personality may lay hand to that information. According to Nuraeni et al. (2018) the job performance of journalists is dependent on certain psychological factors such as motivation, extraversion etc. These psychological factors are thought to be important for journalists to survive the tough competition. Several personality theories have been propounded under psychology and Eysencks Personality theory is one of them. Eysenck, a German-born British psychologist, went a step further in the adopting factor analysis technique by extracting second-order factors and grouping traits into definite personality types. The three dimensions of Eysenck's personality is psychoticism, extraversion-introversion and neuroticism (PEN). Psychoticism is the first dimension propounded by Eysenck. The high score on this dimension denotes lack of concentration, insensitive and impulsive behaviour and egocentric characteristics in an individual. Characteristics such as outgoing, sociable, optimistic denote an extroverted person while characteristics such as reserved, reflective and introspective are associated with introversion personality. The neuroticism dimension refers to emotional stability/instability. The low neurotic people are stable, calm, even-tempered and reliable while the high neurotics are anxious, moody, toughness and restless. Eysenck's work has verified that human behaviour and personality can be organised into a hierarchy with explicit responses at the bottom and the definite personality type at the top. The PEN model propounded by Eysenck has two main categories i.e. descriptive and causal. The descriptive aspect of the model is a hierarchical taxonomy based on factor analysis.

Studies have shown that personality is linked to job stress, work behaviour and other communication problems so it would be interesting to compare the personality profile of ex-player cum sports journalist with sports journalists from the non-sporting background. The research work about sports journalist is not exhaustive but few studies namely by Kennard et al. (2018), Lee et al. (2016), Hussain (2014), Kian and Clavio (2011), Hardin et al. (2008), Hagerty (2005) have taken various issues related to it. In limited research work personality of sports-journalist have not been assessed in the light of their previous involvement in competitive sports, hence the present study was planned.

1.1 Objectives

The objective of the present study was to compare the personality of sports journalists with and without previous involvement in competitive sports

1.2 Hypothesis

It was hypothesized that the former national players cum sports journalist will be low psychotic, extrovert and less neurotic as compared to sports journalists with no previous involvement in competitive sports.

2. METHODOLOGY

2.1 Sample

To conduct the study 50 former players cum sports journalists (Average age 42.11 years) and 50 sports journalist (Average age 39.17 years) with no previous involvement in competitive sports were selected as sample. The former players cum sports journalists have the credentials of participation in the national level tournament. The selection of sports journalists was done from various daily newspapers circulated in India. Purposive sampling was used in this study.

2.2 Instrument

Eysenck's Psychoticism, Extraversion and Neuroticism (PEN) Inventory: The extraversion, neuroticism and psychoticism dimensions of personality among sports journalist were assessed by the Hindi version of Eysenck's PEN inventory prepared by Menon et al (1978). It consists of 78 items. The test-retest reliability coefficients have been found as 0.630, 0.888, 0.687 and 0.337 for P, E, N and L scales respectively. The authors of this Hindi PEN also attempted to estimate its correlation with the English PEN and found the resulted coefficients fairly high.

2.3 Procedure

100 sports journalists were selected purposively from various daily newspapers circulated in India. The Eysenck PEN Inventory was communicated on an online platform as google forms. The subjects were asked to give their response on each statement and submit the google form.

3. RESULTS

The obtained responses were tabulated and an Independent sample 't' test was used and the results are shown in Tables 1.

TABLE 1
COMPARISON OF PSYCOTOCISM DIMENSION OF PERSONALITY AMONG
SPORTS JOURNALISTS ON THE BASIS OF THEIR PREVIOUS
INVOLVEMENT IN SPORTS

Sports Journalists	N	Mean	SD	MD	DM	t-ratio
With Previous Involvement in Competitive Sports	50	5.58	3.72	0.38	0.95	0.40
Without Previous Involvement in Competitive Sports	50	5.90	4.10			

*Significant at .05 Level

t.05 (98) = 1.98

A perusal of statistical entries reported in table 1 revealed that there was no significant difference in psychoticism dimension of personality between two study groups namely former players cum sports journalists (M=5.58) and sports journalists with no previous involvement in

competitive sports (M=5.90). The calculated $t=0.40$ also justifies this finding because it did not meet the statistical criteria of significance.

TABLE 2
COMPARISON OF EXTRAVERSION DIMENSION OF PERSONALITY AMONG
SPORTS JOURNALISTS ON THE BASIS OF THEIR PREVIOUS
INVOLVEMENT IN SPORTS

Group of Sports Journalists	N	Mean	SD	MD	DM	t-ratio
With Previous Involvement in Competitive Sports	50	13.02	2.46	0.98	0.49	1.99*
Without Previous Involvement in Competitive Sports	50	12.04	2.44			

*Significant at .05 Level

$t_{.05(98)} = 1.98$

Table 2 gives statistical figures regarding the extraversion dimension of personality in two study groups. It was found that the former players cum sports journalists were extrovert (M=13.02) as compared to sports journalists without any prior involvement in competitive sports (M=12.04) at .05 level of statistical significance.

TABLE 3
COMPARISON OF NEUROTICISM DIMENSION OF PERSONALITY AMONG
SPORTS JOURNALISTS ON THE BASIS OF THEIR PREVIOUS
INVOLVEMENT IN SPORTS

Sports Journalists	N	Mean	SD	MD	DM	t-ratio
With Previous Involvement in Competitive Sports	50	5.72	2.77	1.62	0.62	2.63*
Without Previous Involvement in Competitive Sports	50	7.34	3.34			

*Significant at .05 Level

$t_{.05(98)} = 1.98$

In Table 3, when the neuroticism dimension of personality was compared between two study groups it was found that the former players cum sports journalists were low neurotic (M=5.72) as compared to sports journalists without any prior involvement in competitive sports (M=7.34) at .01 level of statistical significance.

4. DISCUSSION

Findings reveal that the personality of sports journalists differs based on their previous involvement in competitive sports. It shows that former players cum sports journalists were low neurotic and extrovert as compared to sports journalists with no previous involvement in competitive sports. Studies in the past have also shown the benefits of participation in sports on psycho-social development (Sidhu et al. 2013, Singh et al. 2013, Mittal, 2014; Chowdhary and Shrivastava, 2017). These studies have documented that participation in sports develop characteristics such as self-confidence, optimism, extrovert behaviour, emotional stability, cognition and superior mental skills. While participating in sports we learn to accept defeat and learn from our mistakes to bounce back. It also enables better coping ability during frustrating situations. Hence there is no surprise that former players cum sports journalist show better

personality characteristics such as emotional stability and extraversion as compared to sports journalist with no previous involvement in sports.

5. CONCLUSION

Based on results, it can be concluded that former players cum sports journalists were extrovert and low neurotic as compared to sports journalists without any previous involvement in sports.

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COMPARISON OF SPORTS EMOTIONAL INTELLIGENCE BETWEEN FEMALE PLAYERS OF COMBATIVE AND NON-COMBATIVE GAMES

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ABSTRACT

Emotional intelligence is one's unitary ability to understand, feel and choose emotions in cooperation with a person's thinking method for behaving in a very correct means, with the final word realization of happiness in himself. The purpose of the study was to compare the sports emotional intelligence of female players of combative and non-combative games. A sample consisted of Sixty one female players of combative (N=27) and non-combative (N=34) games. The age ranged of the participant was 18 to 28 years. . To test the Emotional Intelligence the questionnaire of Dr. C. D. Agashe and Dr. R. D. Helode was used. The emotional intelligence its sub scales on female players of combative and non-combative games were subjected to descriptive analysis (Mean and Standard Deviation), and t-test were used. The results of study revealed that the female players of combative and non-combative games had significant differences in their self-regulation, motivation, empathy and social skill domain of sports emotional intelligence. But Total sports emotional intelligence of female players in both category of games as a whole was also found significant. Female players of non-combative games were found to have more sports emotional intelligence than their counter parts.

Key Words: Female, Combative, Non-combative, game, Players, Emotional intelligence

1. INTRODUCTION

The field of sports psychology has evolved throughout the last thirty years to what we all know it to be nowadays, a relentless source of argument has been the efficaciousness of mental apply. A The skilled in sports psychology and applied sports psychology teach their students several range of psychological skills to boost the emotional aspects of performance.

In the field of sports psychology, several scientist like Singer murphy, and Tennant (1993), Singer, Hausenblas & Janelle, (2001) and Rushall & Lippmann, (1998) alternative sports psychologists in India and abroad had work laborious an excessive amount of. Sports psychology ar properly involved with the cognitive process, whether or not they ar operating in analysis or application settings. Sports psychology normally would take pleasure in determinant what sorts of mental apply ar applicable for specific functions and activities. Specification of however every model is employed would permit even more gain. applicable distinctions would permit guideline to be developed that might profit analysis and minimize inappropriate use in applied settings. (Rushall & Lippmann, 1998).

Researchers have known several dimensions that underlie most emotions. each sportsperson, across cultures, expertise completely different emotions so emotions ar innate. The four emotions types are: positive functionally optimum emotions (p+), negative and functionally optimum emotions (N+), positive and dysfunctional emotions (P-), negative and dysfunctional emotions (N-). These four world result classes generate individual feeling descriptors associated with every player's subjective experiences. The intensity levels for every of those emotions ar established employing a separate scale: the changed Borg's category quantitative relation scale CR-10 (Borg, 1992, 1998); that permits to check the quantitative relation comparisons of powers (Hanin, 2000) and deterioration of intensity levels directly. The intensity scale, expresses the practical impact a specific feeling had throughout a game. it's a quantitative characteristic of the result. Intensity dimension in IZOF identification is an index of the perceived effort of an contestant to execute a task. it's so a score of subjective experiences; of individual athlete; assessed by self report.

The emotions accommodates three main components (Deci, 1980; Young, 1973) specifically physiological changes, action tendencies and subjective experiences. The individual zone of optimum functioning (IZOF) model makes an attempt, to spot the emotions content relevant to performance, from an athlete's perspective (Fehr and Russell, 1984; cantor, Mischel and Schwarts, 1982). Research findings of end contestant report that changed cr -10 scales is beneficial in quantifying feeling intensities in performance connected emotions (Tummavuori and Hanin, 2002).

The measures might facilitate during this direction attempt to assist you. facilitate yourself and also the children in developing the power to properly understand feeling each in oneself and alternative. quit the misgivings and misperception of the sensation in alternative. It results in a hostile attribution bias. keep in mind that love invariably begets love, whereas suspicion, heatedness and aggressions square measure rewarded likewise. The word 'emotion' has been derived from the Latin word 'Emovere' which implies 'to excite', or 'shudder.

Emotional intelligence denotes for the power that however a personal will understand, management and appraise his emotions. Some researchers recommend that emotional intelligence may be learned and reinforced whereas alternative claim it's an inborn characteristic. it's outlined because the ability to watch one's own and other's feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and actions.

The emotional intelligence is made up of a set of skills and these skills can be improved through education. Schools serve as the prime location for the promotion of emotional intelligence (Tiwari and and Srivastava 2004). Goleman (1998) considered school as one place which can turn to compensate children's deficiencies in emotional and social competence.

Emotional intelligence (EI) has emerged as a key conception among researchers and practitioners alike, and is subject to growing interest in sport scientific discipline. Emotional intelligence is also outlined because the capability to reason with feeling in four areas; to understand, to integrate it in through, to grasp it and to manage it.

Although the term emotional intelligence has been outlined in several best sellers together with Dr. Daniel Goleman's 1995 book "emotional intelligence" in a very variety of the way comprising several temperament traits like empty, motivation, persistence, warmth and social skills nevertheless the foremost accepted scientific of the term emotional intelligence is also found within the following definition given by Johan D. Mayer and Peter Salovey in their 1997 book "emotional Development and also the Emotional intelligence

Emotional Intelligence is a lot of from time to time than Intelligence Quiescent. Intelligence Quiescent contributed solely regarding 200th to success in life, the opposite forces contribute the remainder.. Unlike I.Q. Emotional Intelligence could also be the simplest predictor of success in everything they undertake in their lives. not like what's claimed regarding I.Q., we are able to teach and improve in youngsters and individual some crucial emotional competencies paving the means for increasing their Emotional Intelligence and so creating their lives healthier, additional gratifying and winning in coming days.

The concept of sports emotional intelligence has been operationally defined as "the capacity of the sports persons and sports personnel for making pertinent use of self-awareness, self-regulation, motivation, empathy and social skills to manage their own feelings and emotions and those of others to ensure success through maximum best possible performance and behavior in the world of sports and games.



Dimensions of Emotional Intelligence

The read purpose of this outlined will be analysed as; an individual are going to be termed showing emotion intelligence proportion to his ability to spot and understand the varied kinds of emotions in others to .Emotional intelligence has not been studied in Bilaspur district therefore I actually have selected this area for my analysis work.

So the purpose of the study was to compare the sports emotional intelligence of female players of combative and non-combative games. It was also hypothesized that: female players of combative and non-combative games may differ in their five dimension of emotional intelligence.

2. METHODOLOGY

2.1 Sample

A sample consisted of Sixty one female players of combative (N=27) and non-combative (N=34) games. The age ranged of the participant was 18 to 28 years. Participants were selected randomly amongst national and inter- university level players.

2.2 Tool Used

To test the Emotional Intelligence the questionnaire of Dr. C. D. Agashe and Dr. R. D. Helode was used. This questionnaire is comprised of 15 questions of five domain of emotional intelligence i.e Self Awareness, Self regulation, motivation, empathy and social Skill.. There were 3 questions from each domain but not in sequence.

2.3 Statistical Analysis

Data on emotional intelligence its sub scales on female players of combative and non-combative games were subjected to descriptive analysis (Mean and Standard Deviation), and t-test were used.

3. RESULTS AND DISCUSSION

To find out the significance of differences between means of various dimensions of Emotional intelligence among female players of combative and non-combative games of Chhattisgarh, mean, SD, t-ratio were computed. Data pertaining to these analyses have been presented in table 1 to 5..

TABLE 1
COMPARISON OF SELF -AWARWNESS DIMENSION OF SPORTS EMOTIONAL INTELLIGENCE OF FEMALE PLAYERS OF COMBATIVE AND NON-COMBATIVE GAMES

S.NO	Type of Games	N	Mean	MD	σ_D	t-ratio
1	Combative	27	38.15	6.85	4.25	1.61
2	Non-combative	34	45.00			

Significant at .05 Level

t.05 (59)=2.00

Table 1 reveals that significant difference was not found between combative and non-combative female players in their self-awareness dimension of sports emotional intelligence, as the obtained t-ratio of 1.61 was less than the required t.05(59)=2.00

TABLE 2
COMPARISON OF SELF REGULATION DIMENSION OF SPORTS EMOTIONAL INTELLIGENCE OF FEMALE PLAYERS OF COMBATIVE AND NON-COMBATIVE GAMES

S.NO	Type of Games	N	Mean	MD	σ_D	t-ratio
1	Combative	27	28.89	9.64	3.59	2.69*
2	Non-combative	34	38.53			

Significant at .05 Level

t.05 (59)=2.00

Table 2 reveals that significant difference was found between combative and non-combative female players in their self-regulation dimension of sports emotional intelligence, as the obtained t-ratio of 2.69 was high than the required t.05(59)=2.00

TABLE 3
COMPARISON OF MOTIVATION DIMENSION OF SPORTS EMOTIONAL INTELLIGENCE OF FEMALE PLAYERS OF COMBATIVE AND NON-COMBATIVE GAMES

S.NO	Type of Games	N	Mean	MD	σ_D	t-ratio
1	Combative	27	35.74	10.29	3.66	2.81*
2	Non-combative	34	46.03			

Significant at .05 Level
 t.05 (59)=2.00

Table 3 reveals that significant difference was found between combative and non-combative female players in their motivation dimension of sports emotional intelligence, as the obtained t-ratio of 2.81 was high than the required t.05(59)=2.00

TABLE 4
COMPARISON OF EMPATHY DIMENSION OF SPORTS EMOTIONAL INTELLIGENCE OF FEMALE PLAYERS OF COMBATIVE AND NON-COMBATIVE GAMES

S.NO	Type of Games	N	Mean	MD	σ_D	t-ratio
1	Combative	27	26.30	10.32	3.72	2.77
2	Non-combative	34	36.62			

Significant at .05 Level
 t.05 (59)=2.00

Table 4 reveals that significant difference was found between combative and non-combative female players in their empathy dimension of sports emotional intelligence, as the obtained t-ratio of 2.77 was high than the required t.05(59)=2.00

TABLE 5
COMPARISON OF SOCIAL SKILL DIMENSION OF SPORTS EMOTIONAL INTELLIGENCE OF FEMALE PLAYERS OF COMBATIVE AND NON-COMBATIVE GAMES

S.NO	Type of Games	N	Mean	MD	σ_D	t-ratio
1	Combative	27	37.41	0.09	3.83	0.024
2	Non-combative	34	37.50			

Significant at .05 Level
 t.05 (59)=2.00

Table 5 reveals that significant difference was not found between combative and non-combative female players in their social skill dimension of sports emotional intelligence, as the obtained t-ratio of 0.024 was less than the required t.05(59)=2.00

TABLE 6
COMPARISON OF SUM OF SPORTS EMOTIONAL INTELLIGENCE OF FEMALE PLAYERS OF COMBATIVE AND NON-COMBATIVE GAMES

S.NO	Type of Games	N	Mean	MD	σ_D	t-ratio
1	Combative	27	166.48	37.20	11..31	3.29
2	Non-combative	34	203.68			

Significant at .05 Level, t.05 (59)=2.00

Table 6 reveals that significant difference was found between combative and non-combative female players as a whole in their sports emotional intelligence, as the obtained t-ratio of 3.29 was high than the required $t_{.05(59)}=2.00$

4. DISCUSSION

To improve one's emotional intelligence—and one's decision-making abilities—we need to understand and manage our emotions. This is accomplished by developing key skills for controlling and managing overwhelming stress and becoming an effective communicator. In conclusion, the present study has extended the investigation of emotional intelligence by examining its relationship with emotional states associated with five domain of Emotional Intelligence.

When the female players of combative and non-combative were compared of various domain of sports emotional intelligence, t-ratio resulted significant differences in self-regulation, motivation, empathy and social skill domain of sports emotional intelligence. In case of self-awareness domain of emotional intelligence, similarity was observed among female players of both category of games. When the female players of non-combative games as a whole were compared together on emotional intelligence, t-ratio also resulted significant differences among female players of both categories of game. Female players of non-combative games were found to have more sports emotional intelligence than their counter parts.

5. CONCLUSION

The female players of combative and non-combative games had significant differences in their self-regulation, motivation, empathy and social skill domain of sports emotional intelligence. But they did not differ in self-awareness domain of sports emotional intelligence. Total sports emotional intelligence of female players in both category of games as a whole was also found significant. Female players of non-combative games were found to have more sports emotional intelligence than their counter parts.

6. LIMITATION

This study had some limitations, sample inadequacy; and the study is only narrowed to some individual and group sports and it specifies only to university and some national level player that makes popularization of findings difficult. Limited age range, inclusion of both male and female sports persons in this study can also be difficult to generalize the results.

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PREVALENCE OF GROIN PAIN ON THE BASIS OF THEIR PLAYING POSITIONS IN DISTRICT LEVEL BASKETBALL PLAYERS

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ABSTRACT

Groin pain in competitive sports is a frequent and complex ailment accounting for 2–5% of all sports-related pain development. This pain may be unilateral or bilateral, may involve one or more sites from time to time, and may present acutely, sub acutely or by gradual onset. It typically presents during or after sudden change of direction running where limitation of rotation of the hip is thought to be a contributing factor. The aim of this study is to check the prevalence of Groin Pain on the basis of their Playing Position in basketball players, to estimate the percentage of Basketball Players having Groin Pain and to detect the risk of chronic or longstanding Groin Pain. Based on Inclusion and Exclusion criteria 100 subjects were selected by purposive sampling with 20 players of all positions each. The HAGOS scale was filled by subjects which is a patient-reported outcome measure employing five-item Likert scales. Data was collected according to the scale. The results of the study show that maximum pain prevalence represented by lower HAGOS scores are seen in players who play at Center, Shooting Guard and Power Forward Positions compared with those who play at Point Guard and Small Forward Positions.

Key Words: Groin Pain; Basketball Players; Playing Positions

1. INTRODUCTION

Groin pain may originate from muscles, tendons, bones, bursae, fascial structures, nerves, and joints. With respect to causes of downtime, inguinal pain is in third place, behind fractures and injuries to the anterior and posterior cruciate ligament. It may present acutely or otherwise, and may arise from more than one source (**Lovell, 1995**).

Groin pain is a frequent and complex ailment in competitive sports accounting for 2–5% of all sports-related pain development, with an incidence of 5–18% among professional soccer and tennis players. In sports, chronic groin pain frequently leads to extended time lost due to injuries despite all therapies (**Striegel, Best and Nieb, 2010**).

Groin pain typically presents during or after kicking and running, and is seen most often in footballers (soccer and Australian football players) where limitation of rotation of the hip is thought to be a contributing factor. This limitation is believed to transfer stress (either by shearing or distraction) across the symphysis and thus contributes to disruption of this fibro cartilaginous joint (**Williams, 1978**).

Younger athletes participating in high impact sports have an increased risk of developing cam-type deformities and eventual osteoarthritis (**Agricola et al. 2014**). Historically, many hip injuries in athletes have been neglected because of a lack of specific diagnostic criteria and undefined treatment modalities. However, recent developments in magnetic resonance arthrography, hip arthroscopic surgery, and biomechanics have led to advances in the diagnosis and treatment of nonarthritic hip and groin conditions. Main cause of groin pain is mainly hip disorders, and it can be diagnosed correctly via both clinical symptoms and imaging examinations such as plain radiographs or magnetic resonance imaging (MRI). However, there are patients with groin pain with no specific image findings around the hip joint (**Kurosawaa, 2017**).

Athletic Groin Pain (AGP) is a common chronic presentation in professional and amateur sport. A recent systematic review in football reported an incidence of AGP between 0.2 and 2.1/1000 hour in men; hip/groin injuries were the third most common injuries (14%) (**Werner et al. 2009**).

The rate of incidences are similar in field sports such as Rugby Union, Australian Rules Football and Gaelic football which share the common requirement of acceleration, deceleration, kicking and ‘cutting’ (**Wilson et al. 2007**). In sports for the evaluation of groin pain, biomechanical segmental coordination (i.e. relationships between segments articulating at the hip, knee and ankle joints) during movements has never been considered whereas segmental coordination is intrinsic to an athlete’s ability to control change of direction and produce power to execute movement (**Thorborg et al. 2010**).

In athletes loss of segmental coordination may lead to tissue injury, if the magnitude, rate and direction of the loading of muscles around a joint or joints exceeds that of tissue tolerance. This coordination can be examined using a three-dimensional motion analysis system. Three-dimensional motion analysis systems have successfully identified pathomechanics of anterior cruciate ligament injuries and might also help explain causes of painful structures encountered in AGP. Therefore, studying the movement strategies during a multidirectional movement task might reveal potential injury mechanisms (**Havens and Susan, 2015**). Chronic inguinal pain is another term accounting for the groin injuries in sports. It is defined as the presence of pain in the groin region for more than 6 months. The causes of groin or pelvic pain in females include disorders of musculoskeletal, gynecologic, urologic, or gastroenterological organs (**Apte et al. 2011**).

Basketball is an aerobic-based anaerobic sport which requires high intensity activities such as jumping (for rebounds, blocks and shots), turns, dribbles, sprints, screens and low intensity activities such as walking, stopping and jogging. These activities are reported to be the cause of injuries (Ayegbusi et al. 2017). From aggressive, low post play to high-flying dunks, the physical nature of the game has become extremely aggressive. Sports injuries can be expected to result with the type of sport it has become and the grueling length of each season (Anderson, 2001).

The game of basketball carries a higher risk of injury than most other sports, and some have demonstrated that female basketball players are more prone to injury than their male counterparts (Chandy and Grana, 1985). Women's injury frequency is 1.6 times that of men. Women sustained significantly more knee and thigh injuries as well as sprains, strains, and contusions. Men had significantly more muscle spasms. Other injuries occurred in similar patterns in both sexes. Alterations in training programs are suggested with emphasis on women's strengthening and men's flexibility. Although there is a heightened understanding of intraarticular hip pathology, most athletic-related injuries to the hip are extra-articular (Zelisko, Bates and Marriane, 1982). 11.5% of all injuries in professional basketball players were related to the hip, with the majority of these being muscle strains and contusions (Drakos et al. 2010).

The most commonly injured body area, accounting for more than half of all orthopaedic injuries in basketball is lower extremity. . The scope of conditions that NBA athletic trainers and team physicians must be familiar with is much broader. The causes leading to injuries in basketball involve abruptly flexing and rotational movements in the hip joint and groin with rapid changes of direction and high torqueing. Position of the player in the court accounts for the metabolic load experienced during a game as it varies according to playing position (Chad, 2000).

Player's physiological characteristics differ according to their position and role on the court. The straining of fascias as well as musculoskeletal structures of the thigh and caudal abdominal musculature during game leads to pain (Omar, Zoga and Kavanag, 2008).

A validated Patient Reported Outcome (PRO) questionnaire was developed in accordance with the consensus-based standards due to the emphasis on valid and reliable evaluation of hip and groin pain. The Copenhagen Hip and Groin Outcome Score (HAGOS) consists of six separate subscales assessing pain, symptoms, physical function in daily living, physical function in sport and recreation, participation in physical activities and hip and/or groin-related quality of life and is recommended for use in interventions where the patient's perspective and health-related quality of life are of primary interest (Thorborg et al. 2014).

1.1 Theoretical Framework

As we try to understand this study, we have listed a few researches that might help explain the science behind the drive to conduct a study on groin injuries in athletes and how it is related to playing position of the player. Igor Tak et al. (2017) conducted a systematic review on role of lower hip range of motion as a risk factor for groin pain in athletes and found that total hip ROM is the factor most consistently related to groin pain in athletes. Screening for hip ROM is unlikely to correctly identify an athlete at risk of developing groin pain because of the Small ROM differences found and poor ROM measurement properties. (Kerbel, Christopher, John and Marry, 2018) studied epidemiology of hip and groin injuries in collegiate athletes in the United States and found that hip/groin injuries are most common in sports that involve kicking or skating and sudden changes in direction and speed. Most hip/groin injuries in collegiate athletes

are noncontact and do not result in time lost from competition, and few require surgery. This information can help guide treatment and prevention measures to limit such injuries in male and female collegiate athletes. **Henry et al. (1982)** conducted a study on the injury rate in professional basketball and described that Foot, ankle, knee, back, and hand injuries were found to occur most often. The most common as well as the most severe injuries were those of the ankle and knee. The average time loss from play due to injury was amazingly consistent for each specific injury. Rehabilitation of injuries varied from no playing time loss to two years. Even though knee injuries carry a poor prognosis, the authors conclude that the incidence of severe injury in professional basketball is low.

A study on hip and groin pain in sub-elite south African footballers and stated that the prevalence of groin injuries in this population is relatively high (57%) and requires lengthy rehabilitation time. The HAGOS is a suitable tool to identify groin pain in this population within the sports and recreation and quality of life subscales. Isokinetic hip strength and range of motion testing lacked sensitivity in detecting deficits in players with a previous groin injury. Only two-thirds of injured players consulted a medical practitioner, increasing the likelihood that rehabilitation was inadequate. It is therefore recommended that player/coach education regarding injury (**Dowson et al. 2015**).

1.2 Aim

The aim of study was to check the prevalence of groin pain on the basis of their playing positions in district level basketball players by using HAGOS scale as a diagnostic tool.

1.3 Objectives

1. To estimate the percentage of Basketball Players having Groin Pain.
2. To estimate the percentage of Basketball Players having Groin Pain referring to specific Playing Position in the court.

1.3 Hypotheses

- H:1. The score outcome of HAGOS will be different for each playing position.
H:2. There will be a positive correlation between the two variables.

1.4 Research Questions

1. Is there a relationship between Groin Pain and Playing Position?
2. Which Position accounts for maximum cases of Groin Pain?

1.5 Operational Definition

For a better understanding of the variables in the study, an operational definition is given. The variables are Groin Pain and Basketball.

1.5.1 Basketball

Basketball is defined as a game played between two teams of five players in which goals are scored by throwing a ball through a netted hoop fixed at each end of the court as stated by (Clarendon,1991).

1.5.2 Groin Pain

It is defined as tendon enthesitis of adductor longus muscle and abdominal muscles that may lead to degenerative arthropathy of pubic symphysis in an advanced stage as mentioned by (Jankovic et al. 2001).

2 METHODOLOGY

2.1 Sample

The sample comprises of 100 sports players from various Academies and Stadiums of Punjab. The subjects were selected by Purposive Sampling technique. The age group of the subjects taken for study was from 19 to 29 years.

2.2 Inclusion criteria and Exclusion criteria

Inclusion criteria- Comprise of basketball players from various academies and stadiums of Punjab state. The age group of the subjects taken for study was from 19 to 29 years. Those Subjects were taken who regularly played basketball at least an hour a day, three or more days per week for at least a year.

Exclusion criteria- Sport players who were having history of recent surgery, recent fracture, musculo-tendinous injury in the 12 weeks before the study as reported by the subject. Basketball players with neurological deficit or spinal pathology were also excluded.

2.3 Research Design

This study used the descriptive epidemiology design.

2.4 Description of Tools U

Copenhagen Hip and Groin Outcome Score (HAGOS) was created by Thorborg, Branci, Stensbirk, Jensen and Holmich in 2011. It consists of six separate subscales assessing Pain, Symptoms, Physical function in daily living, Physical function in Sport and Recreation, Participation in Physical Activities and hip and/or groin-related Quality of Life. Test-retest reliability was substantial, with Intraclass Correlation Coefficients (ICC) ranging from 0.82-0.91 for the six subscales. Construct validity and responsiveness were confirmed with statistically significant correlation coefficients (0.37-0.73, $p < .01$) for convergent construct validity, and for responsiveness from 0.56-0.69, $p < .01$ as mentioned by (Thorborg et al.2010).

2.5 Procedure

Based on the Inclusion and Exclusion criteria 100 subjects were selected by purposive sampling. Subjects were the district level Basketball players and divided according to their playing positions as 20 players of each position which includes center, Power Forward, Small Forward, Shooting Guard and Point Guard. Informed consents were taken from all the subjects. The subjects were assessed through general assessment forms. The players were interviewed and questioned regarding injuries sustained in previous years. Purpose of the study that was, to check the prevalence of Groin Pain in the basketball players and to check the player playing at which playing position is more susceptible to groin injuries was explained to the subjects. They were assessed using HAGOS questionnaire, which covered six dimensions including Symptoms, Pain, Function in daily living (ADL), Function in sport and recreation (Sports/Rec), participation in physical activities (PA) and hip and/or groin-related quality of life (QOL). The subscale Symptoms included questions regarding discomfort in hip or groin, presence of clicking sound, difficulty in stretching legs far out to the side, difficulty in full stride, presence of sudden twinging or stabbing sensation in hip or groin and stiffness after first awakening in the morning or lying, sitting and resting.

The subscale Pain included questions regarding pain in the areas other than hip and groin which according to subject can be related to hip or groin pain and presence of pain while movements like straightening of hip, bending, stair climbing sitting or lying. The subscale of ADL included the questions concerned with physical function in which the player had to indicate the degree of difficulty, due to hip and groin pain, experienced by him in activities like walking up stairs, bending down, getting in or out of car, lying in bed and heavy domestic duties. The subscale of Sports/Recreation included questions concerning physical functions when participating in higher-level activities such as squatting, running, twisting or pivoting on a weight bearing leg, walking on an uneven surface and sudden explosive movement that involve quick footwork, such as accelerations decelerations and change of direction. The subscale of PA

included the questions which were about the ability of the player to participate in his/her preferred physical activities at their normal performance level.

The subscale of QOL included the questions regarding modifications made by the subject in the life style to avoid activities potentially damaging hip or groin and restrictions due to hip or groin problem. Verbal introduction of the questionnaire was given to subjects. The 6 HAGOS subscales are scored separately: Symptoms (7 items); Pain (10 items); ADL (5 items); Sport/Rec (8 items); PA (2 items) and QOL (5 items). The past week was taken into consideration when answering the questions. Standardized answer options were given (5 Likert boxes) and each question gets a score from 0 to 4, where 0 indicates no problem. The six scores are calculated as the sum of the items included, in accordance with score calculations of the HOOS score. Raw scores are then transformed to a 0-100 scale, with zero representing extreme hip and/or groin problems and 100 representing no hip and/or groin problems, as common in orthopaedic scales. Scores between 0 and 100 represent the percentage of total possible score achieved. An aggregate score is not calculated since it is regarded desirable to analyze and interpret the different dimensions separately. Data was collected from the players playing on different positions according to the questionnaire.

2.6 Data Analysis

Descriptive Variables were presented as mean± SD. As the dependent variables (HAGOS) did not show a normal distribution, non-parametric statistics were used for all analyses. Data was meaningfully assorted through calculation of Mean, Standard Deviation, ANOVA. “ANOVA” test was used to investigate effect of playing position on the subscales of HAGOS. The level of significance for all statistical tests was set at $p < 0.05$ followed by least significant difference test for comparisons in case of significance. The level of significance for all statistical tests was set at P-value less than 0.05.

3. RESULTS

Data was meaningfully assorted through calculation of Mean, Standard Deviation, ANOVA. The percentage distribution score for pain subscale of HAGOS in the positions were as follows Center (12%), Shooting Guard (16%), Point Guard (26%), Small Forward (27%) and Power Forward (19%).

TABLE 1
DESCRIPTIVE STATISTICS OF PAIN SUBSCALES OF HAGOS

Variables	Mean	SD	Median	Maximum	Minimum	Range	N
Age	22.02	1.94	23	26	19	7	100
Years of Playing	5.86	1.17	6	8	4	4	100
Playing Hours per Week	11.37	2.02	12	19	8	11	100
Symptoms	47.90	10.96	46	71	21	50	100
Pain	46.10	14.29	45	70	13	58	100
ADL	43.25	19.36	40	70	5	65	100
Sport/Rec.	41.82	16.12	41	66	9	56	100
PA	49.00	15.56	50	75	25	50	100
QOL	47.05	16.19	50	70	10	60	100
Overall Score	45.41	13.92	43	66	22	45	100

The above table 1 denoted the descriptive scores according to demographic variables of ages of the groups. There was no significance difference between groups on the HAGOS subscales with the age, years of playing and playing hours per week variable of the groups. The Means \pm SD value of the Symptoms was 47.90 ± 10.96 , Pain was 46.10 ± 14.29 , ADL was 43.25 ± 19.36 , SPORT/REC was 47.90 ± 16.12 and PA was 49 ± 16.19 and QOL was 45.41 ± 13.92 .

TABLE 2
COMPARISON OF PLAYING POSITIONS AND HAGOS OVERALL SCORE

Variables	Positions	Mean	SD	N	F -ratio	P Value	Result
Overall Score	Centre	26.29	2.83	20	646.935	0.000	Significant
	Shooting Guard	35.84	2.61	20			
	Point Guard	59.19	2.35	20			
	Small Fwd	62.00	2.53	20			
	Power Fwd	43.74	3.01	20			

Table No.2 shows the comparison of Overall Score of HAGO Samong Playing Position. The comparison of Playing Positions is being measured. The Mean \pm SD of the Overall Score was 26.29 ± 2.83 of Centre position, 35.84 ± 2.61 of Shooting Guard, 59.19 ± 2.35 of Point Guard, 62.00 ± 2.53 of Small Fwd and 43.74 ± 3.01 of Power Fwd. The result was statistically significant at $p < 0.05$. other.

TABLE 3
COMPARISON OF PLAYING POSITIONS AND HAGOS PAIN SUBSCALE

Variables	Positions	Mean	SD	N	F Test	P Value	Result
Pain	Centre	27.25	5.84	20	157.847	0.000	Significant
	Shooting Guard	36.88	5.55	20			
	Point Guard	58.75	6.31	20			
	Small Fwd	62.75	4.72	20			
	Power Fwd	44.88	3.49	20			

Table No.3 shows the comparison of Pain Subscale of HAGOS among Playing Position. The comparison of Playing Positions is being measured. The Mean \pm SD of the Pain was 27.25 ± 5.84 of Centre position, 36.88 ± 5.55 of Shooting Guard, 58.75 ± 6.31 of Point Guard, 62.75 ± 4.72 of Small Fwd and 44.88 ± 3.49 of Power Fwd. The result was statistically significant at $p < 0.05$. other.

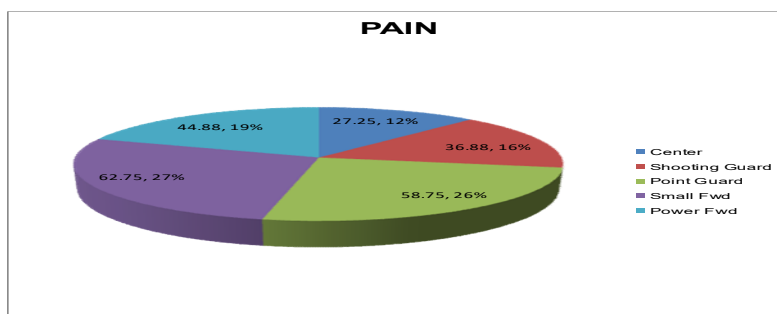


Fig 1. Pie-chart presentation of pain percentage in Playing Position with 0 representing severe pain and 100 representing no hip/groin pain.

4. DISCUSSION

The purpose of this study was to investigate if position of the player in the court influences the incidence of groin pain in basketball. The data was analyzed for the comparison between the playing positions using HAGOS (The Copenhagen Hip and Groin Outcome Score). The percentage distribution score for pain in the positions were as follows Center (12%), Shooting Guard (16%), Point Guard (26%), Small Forward (27%) and Power Forward (19%). Thus presenting maximum pain distribution in Centers followed by Shooting Guard, Power Forward and minimum in Point Guard and Small Forward. The score for subscales of HAGOS for the Center position included Symptoms (21%), Pain (17%), ADL (12%), Sport/Rec (11%), PA (23%) and QOL (16%). The score of HAGOS for position of Shooting Guard included Symptoms (21%), Pain (17%), ADL (14%), Sport/Rec (15%), PA (17%) and QOL (16%). The score for position of Point Guard included Symptoms (16%), Pain (16%), ADL (17%), Sports/Rec (16%) and QOL (17%). The score for position of Small Forward included Symptoms (16%), Pain (17%), ADL (18%), Sports/Rec (15%) and QOL (17%). The score for position of Power Forward included Symptoms (17%), Pain (17%), ADL (15%), Sports/Rec (16%) and QOL (19%).

The findings demonstrated higher frequency of groin pain in players positioned at center position in the court followed by shooting Guards and Power Forwards. Centers are responsible for shots within the key, which involve disputes for defensive and offensive rebounds and shots that require the use of brute force when varying for space (**Meeuwisse et al.2003**)

Jamie (1998) stated that the centers are often the tallest players on the team, and they are preferred to have high muscle and body mass. Their position requires using height to score and defend closer to the basket. **Franciele et al. (2013)** mentioned that centers and shooting Guards which are the taller athletes reported more injuries than shorter athletes as they are the athletes with offensive functions and play closer to the basket. Thus, their greater height is needed in order to perfect the handling of rebounds and score a field goal. These actions also require greater physical contact, which predisposes these players to groin and hip pain, therefore explaining the greater occurrence of injuries among taller players.

In this study shooting Guards accounted for the second most vulnerable position to groin pain and injuries after centers. Shooting Guards are responsible for the preparation of the shot and therefore play more in terms of volume, blending agility, speed strength, and Power. As decisive offensive players, Shooting Guards suffer more checking which explain more occurrences of injuries. Groin injuries occur due to abrupt flexing and rotational movements in the hip joint and groin with rapid changes of direction and high torqueing. As a consequence, the fascias as well as musculoskeletal structures of the thigh and caudal abdominal musculature are strained (**Weber et al.2010**).

The study by **Moriera et al. (2003)** demonstrated that individual characteristics of the players are related to the occurrence of injuries. The biotype of players is considered to be another common determining factor regarding the position played on the court. Regarding body mass, a greater frequency of injuries occurred among heavier athletes. Point Guards normally play further away from the net and consequently execute fewer jumps and absorb less impact. Thus, the dynamics of this position does not explain the greater occurrence of players injury among heavier Point Guards; however, body weight is no less an important factor with regard to occurrence of injuries among these players.

Centers, on the other hand, need greater weight for blocking and occupying space close to the basket during offensive and defensive rebounds, the absorption of impact during the constant jumping and landing promotes the occurrence of injuries among heavier players.

Our results suggested that game location could influence differently the performances of. The findings of this study confirmed the HAGOS as a responsive measure of hip and groin disability outcome and injury status in this population, specifically in the pain and physical activity subscales. (Thorborg et al. 2015)

5. CONCLUSION

The present study concludes that Groin Pain is prevalent in basketball players and it depends on the position of the player in the court. The centers present the highest score of pain distribution in groin region followed by shooting Guards and Power Forwards. With the awareness of the types of injuries that occur in groin region, injury prevention strategies focused on these will be beneficial to players and teams at all levels of competition. HAGOS is a suitable tool to identify groin pain in athletes with other subscales including quality of life, symptoms, physical activity, ADL and sports and recreation.

6. SIGNIFICANCE

Basketball is a sport which requires high intensity activities such as jumping, turns, dribbles, sprints, screens and low intensity activities such as walking, stopping and jogging. The constant practice of this sport involves repetitive motor actions and excessive joint load, which increases vulnerability to injuries. There is a lack of information to enable the determination of association between sports injuries and position in court. Studies have shown that most common injuries in basketball affect the lower limbs. Groin injuries accounts for 2% to 5% of sports related injury. Inadequate evaluation of these injuries can result in premature ending of competitive careers. Therefore, proper evaluation and appropriate treatment of groin pain particularly in a competitive athlete are paramount and can be very challenging. So, the current study estimates the percentage of groin pain cases according to their playing position, it will be able to identify at risk individual. Early recognition will reduce the number of players suffering from the long term effect associated with groin pain. It will help to establish physiotherapy interventions for treatment and prevention in field in of basketball at national and international level.

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**COMPARATIVE EVALUATION OF SUPERSTITIOUS
BEHAVIOUR AMONG COLLEGIATE MALE
STUDENTS BASED ON PARTICIPATION
IN COMPETITIVE SPORTS**

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ABSTRACT

The present study aimed to compare superstitious behaviour between sportspersons and non-sportsperson students enrolled in UG and PG program in colleges. The researcher decided to select 100 male intercollegiate sportspersons for this study. It was also decided to select 100 non-sportsperson college students. The age of the selected subjects was 18 to 25 years. Purposive sampling was used to select 200 subjects from various colleges operational in Chhattisgarh. The superstitious behaviour in the selected subjects was determined by a scale developed by Dubey and Dixit (2011). It consists of 40 statements and three alternatives are given for each statement. A scoring pattern of this scale suggests that a high score means more superstitious behaviour. The data were analysed with the help of an independent sample 't' test and it was observed that there was a statistically non-significant difference in superstitious behaviour of sportspersons and non-sportsperson college students. It was concluded that participation in sports is not a strong enough variable that influences the superstitious behaviour of male students enrolled in UG and PG programs in colleges.

Keywords: Superstitious behaviour, college students, participation in sports

1. INTRODUCTION

Every culture spread in different demographic areas has its superstitions. Superstitious beliefs are part of human life for ages. This behaviour is practiced in every culture and dates back to ancient times (**Jahoda, 1969**). **Vyse (2013)** opined that the superstitious behaviour gives a mental piece regarding an uncertain future that he will succeed by doing certain acts or rituals. According to **Vyse (2013)** superstitious behaviour originate from a belief that the outcome of an event can be controlled with some rituals or acts repeatedly. **Brevers et al. (2011)** felt that superstitious behaviour and beliefs create an illusion regarding control over the certain situation or achieving set goals. **Schippers and Van Lange (2006)** defined superstitious behaviour as those acts or rituals that are considered as a coping mechanism to control anxiety and tension for success in that particular work. So, it is obvious that superstition can not be defined through a certain definition. Superstition is considered irrational and **Skinner (1948)** thought that there was no relation between superstitious behaviour and the certainty of that event to occur in favour. Elaborating the superstitious behaviour, **Jahoda (1969)** propagated that it is more of irrational thinking and not involving the decision-making process. Some of the common superstitions are keeping the fingers crossed or touching the wood for better and safe outcomes (**Newport and Strausberg, 2001; Goodal, 2010**).

Although superstitious practices can be easily observed in day to day life, it is more commonly seen in the sporting field. These superstitious beliefs are often performed by athletes during a match (**Bleak and Frederick, 1998**). Before the start of a match, a player performs a certain physical movement or putting his left foot on the ground every time he steps in the playing arena can be considered as superstitious behaviour. Scientifically all these acts are considered irrational, athletes, coaches and even fans perform certain superstitious physical movements for favourable outcomes. The great Portuguese soccer player Ronaldo always enter the playing field by putting his right foot forward while tennis player Serena Willaims always tap the ball five times before serving. There are numerous examples such as famous Australian cricketer Steve Waugh keeping a red handkerchief as a lucky charm while playing. **According to Dan et al. (2011)**, superstitious behaviour is not associated with success in sports but it gives athletes a false illusion that things are under control. **Schippers and Van Lange (2006)** believes that superstitious acts, rituals or behaviour have nothing to do with the outcome of a sports event but it releases tension and acts as a facilitator in sports performance. The basic core of sports competition is the uncertainty of results (**Guttman, 1978**). Hence there is no surprise that an athlete may be superstitious because when two athletes of the same ability or two teams of the same skill sets compete, the results are always uncertain. Research under sports psychology scientifically suggest that due to tension and anxiety associated with competitive sport, superstitious acts take place (**Becker, 1975; Brevers et al., 2011; Schippers & Van Lang, 2006**). Apart from this researchers namely **Coffin, 1971; Gmelch, 2003; Gregory & Petrie, 1975, Wright and Erdal, 2008** have pointed some common superstitious behaviour. Sports psychologists such as **Roenigk (2010)** stated that superstitious behaviour act as a psychological placebo in the athletic community. Some athletes practice superstitious acts so have that extra psychological edge in the form of concentration, focus and coping with stress.

Just like any other part of this world, superstitious behaviour is common in India. The superstition about the beneficial effect of lemon chilli to avert evil force to witch-burning is widely practised in India. A study published in The Hindu Business line revealed that 61% of employees in India are superstitious. Generally carrying a luck charm, knocking or touching the wood, keeping the fingers crossed at the time of declaration of results or try not to walk under

the ladder are some of the commonly practised superstitions (Epstein, 1993, Wiseman and Watt, 2004, Keinan, 2002 Pole et al. 1974). In sports Ciborowski, 1997, Van Raaalte et al., 1997, Todd and Brown, 2003, Schippers and Van Lang, 2006) Brevers et al., 2011, Dömötör, 2016 and Katerina et al., 2017 have conducted extensive research on superstitious behaviour and pinpointed some of the variables such as type of sport, nature of the sport, strong opponent, locus of control, degree of difficulty in executing sports skill etc. Although considerable research has been conducted on superstitious behaviour, a comparison of superstitious behaviour between college students has not been conducted in the light of their participation in competitive sports. Hence the present study was planned.

The present study aimed to compare superstitious behaviour between sportspersons and non-sportsperson students enrolled in UG and PG program in colleges.

It was hypothesized that the superstitious behaviour among college students will vary significantly based on their participation in competitive sports.

2. METHODOLOGY

2.1 Sample

To conduct the study 100 male intercollegiate sportspersons who participated in various team and individual sports events were selected from colleges operational in Chhattisgarh. To fulfil the objectives of the present study, 100 non-sportsperson college students enrolled in various UG and PG courses were also selected. The age of the selected subjects was 18 to 25 years. Stratified sampling technique was used to select 200 subjects.

2.2 Tools

2.2.1 Superstitious Scale:

The superstitious behaviour of college students athletes and non-athletes were assessed with the help of a reliable and valid scale constructed by Dubey and Dixit (2011). The scale had 40 statements with 03 alternatives. A higher score on this scale denotes enhanced superstitious behaviour.

2.3 Procedure:

1. 100 male intercollegiate sportspersons and 100 male non-sportsperson enrolled in various UG and PG courses were selected.
2. The superstitious scale was administered to each subject as prescribed by the author of this scale.
3. The scoring was carried out according to the instructions given in the authors manual.
4. Independent sample 't' test was used to compare superstitious behaviour in two study groups and the data analysis in table 1.

3. RESULTS AND DISCUSSION

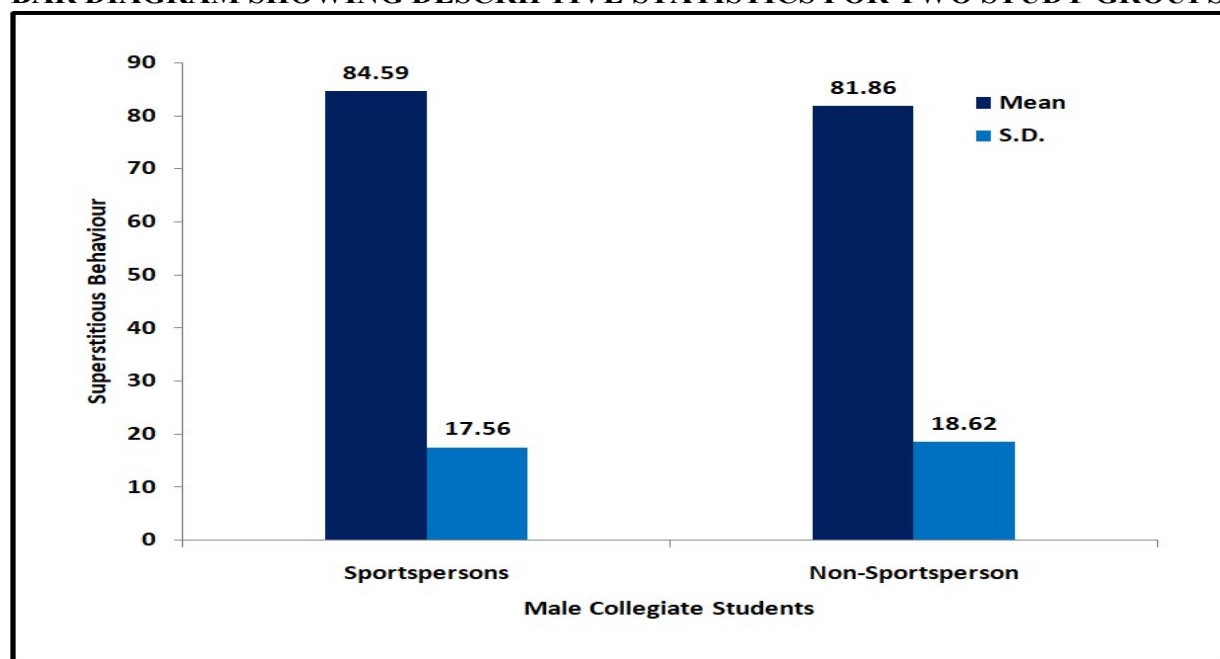
TABLE 1
COMPARISON OF SUPERSTITIOUS BEHAVIOUR BETWEEN INTERCOLLEGIATE MALE SPORTSPERSONS AND NON-SPORTSPERSONS ENROLLED IN UG AND PG COURSES

Variable	College Students enrolled in UG and PG courses						t
	Sportspersons			Non-sportsperson			
	N	Mean	SEM	N	Mean	SEM	
Superstitious Behaviour	100	84.59	1.755	100	81.86	1.862	1.06

t(df=198) = 1.97 at p<.05 and 2.60 at p<.01

A perusal of statistical figures given in table 1, it was found that the mean score on the superstitious scale for male intercollegiate sportsperson was 84.59 while the mean scores for non-sportsperson male college students was 81.86. The standard error of mean for a group consisting of male intercollegiate sportsperson was 1.755 whereas the standard error of mean for non-sportsperson male college students was 1.862. The calculated $t=1.06$ did not meet the criteria of statistical significance because the table value at $t(df=198) = 1.98$ is greater than the calculated value. Data analysis indicated that the superstitious behaviour among college students did not vary significantly based on participation in competitive sports.

FIGURE 1
BAR DIAGRAM SHOWING DESCRIPTIVE STATISTICS FOR TWO STUDY GROUPS



4. DISCUSSION

Results indicate a statistically non-significant difference in superstitious behaviour of collegiate students based on their participation in sports. **Gregory and Petrie's (1972)** reported similar results in their study. This study was conducted on University students of Western Ontario. The authors found that both athletes and non-athletes believe in carrying a lucky charm or doing certain physical movements. Like collegiate sportspersons, students with no participation in sports tend to cross their fingers before the announcement of results or wait for some time if the cat cuts the way. Hence the results of the present study are consistent with the reported findings in the research literature.

5. CONCLUSION

Based on results, it can be concluded that superstitious behaviour in male collegiate sportsperson and non-sportspersons did not differ and prove that the participation in sports is not a strong enough variable that influences the superstitious behaviour of male students enrolled in UG and PG programs in colleges..

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EFFECTS OF WEIGHT TRAINING ON PERFORMANCE OF LONG JUMPERS

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ABSTRACT

The purpose of the study was to determine the effects of Weight training on performance of Long Jumpers. The subjects for the study were 20 male students studying in C.P.Ed course and were assigned at random to two groups (n=10) each. Group A trained with Weight Training, Group B acted as control. The training period for Weight Training experimental group underwent their respective training three days per week for eight weeks in addition to their regular activities. The data was collected in the beginning and at the end of 8 weeks experimental period in terms of pre and post test. A systematic and scientific training schedule was adopted for all the subjects and loading principles in mind. t-test was applied to find out the differences in pre and post test scores of Group A, and B. The significance was tested at 0.05 levels. It was found that Weight Training is effective Training for long jumpers.

Keywords: Weight Training., long Jump, athlete, Training group, Control Group

1. INTRODUCTION

Generally weight training should display its effect on body structure and ability of the players. Now modern weight equipment's. multi-gym and isokinetic machines are available for the development of specific strength for specific group of muscles for specific games (**Tim & Jay 1982**). For players of big games such as Football, Volleyball, Hockey, Cricket, Softball etc., almost all muscles of the body need to be very powerful and active. For other sports such as running, jumping and throwing, players can improve their performance through weight training. In this study an attempt is made to compare their training modalities.

Goal of the long jumper needs to develop the foremost economical coaching technique to maximise performance. Resistance training improves strength however not speed. The plyometric exercises train the quick muscle fibers and also the nerves that activate them yet as reflex and therefore it's one in all the first tools that enhance each i.e. strength and speed. They concluded that identification of plyometric training program as a lot of helpful and resultive than free quality exercise training program and have positive effect on long jump performance. (**Sharma, Saiyad & Nandwani, 2013**)

Long jump performance is, among different factors, extremely addicted to the athlete's ability to get spare vertical speed throughout take-off. For an exact time on the take-off board the impulse-momentum relationship states that vertical speed is directly proportional to the vertical force applied to the body centre of mass and reciprocally proportional to the athlete's body mass. A rise in an athlete's strength is assumed to be followed by a rise in body mass. This study investigated however strength gains as well as the corresponding body mass gains influenced jump length. The results showed that when an initial increase in jump length any will increase in strength and body mass didn't have an effect on performance (**Ssrensen, H., Simonsen, E.B. & van den Bogert, A.J. (1999a &b.)**)

Carlson, Magnusen, & Walters (2009) examined the consequences of weight-training with weights and plyometrics plus training with weights and also with vertical jump. Subjects were thirty seven physical activity athletes distributed in 1 of 4 training groups: i.e. strength, strength-plyometric, strength-without arms, and strength with arms. Every training group completed a 6-week experimental training program. there have been no applied math will increase in pre-post vertical jump among all group of teams. there have been no vital variations for post-test vertical jump between the four training group of teams. Pre- and post-test result sizes were lowest among all group of teams. The findings of this study demonstrate that there's no distinction in vertical jump among strength training, plyometric training and jump training over a 6-week time frame.

Since the 1960, coaches and scientists round the world are finding out coaching means that and strategies to enhance the storage and employ of elastic potential energy in muscle throughout the stretch-shortening cycle. The alleged plyometric exercises are able to try this. they're outlined as exercises that "activate the stretch-shortening cycle of skeletal muscles, causing the elastic, reflex and mechanical potentiation" (**Moura, 1988**).

There is a growing scientific awareness among coaches and investigators (**David & Helen 1985**). Training in games and sports is no longer a myth and it does not appreciate casual approach, but it provides opportunities for scientific application and verification. Training has been accepted as a high specialised science (**Doris & Richard 1973**). Strength is one of the most important components of physical fitness, which affects the performance in all activities in some form or the other. Development of

strength is essential for power and speed. Strength is a complex factor which depends upon both the stimulus given by the nervous system and upon the capacity of the muscles for contraction, their size and shape. Improvement in strength is brought about by the principle of over loading through resistance exercises and also through repetition of specific movements of the muscles especially of those which are involved. Weight training is today considered as one of the principle methods of securing strength, but this requires the guidance of a coach or expert (**Gene 1962**).

The ability to get lower body power could be a key part for fulfillment in several sporting activities (**Baker 1995; Haff and Potteiger 2001; Harman et al. 1990; Harris et al. 2000; Kemp 1997; Lyttle et al. 1996; Stone 1993**). This can be very true for athletes who requires activities that need sprinting and jumping (**Lyttle et al. 1996**).

Numerous forms of strength-training modalities are utilised so as to enhance lower body power, as may be measured by vertical jump. These modalities are classified into general, special, and specific. General strength-training exercises are utilized to extend the largest strength of the muscles utilized in jumping (**Baker, 1996**).

Bosco (1985a&b) detected a negative relationship between the event of largest strength and special strength in elite Italian jumpers. even supposing he didn't counsel eliminating largest strength training. He suggested that the limiting the length of this amount of training should be for a most of eight weeks.

Athletes engaged in power-based activities like long jump typically complement activity specific training with strength training. whereas the target is increased strength, this may typically be among increased body mass. there's general agreement within the literature that approach speed is that the single most significant determinant for fulfilment in long jump (**Hay, 1993**).

2.METHODOLOGY

2.1 Sample

20 students of Shri Chhotubhai Purani Vyayam Mahavidyalay, Rajpipla (Gujarat) age ranged between 18 to 22 were selected for this study. Random group design was adopted to equally divide the subjects in two groups consisted 10 subjects in each group.

2.2 Research Design.

Experimental group - A Weight Training, and B control group. Group A was assigned to Weight training with Leg Press, Leg Flexion and Extension, Half Squat, Hill Raise, Knee Ups with Bar and Jump with Weight exercises. Group B acted as control and did not participate in any kind of training.

2.3 Testing Procedure

Prior to initial testing, each subject was familiarized with testing protocol. The data was collected for both the two groups before starting experiment to Weight Training group in terms of pre test. Post data were collected after 8 weeks of imparting the Weight training for group A. Group B was also tested after the completion of 8 weeks.

2.4 Training Protocol

During the training period, the experimental group underwent their respective training Program three days per week (alternate days) for eight weeks in addition to their regular activities. Every day, the work out lasted for 90 minutes approximately including warming up and cool down periods. The Weight Training Program involved

Leg Press, Leg Flexion and Extension, Half Squat, Knee-Up with Bars, Heel Raise and Jump with Weight.

The load was progressively increased. All training sessions for experimental group was fully supervised and all the subjects remained present during the training period. None of them reported any injury. However, muscle soreness was reported in the early weeks which subsided later and there were no dropouts in the study.

2.5 Statistical Analysis

The data collected from the two groups prior to and after experiment were statistically examined for significant results were obtained ($P < 0.05$), t-test was used to find out Weight Training is effective or not for long Jumpers.

3. RESULTS

This chapter presents the data concerning long jump performance collected on 20 subjects. t-test was applied to find out significance of differences between pre-test and post-test means. The results pertaining to t-test for long jump performance is given in table – 1 and it is evident that t- ratio obtained for experimental group A, was 3.32. The obtained t-ratio for control group was 0.53. As the required ‘t’- ratio for significance was 2.26 at 0.05 level of confidence, therefore, Weight Training Group was found significant whereas the control group was found insignificant.

TABLE- 1
SIGNIFICANCE OF DIFFERENCES BETWEEN PRE-TEST AND POST-TEST MEANS
OF WEIGHT TRAINING AND CONTROL GROUP IN
LONG JUMP PERFORMANCE

Group	Pre-Test Mean	Post-Test Mean	Mean Difference	S.D.	t- ratio
Weight Training	4.44	4.65	0.21	0.20	3.32*
Control	4.49	4.46	0.03	0.17	0.53

Significant level 0.05 (9) 2.26

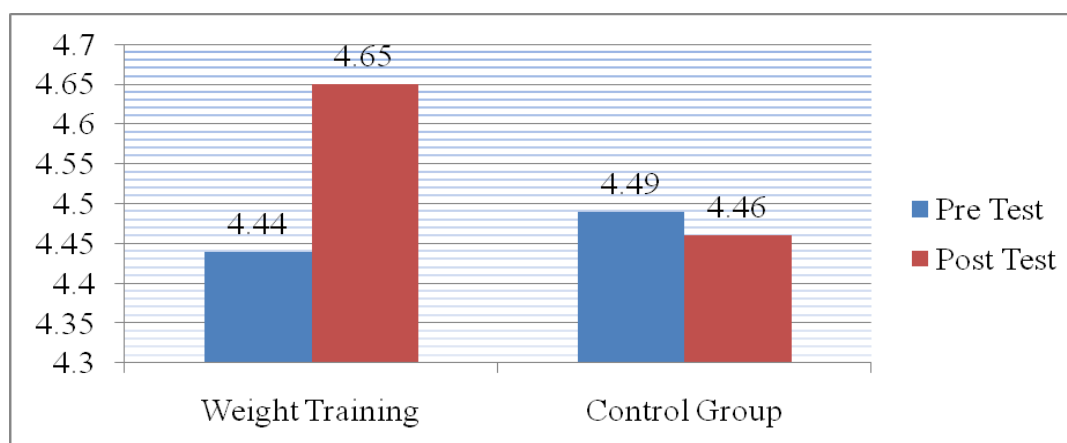


CHART-1: PRE AND POST TEST MEANS OF WEIGHT TRAINING GROUP AND CONTROL GROUP

4. CONCLUSION

On the basis of analysis of data and within the limitation of present investigations the following conclusions may be drawn.

1. The improvement observed in performance of Long jumpers after 8 weeks training program of Weight Training.
2. There was no improvement observed in the control group

5. ACKNOWLEDGEMENTS

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**A COMPARATIVE STUDY ON SELECTED FITNESS
VARIABLES OF TRIBAL HANDBALL AND
VOLLEYBALL PLAYERS**

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ABSTRACT

Sports by their very nature are enjoyable, challenging, all absorbing and require a certain amount of skill and physical condition in order of human values. Ball games are one of the most popular of all the common games and sports. Handball is very fast by its nature and demands a high level of specific fitness. It is a game of constant actions and requires continuous adaptations to the changing situation by the team as well as by individual players. Volleyball has a requirement for a great deal of planned program to highly trained teams. The purpose of the study was to compare the selected fitness variables between tribal Handball and Volleyball players of Bankura district. Forty (40) male student players of Gobinda Prasad Mahavidyalaya and Ramananda College (20 Handball and 20 volleyball players) were selected as subjects. The average age of the subject was 19.2 years. The performance variables such as speed, strength, agility and cardiorespiratory endurance were measured with a standard test. Product moment correlation was used to establish reliability. t-test was used in order to find out the significant differences between the selected variables of Handball and Volleyball players. The significant differences were observed at 0.05 level in speed, leg explosive strength, agility and cardiorespiratory endurance. No significant difference was seen in Arm and shoulder strength.

Keywords: Speed, Strength, Agility, Cardio respiratory, Variables.

1. INTRODUCTION

Sports by their very nature are enjoyable, challenging, all absorbing and require a certain amount of skill and physical condition in order of human values. Conquest in the field of sports hold a unique place. Out of many important prerequisites' factors for top performance, physical fitness and different forms of activity has been regarded as very important factors of the fundamental patterns of living and performance for every creature that has ever lived on earth. For this reason, the condition of a person's body must have always been of great concern. Skill plays an important role in the performance of an individual. **Singer (1975)** explain that motor talent could be a muscular movement or motion of the body needed for the prosperous execution of a desired act.

Handball games is very fast by its nature and demands a high level of specific fitness. It is game of constant actions and requires continuous adaptations to the changing situation by the team as well as by individual players. Volleyball also requires a great deal of planned deception on the part of the two highly trained teams. Thus, Volleyball players require a wide range of physical and physiological characteristics and abilities along with a broad-based specific training for successful performance. The physical abilities that are required for volleyball players to perform optimally are; muscular power, strength and speed of movements, flexibility and agility. To satisfy the demands of the volleyball skills, the fast motor units will be recruited and energy will be produced through anaerobic metabolism (**Fox and Mathews, 1974**).

Singh (2019) in a study have clearly indicated that handball players found better in the components such as speed, cardiovascular endurance, muscular strength, whereas basketball players found better in agility. **Pooja et.al (2018)** in their study concluded that no significant difference in leg explosive power and shoulder strength between handball and volleyball players but handball players were better in both variables. In another study **Singh (2017)** found significant difference in the circulatory, respiratory endurance and abdominal muscular endurance of handball and volleyball players and there was no significant difference were found in agility and leg explosive power, arm/shoulder muscular endurance and speed between handball and volleyball male players. **Kumar (2017)** have found no significant differences for the variables of sit ups and 600-meter run but found significant differences between pull ups, shuttle run and 50-meter run. **Dhanasekaran et.al (2016)** in their study found no difference in speed, agility, and arm strength among the volleyball, handball and basketball players but in explosive power the volleyball players obtained the highest value when compared to basketball and handball players.

Ibrahim and Azeem (2010). discovered that good speed and agility may improved the defensive ability among handball players. In the same way, good explosive power, cardio-respiratory endurance and flexibility can improved the passing ability. The dribbling ability can be developed through good speed and agility. **Manmeet et al, (2010)** concluded that the university level female students from rural area found stronger in strength, endurance, agility and speed their counter urban students. University level female students found stronger and more in flexibility and their weight than their counter part rural students. **Singh (2015)** revealed that statistically significant differences were found between handball and volleyball players of inter-university level on flexibility, explosive strength & endurance, agility components. He suggested that same study can be replicated on large sample of national level male and female players of both sports.

There are a lot of differences between tribal and non-tribal in every aspect of life i.e., customs, rituals of living etc. Therefore, it is possible that there may be greater difference in

body composition, haemoglobin content, blood pressure etc. Between tribal and non-tribal boys. There is a popular belief among the common people of India that tribal and non-tribal differ in their speed, strength, endurance, agility and they should be provided with separate physical activities. Apart from the difference between tribal and non-tribal folk there may be differences with respect to games also.

2. METHODOLOGY

2.1 Selection of Subjects

For this study 40 male college level tribal players (20 Handball and twenty Volleyball players) of Bankura district in Bengal were selected as the subject. The average age of the subject was 19.2 years ranging from 18 -21 years.

2.2 Selection of Variables

On the basis of experts' opinion and available literature considering the feasibility of equipment the following variables were selected-

- (A) Personal variables: Age, height, weight and BMI
- (B) Performance variables
 1. Speed,
 2. Arm and Shoulder strength,
 3. Leg explosive strength,
 4. Agility and
 5. Cardio respiratory endurance.

2.3 Procedure

The data pertaining to the speed, arm and shoulder strength, leg explosive strength, agility and Cardio-respiratory endurance collected by administering the specific tests and measurement procedures. Data were collected on two groups of 20 handball and 20 Volleyball players of two different colleges. Before administering the test, the purpose of the study was explained to the subjects and the investigator solicited their corporation which all of them readily agreed to extend.

3. RESULTS AND DISCUSSION

To find out the significant differences between handball and volleyball players, in performance variables i.e. Speed, Arm and Shoulder strength, Leg explosive strength, Agility and Cardio respiratory endurance, mean, SD and t-ratio (Verma, 2000) were computed and data are presented in Table 1 & 2.

TABLE 1
DESCRIPTIVE STATISTICS OF PERFORMANCE VARIABLES OF HANDBALL AND VOLLEYBALL PLAYERS

Performance Variables	Mean ± SD	
	Handball Players	Volleyball Players
Speed	6.74 ± 0.31	7.08 ± 0.29
Arm and Shoulder Strength	6.35 ± 1.76	6.40 ± 1.71
Leg Explosive strength	2.23 ± 0.28	1.98 ± 0.18
Cardio respiratory Endurance	2.38 ± 0.25	2.84 ± 0.26
Agility	11.46 ± 0.36	11.83 ± 0.58

From the Table 1, it was observed that the mean and SD value of Speed, Arm and Shoulder strength, Leg explosive strength, Agility and cardiorespiratory endurance of Handball and Volleyball player are 6.74± 0.309, 7.08 ± 0.29, 6.35 ± 1.76, 6.4 ± 1.71, 2.23 ± 0.284, 1.98 ±

0.184, 11.46 ± 0.360 , 11.83 ± 0.579 , 2.38 ± 0.25 and 2.84 ± 0.26 respectively. The mean scores of all the performance variables has been depicted in Figure 1.

FIGURE 1

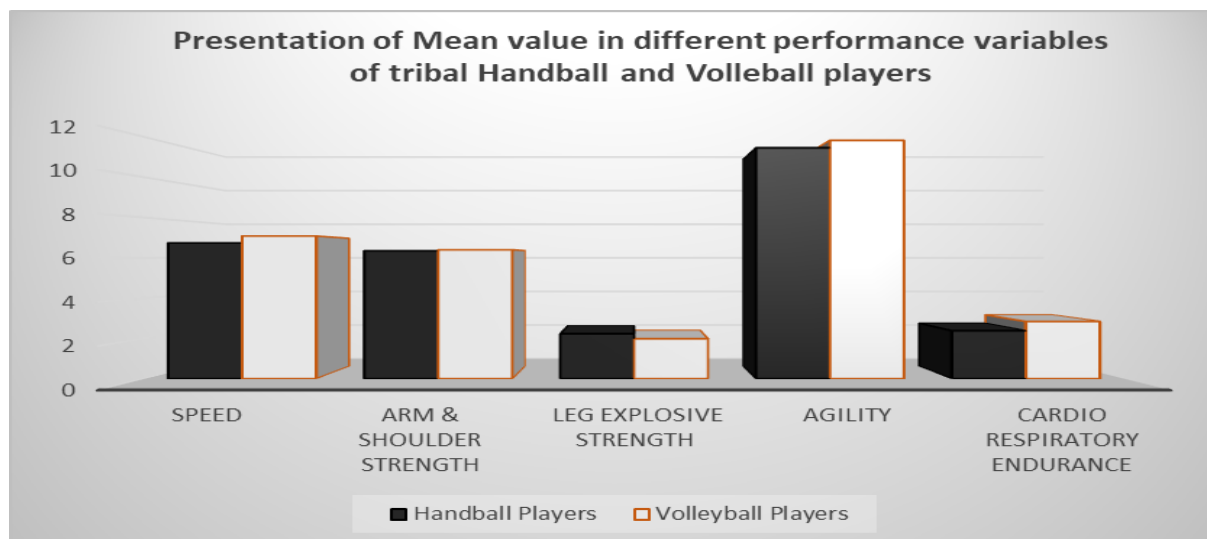


TABLE 2
SIGNIFICANCE OF DIFFERENCES OF MEAN IN DIFFERENT PERFORMANCE VARIABLES OF TRIBAL HANDBALL AND VOLLEYBALL PLAYERS

Variables	N	Mean	MD	σ DM	t- ratio
Speed	40	6.74 7.08	0.34	0.09	3.45*
Arm and Shoulder strength	40	6.35 6.40	0.05	0.06	0.88
Leg explosive Strength	40	2.23 1.98	0.25	0.08	3.33*
Agility	40	11.46 11.83	0.37	0.16	2.32*
Cardio-respiratory endurance	40	2.38 2.84	0.46	0.08	5.61*

*Significant at 0.05 level

$t_{.05 (38)} = 2.02$

From the Table 2 it was observed that the significant differences were found on speed, leg explosive strength, agility and cardio-respiratory endurance between tribal Handball and Volleyball players at 0.05 level. On the other hand, there was no significant difference on Arm and Shoulder strength between tribal Handball and Volleyball players.

4. DISCUSSION

The results of descriptive analysis clearly indicated that the speed, explosive strength of leg, cardio-respiratory endurance and agility performance variables of college level tribal handball players perceived greater amount in mean values than the college level tribal

Volleyball player. In case of mean scores on arm and shoulder strength, a little bit difference between college level tribal Handball and Volleyball players

To find out the significance of differences between college level handball and volleyball players of tribal region, t-ratio resulted dissimilarity in selected performance variables i.e. Speed, leg explosive strength, agility and cardio-respiratory endurance between college level handball and volleyball players belong to tribal region. But they had similarity on arm and shoulder strength.

5. CONCLUSIONS

From the obtained results and within the limitation of the study the following conclusions were drawn -

1. In case of speed the mean value of college level tribal handball players is found to be better than the college level tribal Volleyball player.
2. In case of Arm and Shoulder strength, the mean value is found to be almost equal of college level tribal Handball and Volleyball players
3. In case of Leg explosive strength, the mean value of college level tribal Handball players is found to be better than the college level tribal Volleyball players.
4. In case of Agility, the mean value of college level tribal Handball player is found to be better than the college level tribal Volleyball players.
5. In case of cardio-respiratory endurance, the mean value of college level tribal handball players is found to be better than the college level travel Volleyball players.

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CASE STUDY ON CRICKET TEAM PREDICTION

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ABSTRACT

Cricket is a game of uncertainties. Love for the game of cricket is increasing day by day. In a country like India, it is more of an emotion. Some players are also considered as god. It's a game that is played between 2 teams of 11 players each into 3 different formats namely Test cricket—the purest form of the game and is also the longest format in all, and it is also this sport's biggest standard. A four innings match, which can last up to 5 days. It is generally referred as the testing of a team's Endurance and agility. One day match -It is a form of limited over match, in which both teams have a quota of 50 overs, team which scores the greatest number of runs wins the match (used to be 60 previously)with the game ending within a day If not obstructed by any environmental issues. T20 match -Twenty20 is the shortest form of the game usually completed within 4 hours. Both teams have a quota of 20 overs to score most numbers of runs to win the match. This paper focuses on finding a solution for cricket team prediction while analyzing team's data as per the conditions of the match that are home/away match, venues and toss decision. It relies on quantitative approach.

Key words: Cricket, prediction, Players, Match, Quantitative approach

1. INTRODUCTION

Cricket, a game of numbers - the runs scored by a batsman, the wicket taken by a bowler, the matches won by a particular cricket team, the number of times a batsman reacted in a certain way to a particular kind of bowling attack, etc. The ability to dig into this game's numbers for both improving performance and analyzing the other factors involved with this game. Cricket analytics provides interesting insights about the game and predictive intelligence regarding game outcomes.

Today, there are plenty of cricket game records and statistics available, e.g., ESPN cricinfo and cricbuzz. There are number of other such cricket databases that are used for cricket analysis using the newest machine learning and prognosticative modelling algorithms

Sports Analytics is a game changer when we talk about how actually these professional games are been played, especially about strategic decision, which previously was primarily done based on "gut feeling" or relativeness to past traditions. Sports Analytics is an enjoying field. Many researchers and companies find NumPy and other Py Data packages like Scikit-learn, SciPy, Matplotlib, and Jupyter easy for their purpose of working on the different models. Similarly, we have developed a model on r language using cricketr package, ggplot2 and dplyr.

Two types of analysis are- 1. Statistical Analysis: This helps in estimating the statistical significance of observational data in the context with various player and game tactics, estimating the game outcome by a generative or static model. Casual analysis and big data approaches are used for tactical analysis. 2. Data Visualization: Data graphing and visualization provides useful insights into relationship between various datasets. Previously, there was only one platform for cricket analytics that was provided by Clarke (1998). A lot of advancements have been done since that time. Advances in computing have provided more tools to exercise huge data sets. The structure of this article contains sections which are mostly independent and focuses on various topics of cricket. The paper concludes with some discussion on how cricket analytics may be heading

Agarwal, Yadav and Mehta (2017), suggested that the relative team strength between the competing teams forms a distinctive feature for predicting the winner. Modeling the team strength boils down to modeling individual player batting and bowling performances, forming the basis of approach used. Career statistics as well as the recent performances of a player have been used to model. Player **Ramakrishnan, Sethuraman, and Parameswaran (2019)** suggested that the relative team strength between the competing teams forms a distinctive feature for predicting the winner. Modeling the team strength boils down to modeling individual player's batting and bowling performances, forming the basis of our approach.

The case study to show data visualization for Sachin Tendulkar using r language using cricket package-

CODE:

```

1  install.packages("cricketr")
2  install.packages("sixer")
3  library("cricketr")
4  Tendulkar<- getPlayerData(35320,dir="..",
5  file="tendulkar.csv",type="batting",homeOrAway=c(1,2), result=c(1,2,4))
6  par(mfrow=c(1,3))
7  par(mar=c(4,4,2,2))
8  batsmanRunsFreqPerf("./tendulkar.csv","Sachin Tendulkar")
9  batsmanMeanStrikeRate("./tendulkar.csv","Sachin Tendulkar")
10 batsmanRunsRanges("./tendulkar.csv","Sachin Tendulkar")
11 battingPerf3d("./tendulkar.csv","Sachin Tendulkar")
12 batsmanAvgRunsGround("./tendulkar.csv","Sachin Tendulkar")
13 batsmanAvgRunsOpposition("./tendulkar.csv","Tendulkar")

```

Outputs

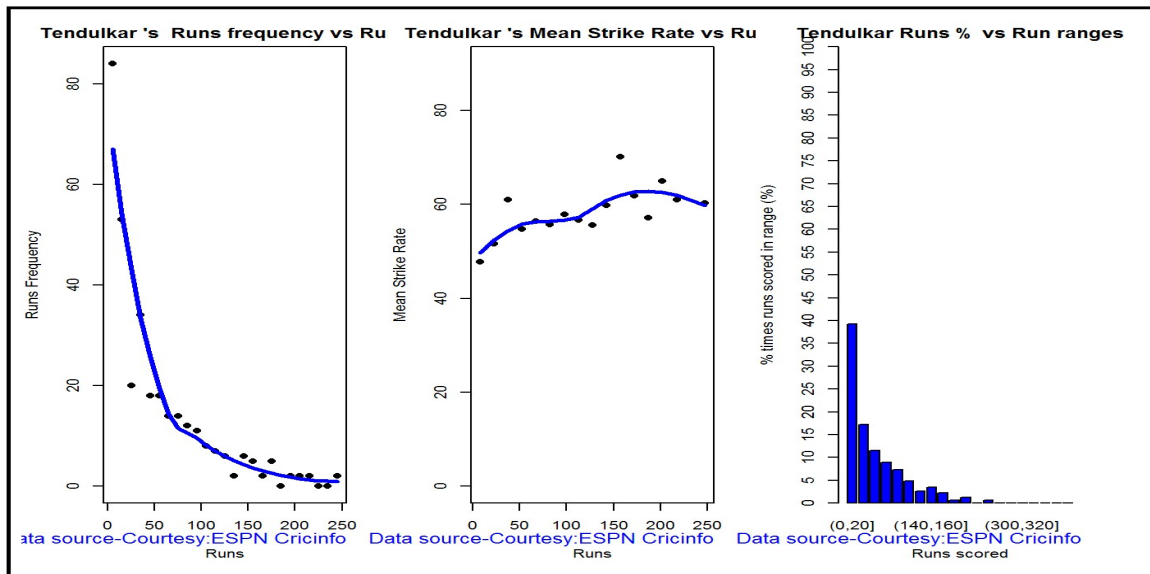


FIG 1.1 OUTPUT FOR LINE 8,9,10

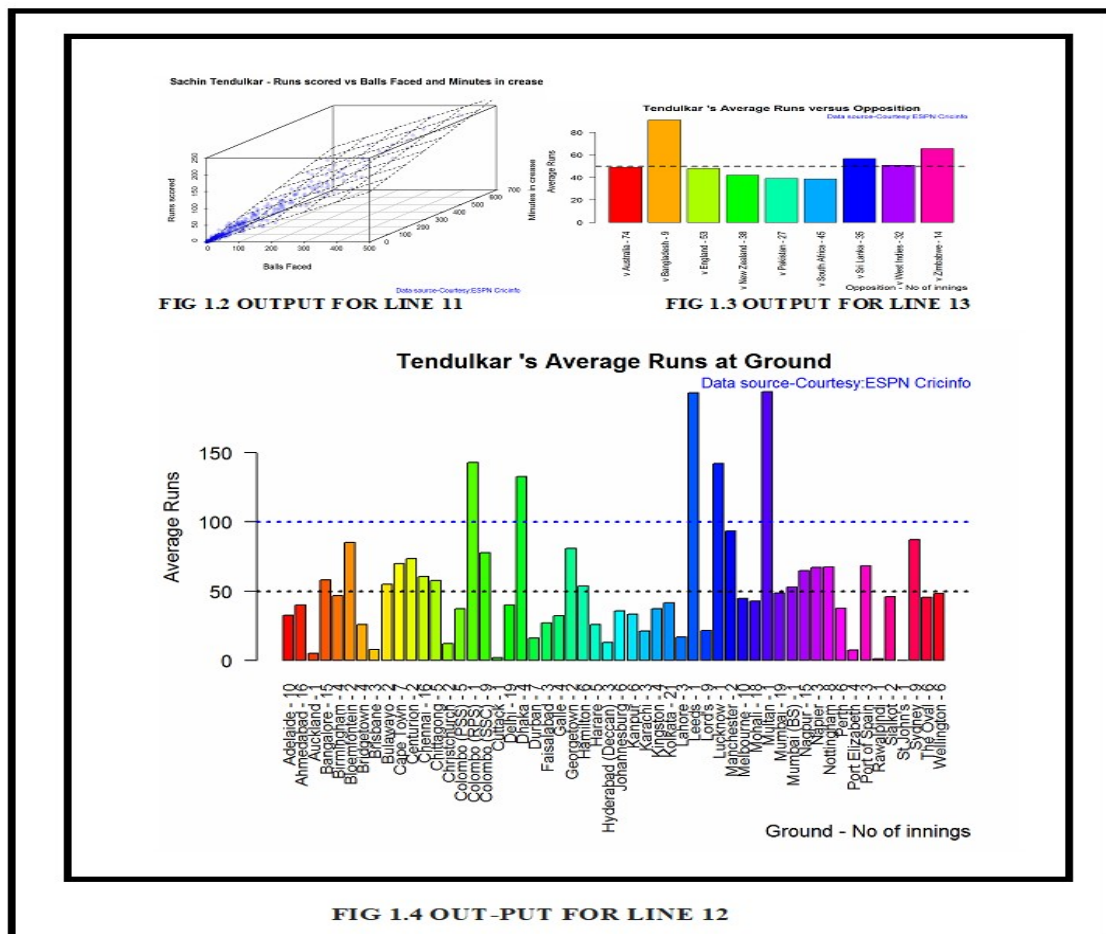


FIG 1.4 OUT-PUT FOR LINE 12

Nimagadda et al. (2018) applied statistical techniques to predict a T 20 match result while the match is in progress. a multiple regression model is developed to prediction purpose Using runs scored per over the innings, different algorithms such as Logistic Regression with multi-variable linear regression and Random Forest used to predict the final result. The software used here is Anaconda and Python libraries like pandas, NumPy and Python to work with the data structure and applying algorithms. The end result found was based on the impact of toss winner and match winner. The predictive model considered the innings score at regular period to found the pattern and predict accordingly. At the data found was satisfactory I.e., slightly above 50%.

Pathak & Wadhwa (2016) found the prediction of the result for matches using data mining techniques. They experimented on predicting the outcome for One Day International format based on various factors such as home ground, toss, innings, fitness of players and other strategies. In addition to the techniques implemented by SV Method was used to predict the result. they came with a tool called COP (Cricket Outcome Predictor), which provides the probability for winning an ODI match. The data understudy was done on all international cricket match played between 2001 to 2015. Results found clearly showed that the classifiers derived by the SVM method performed better than Naïve Bayes and Random Forests methods. SVM obtained accuracy, whereas the accuracy rates of the other methods were around 60%. The COP tool which is developed in R software helps a user to predict the match outcome and the user could analyze between the classifiers. A notable result was observed when COP system was applied on the India vs. Australia series in which Naïve Bayes derived more competitive classifiers in terms of predicting the match outcome.

Jhanwar & Pudi conducted a study to predict the for ODI cricket matches victimization data processing techniques. They investigated the match result victimization team players performance singly in batting and bowling aspects. Initially the potential of all players was understood victimization people career statistics and KNN, Support Vector Machine (SVM), Random Forests, logistical Regression and call trees techniques were applied. To predict the result of the match, the relative strength of every team is studied, in conjunction with the venue of the match and toss result. The accuracy of the KNN model was beyond the opposite models in predicting the game analytics for game results strength of the team players giving virtually 71 accuracy for the ODI match. There was no feature choice concerned during this study.

Kampakis & Thomas (2015) done a study for predicting the result of twenty over match format. The study was done on English Cricket Cup and also the model was tested on seasons between 2009 to 2014, supported the information from previous matches. A rule was designed on easy prediction and so any reports were administrated on features for in-depth analysis. foremost the team information was used and so player information was analyzed. choice ways used were Chi-square testing, mutual data and Pearson correlation. They used Naive Thomas Bayes, logistical Regression, Random Forests and Gradient call Trees on the chosen options from the information. By victimization these ways they foreseen the match outcome, it absolutely was found that the rule derived by Naïve Thomas Bayes offered around sixty fourth prediction accuracy on the dataset used. At a similar time comparing the accuracy of various techniques, Na €I ve Thomas Bayes made the very best level of accuracy, very cheap was Gradient call Trees.

Munir et al. (2015) experimented with twenty20 format to predict the result using data mining techniques. The main aim of this study is to the combine pre-game and in-game data for prediction. They considered the T 20 International match data along with IPL data until 2015 season for dataset. In depth analysis was conducted by putting the data on the basis of venue, one

team head-to-head results of teams, batting first and so on. Decision Tree was made to predict the match result, and it produced models with almost 78% accuracy for the team that bats first and 75% when it bats second. IG technique was used for feature selection.

2. METHODOLOGY

The work of our project focuses on 2 models.

2.1 Descriptive model

The descriptive model focuses principally on 2 aspects: It describes the information and statistics of the previous information concerning the batsmen, bowler or the all rounder. It provides the past data of the matches via by the groups.

2.2 Prognosticative model

The prognosticative model focuses on predicting the winning proportion of the team. The ranking of the players on the idea of points are displayed further. The user should select the 2 groups playing against one another. the choice of the teams works on the factors as:

- (i) If the players area unit batsmen, then, sorting is finished according to the strike rate of the batsmen.
- (ii) If the players area unit bowlers, then, sorting is finished according to the typical rate of the bowler.
- (iii) If the players area unit all rounder then, sorting is finished considering each strike rate further as average rate.

The rule utilized in this model is call Tree Classifier. a choice tree is made victimization top-down approach. during this rule the foundation node i.e., the prior issue thought-about is that the is that the match is being vie. The tree is made in step with the prominent factors (city, venue, teams, toss decision)considered within the match.

DECISION CLASSIFIER DIAGRAM:

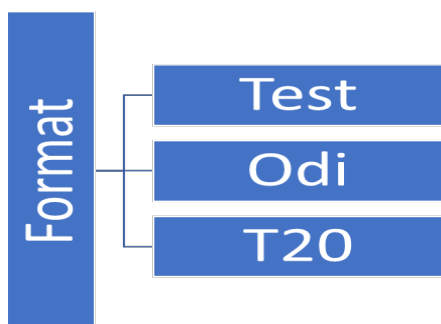


FIG 2.1 SELECTING FORMAT

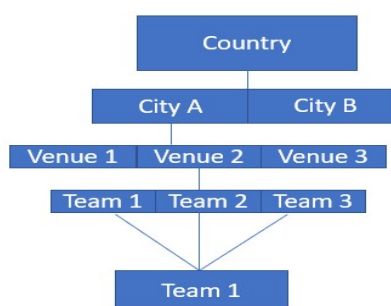


FIG 2.2 SELECTING CONDITIONS

Algorithm is as follows

- ▶ Start Select the format rest the algorithm goes same for everyone
- ▶ Select the node 'country'
- ▶ Choose from one of the cities from the option
- ▶ Select the venue of the match
- ▶ The teams are selected and compared with each other'
- ▶ End

3. RESULT

At the top the prediction is created in accordance with the descriptive approach and result given on the idea of a specific player and team's performance in numerous cities venues with the

result of toss because it tells that team can bat and bowl 1st. the user able to access the 2 models that's Descriptive model that shows the statistics of the player and also the prognosticative model that predicts the winning proportion of the team that the user has chosen.

4. CONCLUSIONS

This model will definitely assist the coaches and teams to select their squad as per the format and tournament. Not only helping the national teams but also for the domestic cricket and the famous leagues such as IPL, BBL and CPL etc. as it helps the stack holders so that they effectively choose their teams in auctions and bid on the players determining their capabilities and approach on the different venues under different conditions.

The most interesting part in this model has other aspects also that helps the normal public to make their teams to the platforms like dream11, game zy and my cricket circle etc. Similarly, it can help the bookies to determine their winning chances and helps them to invest their money but this is particularly not a good idea. This model is not intentionally made for this.

While identifying this model on the previous matches it is found that 60% of the teams supports this model and it is effectively working for the future matches also

5. FUTURE DIRECTION

In future the focus will be on adding the other concept that is sentiment analysis which will help in understanding what the public and experts wants to see. This will help further in understanding which team is best suited. This will cover the drawback of this model that is will help analyzing new players as there is no historical data available for them as they have no experience internationally or for the following format.

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IMPACT OF MENTAL RELAXATION TRAINING ON SELECTED NEURO-PSYCHO-PHYSIOLOGICAL VARIABLES OF BOXERS

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ABSTRACT

The study was conducted to find out the Impact of Mental Relaxation Training on selected neuro-psycho-physiological variables of boxers. For this study 60 male boxers', aged of 16 to 22 years were selected randomly as subjects from KD's Boxing Academy of Mumbai. The selected 60 boxers were divided into two equal groups viz: experimental group and control group consisting of thirty subjects in each group. The experimental group was given Mental Relaxation Training for 32 weeks, three days in a week for a duration of one hour in the evening. The control group was treated as sedentary. The data were collected by conducting the pre and post-test of both the groups on the selected neuro-psycho-physiological variables i.e. Hand reaction time, Foot reaction time, Static balance, Stress, Anxiety, concentration, Pulse rate and Blood pressure of the Boxers. The collected data were analysed by using the 'ANCOVA' test for significance difference. While concluding, it may be stated that mental relaxation training exercises significantly showed reduction in the Hand reaction time, Foot reaction time, Anxiety, Stress, and improvement in Concentration, Static balance as well as significantly helped to maintain Pulse rate and Blood pressure of the Boxers.

Key Words:- Mental Relaxation training, reaction time, balance, stress, anxiety, concentration, Pulse Rate, BP

INTRODUCTION

Researchers have reported that 50 percent of consultations among athletes at Olympic games or sports events were related to stress or anxiety problems (Murphy, 1988).

Coaches as well as Sports psychologists have strongly believed that negative psychological pressure such as Anxiety and stress lead neuro-muscular as well as physiological bad impact during competitions are harmful, worsening performance and even leading to dropouts (Hanin, 2000). Anxiety, as a negative emotion, affects perceptions in sport competitions, where a large majority of athletes consider anxiety to be debilitating towards performance, which may result in decreases in performance (Weinberg & Gould, 2011; Raglin & Hanin, 2000). Contradictory, the somatic is the physiological element, which related to autonomic arousals, negative symptoms such as feelings of nervous, high blood pressure, dry throat, muscular tension, rapid heart rate, sweaty palms and butterflies in your stomach (Jarvis, 2002; Jones, 2000; Martens, Vealey & Burton, 1990). The application of mental Relaxation skills in sports is linked with the development and maintenance of expert performance in sport (Durand-Bush and Salmela, 2002; Orlick, 2000). Research identifies a number of psychological variables that are linked with enhanced performance in combat sports. These variables comprise of psychological skills including: concentration (Williams and Elliott, 1999). A significant amount of research has been conducted on competitive anxiety on sports (Martens, Vealey & Burton, 1990) and the relaxation techniques (Humara, 2001; Martens, Vealey & Burton, 1990; Richards, 2004). Many researches indicated that relaxation techniques benefits athletes by enhancing self-confidence, concentration, performance, reducing anxiety and stress, blood pressure besides muscle tense (Pragman, 1998; Vincent & Yahaya, 2012; Weinberg & Gould, 2011). Research has indicated that most successful athletes used relaxation techniques compared to less successful athletes (Gould, Eklund & Jackson, 1993; Orlick & Partington, 1988).

Boxing is one of the most popular combat sports. It's a combination of strength, power, agility, stamina and endurance. In this competitive world everyone wants to become a champion. Players do regular training for that but they concentrate more on their physical abilities. Players tend to give less importance to psychological abilities. This aspect is equally important. As a result boxers suffer from problems like Anxiety, Stress, Fatigue and multiple nerve-related difficulties as well as lack confidence related to their performance in the boxing ring. Doubts regarding their performance in the ring, level of preparation and fitness bring about fluctuations in Blood Pressure, Pulse rate, and Breathing which ultimately effect on their performance. Therefore proper study of these vital variables of Boxers is very important and finding proper solutions is "the need of the hour". Mental relaxation techniques may improve the mental strength of the Boxers and ultimately their performance.

It was hypothesized that the mental relaxation training may help to reduce Hand reaction time, Foot reaction time, static balance, Anxiety, Stress, Concentration Blood pressure (Diastolic and Systolic), and normal Pulse rate of boxers.

2. METHODOLOGY

2.1 Sample

Sixty male Boxers from KD's Boxing Academy, Mumbai between the ages of 16 to 22 years were selected randomly as subjects for this study to find out the Impact of Mental Relaxation Training on selected neuro-psycho-physiological variables of boxers.

2.2. Selection of Variables

The following were the selected dependent variables (neuro-psycho-physiological) of the study

Neurological Variables	Psychological Variables	Physiological Variables
1. Hand reaction time 2. Foot reaction time 3. Static balance	4. Anxiety 5. Stress 6. Concentration	7. Pulse rate 8. Systolic Blood pressure 9. Diastolic blood pressure

2.3 Selection of Tools:

The following tools were use in this study

No.	Dependent Variables	Test	Equipment	Unit of Measure
Neuro-Muscular Variable				
1	Hand reaction time	Nelson Hand Reaction Time	Scale, paper, pen and Table	Centimetre
2	Foot reaction time	Nelson Foot Reaction Time	Scale, paper, pen, Table and wall	Centimetre
3	Static Balance	Stork stand test	Stopwatch, paper, pen	Second
Psychological Variable				
4	Anxiety	Sport competition anxiety test	Questionnaire, paper and pen	Number
5	Stress	Comprehensive Stress questionnaire		Number
6	Concentration	Concentration questionnaire		Number
Physiological Variable				
7	Pulse rate	Dr. Morepen BP monitor	Dr. Morepen BP monitor, paper and pen	Beat per min
8	Diastolic and systolic Blood pressure			mm Hg

2.4 Research Design

Parallel group experimental design was formulated for this experimental study. The subjects were divided into two equal groups viz: experimental group and control group consisting of 30 subjects in each group. The experimental group was given Mental Relaxation Training for 32 weeks, three days in a week for duration of one hour in the evening. The control group has not received Mental Relaxation Training. The pre post tests were conducted on the selected neuro-psycho-physiological variables administering standardized tests.

2.5 Data Collection

The data were collected by conducting the pre and post-test of both the groups on the Anxiety, Stress, concentration, pulse rate and blood pressure variables administering standardised test of the Boxers.

2.6 Statistical Techniques

The data was analysed by using 'ANCOVA' test.

3. FINDINGS OF STUDY

The data collected on pre and post-test on neuro-psycho-physiological variables analysed and the data were arranged systematically in tabular forms associated with graphical representations and were interpreted logically considering the scientific values.

TABLE 1
LEVENE'S TEST OF EQUALITY OF ERROR VARIANCE IN REACTION TIME, STATIC BALANCE, ANXIETY, STRESS, CONCENTRATION, PULSE RATE AND BLOOD PRESSURE AMONG EXPERIMENTAL AND CONTROL GROUP

No.	Variables	F	Df1	df2	Sig.
1	Hand reaction time	.435	1	58	.512
2	Foot reaction time	1.205	1	58	.277
3	Static Balance	1.294	1	58	.260
4	Anxiety	5.924	1	58	.018
5	Stress	5.847	1	58	.019
6	Concentration	3.984	1	58	.051
7	Pulse rate	1.930	1	58	.170
8	Diastolic BP	.230	1	58	.633
9	Systolic BP	1.590	1	58	.212

* The obtained significance value was greater than 0.05.

It was concluded from table 1 that there is equal error variance among groups and performing of ANCOVA is optimally valid.

TABLE 2
ANALYSIS OF COVARIANCE OF AMONG REACTION TIME, STATIC BALANCE, ANXIETY, STRESS, CONCENTRATION, PULSE RATE AND BLOOD PRESSURE OF GROUPS

Variables	Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Hand reaction time	Pre_HRT	87.082	1	87.082	32.767	.000
	Groups	522.437	1	522.437	196.581	.000
	Error	151.484	57	2.658		
	Corrected Total	714.583	59			
Foot reaction time	Pre_FRT	259.439	1	259.439	72.139	.000
	Groups	639.399	1	639.399	177.789	.000
	Error	204.994	57	3.596		
	Corrected Total	1034.850	59			
Static Balance	Pre_SB	74.459	1	74.459	28.779	.000
	Groups	622.066	1	622.066	240.434	.000
	Error	147.474	57	2.587		
	Corrected Total	836.333	59			
Anxiety	Pre-Anxiety	29.445	1	29.445	17.449	.000
	Groups	305.810	1	305.810	181.220	.000
	Error	96.188	57	1.688		
	Corrected Total	402.983	59			

Variables	Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Stress	Pre-Stress	244.271	1	244.271	20.367	.000
	Groups	4327.999	1	4327.999	360.862	.000
	Error	683.629	57	11.993		
	Corrected Total	5011.650	59			
Concentration	Pre_Concentration	39.168	1	39.168	25.496	.000
	Groups	300.581	1	300.581	195.661	.000
	Error	87.565	57	1.536		
	Corrected Total	391.333	59			
Pulse Rate	Pre-Pulse	468.627	1	468.627	63.247	.000
	Groups	502.564	1	502.564	67.827	.000
	Error	422.340	57	7.409		
	Corrected Total	1366.983	59			
Diastolic blood pressure	Pre_diastolic	.756	1	.756	.075	.785
	Groups	303.753	1	303.753	30.237	.000
	Error	572.610	57	10.046		
	Corrected Total	886.183	59			
Systolic pressure	Pre_systolic	.796	1	.796	.059	.809
	Groups	522.939	1	522.939	38.729	.000
	Error	769.637	57	13.502		
	Corrected Total	1292.583	59			

It is evident from table 2 that after 32 weeks of mental relaxation training was significant as the obtained p-value is less than 0.05.

TABLE 3

ADJUSTED MEAN AND STANDARD ERROR OF HAND REACTION TIME OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	16.533	9.940	.299	9.341	10.539
Control Group	15.667	15.893	.299	15.295	16.492

Table 3 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 16.533 - post mean score is 9.940 and control group per mean score is 15.667 – post mean score is 15.89. It was hypothesized that Mental Relaxation training Program has significant demotion in Hand Reaction time of Boxers” is accepted.

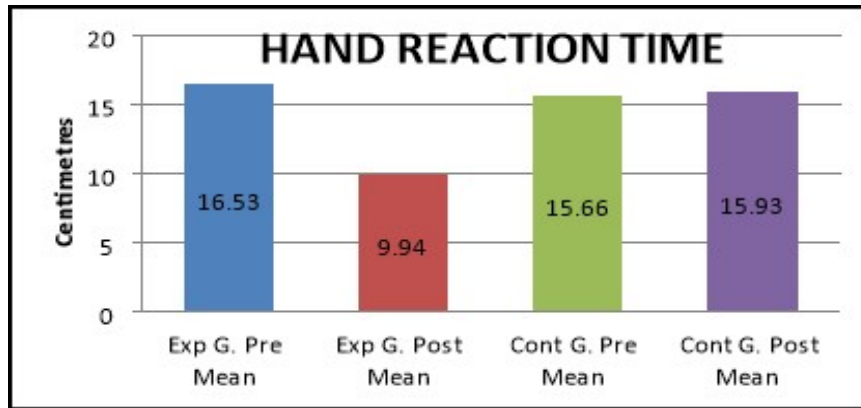


FIGURE-1: MEAN PLOT OF ADJUSTED MEANS OF HAND REACTION TIME OF EXPERIMENTAL AND CONTROL GROUP

TABLE 4
ADJUSTED MEAN AND STANDARD ERROR OF FOOT REACTION TIME OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	19.433	12.771	.347	12.076	13.466
Control Group	18.866	19.329	.347	18.634	20.024

Table 4 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 19.433 – post mean score is 12.771 and control group is pre mean score is 18.866 – post mean score is 19.329. It was also hypothesized that Mental Relaxation training Program has significant demotion in Foot Reaction time of Boxers” is accepted.

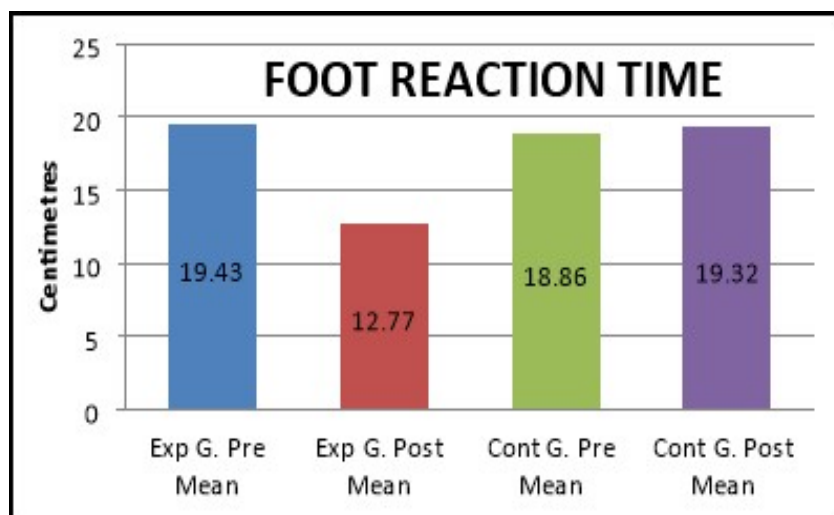


FIGURE:2 MEAN PLOT OF ADJUSTED MEANS OF FOOT REACTION TIME OF EXPERIMENTAL AND CONTROL GROUP

TABLE 5
ADJUSTED MEAN AND STANDARD ERROR OF STATIC BALANCE OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	6.966	13.387	.294	12.799	13.975
Control Group	7.033	6.946	.294	6.358	7.534

Table 5 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 6.966 – post mean score is 13.387 and control group is pre mean score is 7.033 - post mean score is 6.946. It was also hypothesized that Mental Relaxation training Program has significant improvement in Static Balance of Boxers” is accepted.

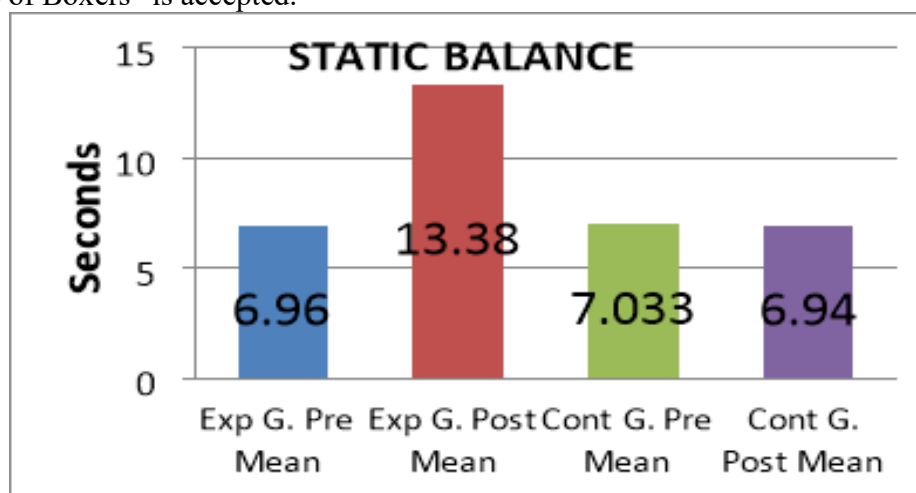


FIGURE 3-MEAN PLOT OF ADJUSTED MEANS OF STATIC BALANCE TIME (SST) OF EXPERIMENTAL AND CONTROL GROUP

TABLE 6
ADJUSTED MEAN AND STANDARD ERROR OF ANXIETY OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	23.933	18.348	.241	17.865	18.831
Control Group	22.966	23.018	.241	22.535	23.502

Table 6 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 23.933 – post mean score is 18.348 and control group pre mean score is 22.966 - post mean score is 23.018. It was also hypothesized that Mental Relaxation training Program has significant demotion in Anxiety of Boxers” is accepted.

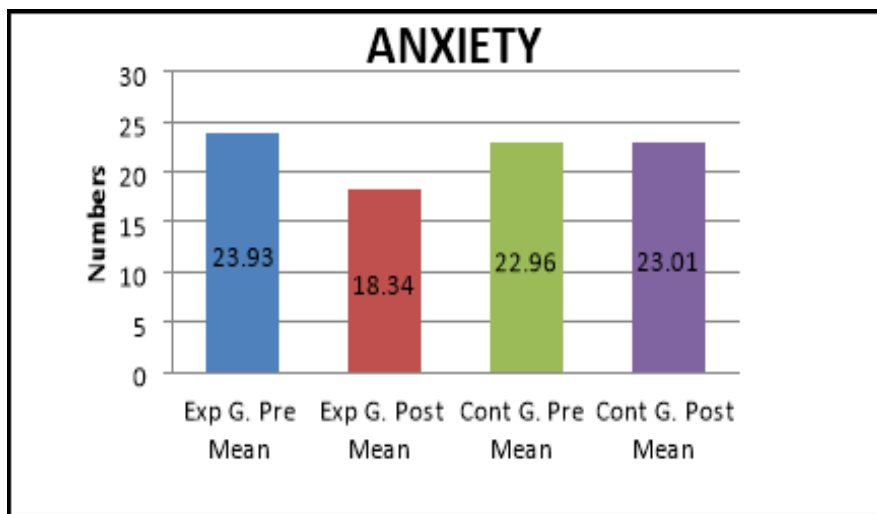


FIGURE: 4-MEAN PLOT OF ADJUSTED MEANS OF ANXIETY (SCAT) OF EXPERIMENTAL AND CONTROL GROUP

TABLE 7
ADJUSTED MEAN AND STANDARD ERROR OF STRESS OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	67.833	48.602	.642	47.316	49.887
Control Group	65.466	66.098	.642	64.813	67.384

Table 7 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 67.833 – post mean score is 48.602 and control group pre mean score is 65.466 – post mean score is 66.098. It was also hypothesized that Mental Relaxation training Program has significant demotion in stress of Boxers, is accepted.

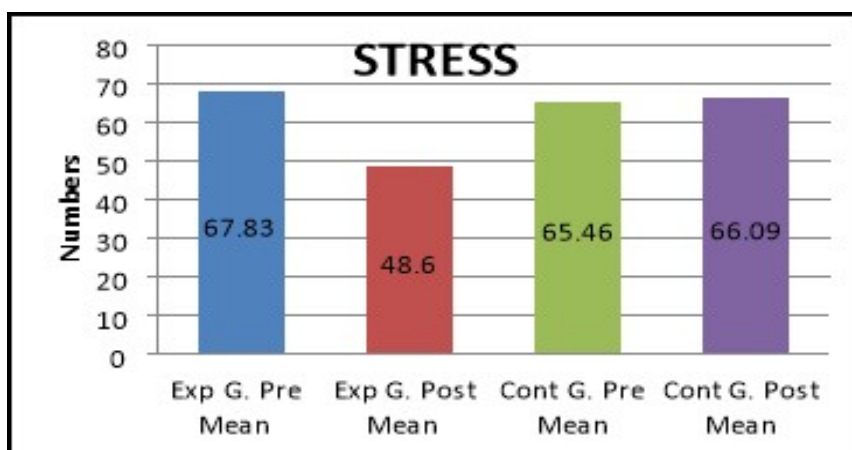


FIGURE:5-MEAN PLOT OF ADJUSTED MEANS OF STRESS (CSQ) OF EXPERIMENTAL AND CONTROL GROUP

TABLE 8
ADJUSTED MEAN AND STANDARD ERROR OF CONCENTRATION OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	14.6	9.348	.230	8.886	9.809
Control Group	13.666	13.986	.230	13.524	14.447

Table 8 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 14.6 – post mean score 9.348 and control group pre mean score is 13.666 – post mean score is 13.986. It was also hypothesized that Mental Relaxation training Program has significant improvement in concentration of Boxers, is accepted.

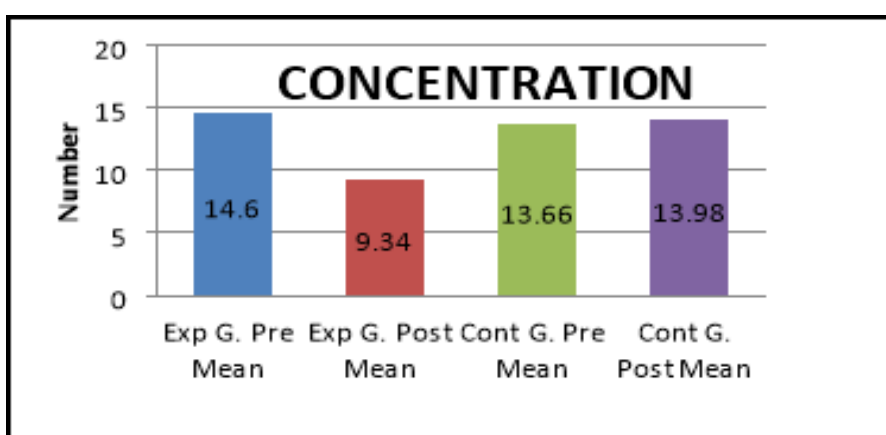


FIGURE: 7-MEAN PLOT OF ADJUSTED MEANS OF CONCENTRATION (CQ) OF EXPERIMENTAL AND CONTROL GROUP

TABLE 9
ADJUSTED MEAN AND STANDARD ERROR IN PULSE RATE OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean		Post Mean		Std. Error	95% Confidence Interval	
	BTON	ATON	BTON	ATON		Lower Bound	Upper Bound
Experimental Group	72.57	79.3	71.4	73.421	.497	72.426	74.417
Control Group	73.03	78.93	73.2	79.212	.497	78.217	80.207

Table 9 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is BTON 72.57 / ATON 79.3 - post mean score is BTON 71.4 / ATON 73.421 and control group pre mean score is BTON 73.03 / ATON 78.93 – post mean score is BTON 73.2 / ATON 79.212. It was also hypothesized that Mental Relaxation training Program has significant to maintain normal pulse rate of Boxers, is accepted.

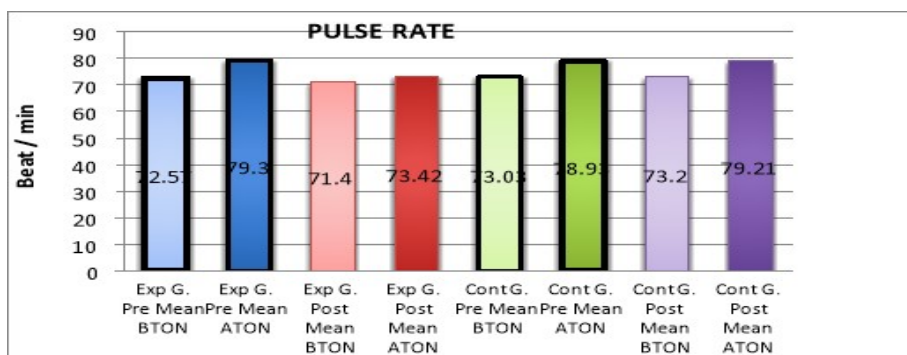


FIGURE 8-MEAN PLOT OF ADJUSTED MEANS OF PULSE RATE OF EXPERIMENTAL AND CONTROL GROUP

TABLE 10
ADJUSTED MEAN AND STANDARD ERROR OF DIASTOLIC BLOOD PRESSURE OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean		Post Mean		Std. Error	95% Confidence Interval	
	BTON	ATON	BTON	ATON		Lower Bound	Upper Bound
Experimental Group	78.3	67.3	78	74.052	.581	72.889	75.216
Control Group	78.8	69.77	77.8	69.515	.581	68.351	70.678

Table 10 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is BTON 78.3 / ATON 67.3 – post mean score is BTON 78 / ATON 74.052 and control group pre mean score is BTON 78.8 / ATON 69.77 – post mean score is BTON 77.8 / ATON 69.515. It was also hypothesized that Mental Relaxation training Program will have significant to maintain normal Diastolic B.P (Blood pressure) of Boxers, is accepted.

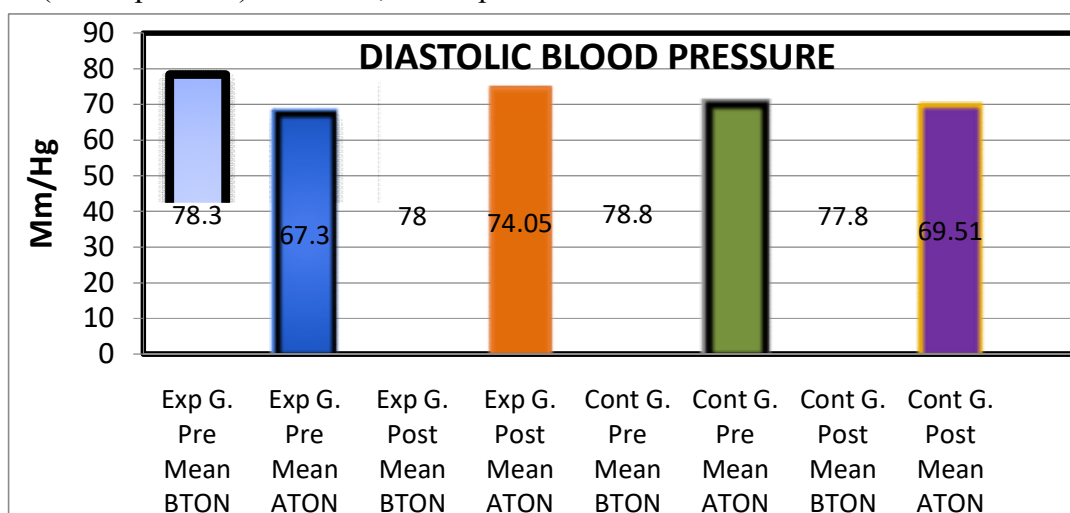


FIGURE 8-MEAN PLOT OF ADJUSTED MEANS OF DIASTOLIC BLOOD PRESSURE OF EXPERIMENTAL AND CONTROL GROUP

TABLE 11
ADJUSTED MEAN AND STANDARD ERROR OF SYSTOLIC BLOOD PRESSURE OF
EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean		Post Mean		Std. Error	95% Confidence Interval	
	BTON	ATON	BTON	ATON		Lower Bound	Upper Bound
Experimental Group	126.26	133.5	126	127.129	.671	125.785	128.473
Control Group	127.6	133	128	133.037	.671	131.694	134.381

Table. 11 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is BTON 126.26 / ATON 133.5 – post mean score is BTON 126 / ATON 127.129 and control group pre mean score is BTON 127.6 / ATON 133 – post mean score is BTON 128 / ATON 133.037. It was also hypothesized that Mental Relaxation training Program will have significant to maintain normal Systolic B.P (Blood pressure) of Boxers., is accepted.

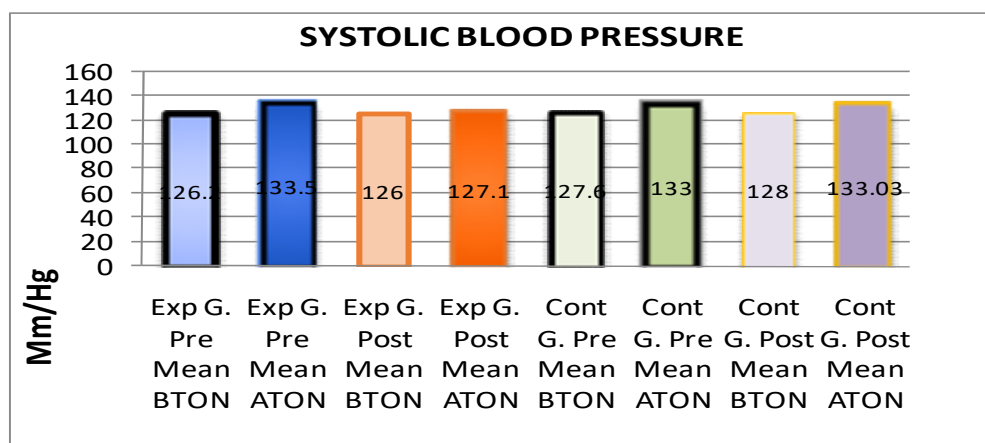


FIGURE 8-MEAN PLOT OF ADJUSTED MEANS OF SYSTOLIC BLOOD PRESSURE OF EXPERIMENTAL AND CONTROL GROUP

4. DISCUSSIONS

From the above findings of the present study, selected mental relaxation training exercises contributed positively towards the improvement of selected neuro-psycho and physiological variables of the Boxers.

5. CONCLUSIONS

1. Mental Relaxation training Program has showed significant demotion in Hand Reaction, Foot Reaction time, Anxiety and Stress
2. Mental Relaxation training Program has showed significant improvement in Static balance and Concentration of Boxers.
3. Mental Relaxation training Program has showed significant to maintain normal pulse rate and Blood pressure of Boxers.

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EFFECTIVENESS OF SIX WEEKS MENTAL IMAGERY INTERVENTION ON CONVENTIONAL "V" GRIP USED BY BATSMAN

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ABSTRACT

The grip is one of the basic batting skills in cricket. It is referred to how a batsman holds the bat. It is the most essential part of batting skills because a comfortable and correct grip gives a batsman chance to execute a range of shots with flair. So the present study aimed to evaluate the efficacy of six weeks mental imagery intervention on batting skills namely conventional V grip among U-19 male cricket players. To conduct the study 50 male cricket players enrolled in various cricket academies in Bilaspur were selected as sample. The age range of the subjects was 17 to 19 years. The other criterion for selection was participation as a specialist batsman in a district level tournament. The convenience sampling method was used for the selection of subject. The grip used by the batsman was assessed by the batting coach. A six weeks mental imagery intervention program prepared by the researcher in consultation with a research supervisor and experts in the field of sports psychology was used in this study. The mental imagery intervention program was based on PETTLEP model suggested by Holmes & Collins (2001). It includes P as physical, E as Environment, T as Task, T as Timing, L as Learning, E as Emotions and P as perspective respectively. The mental imagery program was of 60 minutes duration and of 05 days a week. The data on the correctness of grip used by a batsman was collected thrice i.e. before the start of mental imagery intervention, after three weeks from the start of the program and after six weeks after commencement of the intervention program. A significant increase in technique to hold to bat was observed during six weeks mental imagery intervention. It was concluded that mental imagery is a useful technique to improve the technique of a batsman to hold the bat i.e. grip on the bat.

Keywords : Mental imager, Conventional "V" grip, batsman

1. INTRODUCTION

The grip is one of the basic and essential skills for a batsman to excel. The grip on a bat is important as it helps a batsman to hit a delivery with timing and precision. How a batsman holds the bat is referred to as grip. To become a good batsman, the grip is one of the factors that is essential. To play a wide range of shots, a comfortable and correct grip is required. There are two types of grips used by a batsman - 1. "V" shaped and 2. "O" shaped grip respectively. The "V" shaped grip is more commonly used. In a V-shaped grip both the hands are close to each other. The left hand is at the top for the right-hander with the bottom hand holding the bat a little bit loose. The back of the palm in this grip is facing towards the wicketkeeper. In this way, both the palms make V shape and the centre line runs through the back of the bat. The V-shaped grip is used by the majority of the batsman. Another aspect of grip on the handle of the bat is the positioning of hands. If too much space is left above the left hand, it creates problems in executing certain shots or maybe the cause of wrist injury in a longer period. The major benefit of this grip is that the batsman can play shots all around the park with ease. So a solid technique is built on sound grip on the bat handle. Keeping the importance of grip on bat handle on batsman's performance various techniques are used to correct the flaws in it. One such technique that can be used to improve correctly using "V" shaped grip may be the mental imagery technique. **Morris, Spittle and Watt (2005)** defined mental imagery as one's capability to form controllable images and retaining them for sufficient time to achieve the required imagery rehearsal. In this regard sportsperson with better imagery ability benefit more from visualisation technique as compared to those with poorer imagery ability. A study conducted by **Robin et al. (2007)** also reported that following imagery intervention tennis serve return accuracy of players with better imagery ability improved more significantly as compared to players with inferior imagery ability. Like any other sport such as golf, soccer, basketball etc. role of mental skills in the sports performance of cricket players has been scientifically documented. It is believed that elite cricketers often use visualization technique or mental image to rehearse the plan or technique that is to be executed during an actual match situation. In this way, a bowler visualizes bowling a yorker or bouncer or a slower ball. Similarly, batting also starts in the mind. Batsman visualizes a cover drive or a defensive shot in their mind as if they are executing it in a match. Stance, the grip of the bat, back lift, initiation, downswing and follow-through are an integral part of batting skills (**Stretch, Bartlett, & Davids, 2000**) In this way they prepare themselves for actual match situation. Hence visualization is an integral part of cricket mental training. The role of mental skills in terms of visualization has also been advocated by eminent players like Sachin Tendulkar after the World Cup triumph. As far as literature on mental imagery and sports performance, researchers such as **Roure et al. (1998)**, **TheIwell and Maynard (2003)**, **Seif-Barghi et al. (2012)**, **Dana and Gozalzadeh (2017)** have documented the benefits of mental imagery training on sports performance. Hence the researcher decided to assess the efficacy of six weeks mental imagery intervention on conventional "V" grip of batsman playing in a U-19 cricket tournament.

The objective of the present study is to assess the impact of six weeks mental imagery program on the conventional "V" grip used by the batsman. It was also hypothesized that the six weeks mental imagery intervention for batsman will significantly improve their technique to grip on bat handle in the form of conventional V grip.

2. METHODOLOGY

The following methodological steps were taken to conduct the present study.

2.1 Sample

To conduct the study 50 male cricket players enrolled in various cricket academies in Bilaspur were selected as sample. The age range of the subjects was 17 to 19 years. The other criterion for selection was participation as a specialist batsman in a district level tournament. The convenience sampling method will be used for the selection of subject.

2.2 Tools

Mental Imagery Intervention: Six weeks mental imagery intervention program was prepared by the researcher in consultation with the research supervisor and experts in the field of sports psychology. The mental imagery intervention program was conducted based on PETTLEP model suggested by **Holmes & Collins (2001)**. It includes P as physical, E as Environment, T as Task, T as Timing, L as Learning, E as Emotions and P as perspective respectively. The mental imagery program was of 60 minutes duration and of 05 days a week. Participant was asked to come in full gear for imagery session with their pads, helmet and gloves on and bat in hands (physical and environment). Participants were asked to imagine the bat swing exactly as it naturally occurs in offensive or defensive technique (task). They were asked to write down the comfortable grip on the bat handle. The participants were instructed to image their bat swing and ball trajectory using the correct conventional V grip.

The grip on bat handle and wrist position: The correctness of grip on bat handle and wrist position is assessed by a batting coach of the academy. The coach assigns the marks on a scale ranging from 1 to 8 for ideal grip on bat handle.

2.3 Procedure

First of all, 50 district level U-19 male cricket players playing as a specialist batsman were identified through the convenience sampling method. The selected batsman were subjected to mental imagery intervention while continuing their routine physical and skill-related sessions. The correctness of the conventional "V" grip of selected male cricket players was assessed and rated on a scale of 1-8 points by the batting coach before the commencement of the study period. The selected subjects then took part in six weeks mental imagery intervention program. The correctness of conventional "V" grip of selected male cricket players (batsman) was again reassessed after 03 weeks and 06 weeks respectively. Repeated measures ANOVA was used for data analysis and the results are shown in table 1, and 2.

3. RESULTS

TABLE 1
DESCRIPTIVE STATISTICS OF MENTAL IMAGERY INTERVENTION PROGERAM
FOR CORRECTNESS OF CONVENTIONAL "V" GRIP
OF MALE BATSMAN IN CRICKET

Conditions	N	Conventional "V" Grip	
		Mean	S.D.
Before Study Period	50	3.92	1.45
After 03 Weeks	50	4.18	1.78
After 06 Weeks	50	5.38	1.61

Table 1 indicates the mean rating on the conventional "V" grip used by the batsman. Before the commencement of the study, the mean rating score was 3.92. After 03 weeks interval, the mean judges rating on the conventional "V" grip used by the batsman was 4.18 and after 06 weeks it was 5.38. The F ratio of 19.46 was found to be statistically significant at .01 level.

TABLE 1(a)
REPEATED MEASURES ANOVA ON IMAGERY OF BATAMAN OF CRICKET IN THEIR PRE-TEST AND POST-TEST AFTER 03 WEEKS AND 06 WEEKS

Source	df	Sum of Squares	Mean Square	F	Sig.
Before Study Period	1.71	60.653	33.305	19.16	.01
After 03 Weeks	83.96	152.68	1.818		

The obtained results are shown in table 1 and 1(a) were also confirmed by Least Significant Difference Test presented in table no. 2.

TABLE 2
LEAST SIGNIFICANT DIFFERENCE TEST BETWEEN ORDERED PAIRED MEANS ON IMAGERY INTERVENTION PROGRAM OF BATSMAN IN THEIR PRE-TEST AND POST-TEST AFTER 03 WEEKS AND 06 WEEKS TRAINING OF V-GRIP IN CRICKET

Before Study Period	After 03 Weeks	After 06 Weeks	MD
3.92	4.18		0.26
3.92	-	5.38	1.46*
-	4.18	5.38	1.20*

* Significant at .05 level

Statistical figures presented in table 2 draws the following inferences:

1. The technique to hold the bat with conventional "V" grip was found to be enhanced in a group of batsman after three weeks of mental imagery intervention (M=4.18) as compared to the start of the program (M=3.92) but the mean difference of 0.26 was statistically non-significant.
- 2.. The technique to hold the bat with conventional "V" grip was found to be enhanced after six weeks of mental imagery intervention (M=5.38) as compared to the start of the program (M=3.92) with a mean difference of 1.460 being statistically significant at .05 level.
3. The technique to hold the bat with a conventional "V" grip was found to be enhanced after six weeks of mental imagery intervention (M=5.38) as compared to what it was after three weeks of mental imagery intervention program (M=4.18) with a mean difference of 1.20 being statistically significant at .05 level.

4. DISCUSSION

Results of the present study revealed a significant impact of six weeks mental imagery intervention on conventional "V" grip and wrist position on the bat handle. **Morris, Spittle and Watt (2005)** defined mental imagery as one's capability to form controllable images and retaining them for sufficient time to achieve the required imagery rehearsal. In this regard sportsperson with better imagery ability benefit more from visualisation technique as compared to those with poorer imagery ability. **TheIwell and Maynard (2003)** assessed the effect of mental skills program on a repeatable good performance in cricketers. They advocated that in this multidimensional conceptualization of sports performance, psychological or mental skills become a common essential factor for sports excellence. The results are also consistent PETTLEP model suggested by **Holmes & Collins (2001)**.

5. CONCLUSION

Based on results, it may be concluded that batsman may correct flaws in their conventional "V" grip and wrist position with proper use of mental imagery intervention even of short duration. Hence the efficacy of mental imagery training program for enhancing the grip and wrist position of the batsman is supported in this study.

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**IMPORTANCE OF SPORTS IN BOOSTING ASSERTIVENESS: A
STUDY ON SECONDARY SCHOOLS STUDENTS OF
CHANDWAD TEHSIL**

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ABSTRACT

Physical education plays important role in school education. Physical and psychological aspects of children are considerable according to their development. In the present study, researcher has tried to examine the effect of physical education on children's mental health, their personality trait like assertiveness etc according to their participation in sport activities and aloof from them with their gender. Various past researches indicates this type of trend, but as a game teacher, researcher, want to confirm these findings, he chose this subject. For this purpose he used 2X2 factorial design. 600 school students are selected randomly from secondary schools of Chandwad Taluka, Nashik district. Results revealed that physical education has impact on mental health and assertiveness of students. As well as it is found that there is a positive relationship between physical education training and mental health and physical education training and assertiveness of the students. Gender difference has been found in mental health but not in assertiveness.

Keywords: Physical and Psychological aspects, Mental Health & Personality Trait.

1. INTRODUCTION

Sport, Games and exercise are useful for our health. Sound mind and sound body is a result of games and playing. In an interdisciplinary science called sport psychology is a combination of kinesiology and psychology. In this science it is studied that how various sport activities are helpful for improve one's performance in various angles. In addition to instruction and training of psychological skills for performance improvement, applied sport psychology may include work with athletes, coaches, and parents regarding injury, rehabilitation, communication, team building, and career transitions. The birth of sports psychology in Europe happened largely in Germany. The first sports psychology laboratory was founded by Dr. Carl Diem in Berlin, in the early 1920s, (Cole, B., 2012). Games like Football, Wrestling and Basketball, Golf are beneficial for children learn to work together and use appropriate social skills. Co-operative hoops are the useful for understand the concept of inclusion and that everyone belongs no matter the situation. Some games like Kabaddi, Kho-Kho are helpful to develop cooperation skills. Well-designed sequences of challenging physical activity can lay important foundations for physical health and well-being. Physical activity also contributes to psycho- social development. Or physical activities can simply be used for fun. The new and recent trend is related to sedentary games. Like VDO games, the concerned about the effects of video games on your health? Or perhaps you're just curious about this stuff or need to research it for a study.

Sport has many aspects. Psychological aspect of the player is very important for good performance and it is a matter of research study. A new branch, Sport psychology is an interdisciplinary science that draws on knowledge from the fields of Kinesiology and psychology. It involves the study of how psychological factors affect performance and how participation in sport and exercise affect psychological and physical factors. In addition to instruction and training of psychological skills for performance improvement, applied sport psychology may include work with athletes, coaches, and parents regarding injury, rehabilitation, communication, team building, and career transitions.

We know that exercise has positive effects on the brain. Researchers at Duke University demonstrated several years ago that exercise has antidepressant properties. Other research has shown that exercise can improve the brain functioning of the elderly and may even protect against dementia.

One theory for some of the benefits of exercise include the fact that exercise triggers the production of endorphins. These natural opiates are chemically similar to morphine. They may be produced as natural pain relievers in response to the shock that the body receives during exercise. However, researchers are beginning to question whether endorphins improve mood. Studies are showing that the body's metabolism of endorphins is complex, and there are likely additional mechanisms involved in the mental health effects of exercise.

Some studies have found that exercise boosts activity in the brain's frontal lobes and the hippocampus. We don't really know how or why this occurs. Animal studies have found that exercise increases levels of serotonin, dopamine and norepinephrine. These neurotransmitters have been associated with elevated mood, and it is thought that antidepressant medications also work by boosting these chemicals.

Exercise has also been found to increase levels of "brain-derived neurotrophic factor" (BDNF). This substance is thought to improve mood, and it may play a role in the beneficial effects of exercise. BDNF's primary role seems to be to help brain cells survive longer, so this may also explain some of the beneficial effects of exercise on dementia.

Applied sport and exercise psychology consists of instructing athletes, coaches, teams, exercisers, parents, fitness professionals, groups, and other performers on the psychological aspects of their sport or activity. The goal of applied practice is to optimize performance and enjoyment through the use of psychological skills.

It is pertinent to mention that the practice of applied sport psychology is not legally restricted to individuals who possess one type of certification or licensure. The subject of "what exactly constitutes applied sport psychology and who can practice it?" has been debated amongst sport psychology professionals, and as of 2011, still lacks formal legal resolution in the United States. For instance, some question the ability of professionals who possess only sport science or kinesiology training to practice "psychology" with clients, while others counter that clinical and counseling psychologists without training in sport science do not have the professional competency to work with athletes. The bottom line that most of us feel good after exercise. Physical exercise is good for our mental health and for our brains. Someday we will understand it all better - but we can start exercising today.

2. METHODOLOGY

In this chapter, the overall design of the study, the research questions, the population and sample selection of the study, the data collection instruments, the data collection procedure, and the data analysis methods are presented.

Here, researcher mention complete methodology of the research work such as objectives, hypotheses, research design, sample of the study, details about tools and data collection, the scoring and the data analysis. According to the need of present research researcher has implied here survey research technique. Survey research is a new technique for social science research. Survey, as such, is quite an old technique and was largely developed in the eighteenth century. However, in the second part of the nineteenth century a systematic literature was made available by Booth who is regarded as the father of scientific social surveys (Moser & Kalton, 1971). But survey research as a special branch of social science research, is considered as a new technique developed in the twentieth century.

Survey research, mostly used by psychologists, sociologists and anthropologists, should be distinguished from sample survey, which is its close ally. The survey researcher is primarily interested in assessing the characteristics of the whole population, thus, survey research may be defined as a technique whereby the researcher studies the whole population with respect to certain sociological and psychological variables. For example, if a researcher wants to study how many people of both sexes in India adopt contraceptive devices as a measure of birth control, this will constitute an example of survey research. But a survey researcher rarely takes pains to make an approach to each member of the population or universe probably because it requires a lot of time, money and patience. Thus he takes a convenient random sample, which is considered to be representative of the whole universe and subsequently, an inference regarding the entire population is drawn. When a researcher takes a sample from the population for studying the relative incidence, distribution and relationship of psychological and sociological variables, the survey is termed as a sample survey. Survey research depends upon three important factors:

1. As survey research deals with the characteristics, attitudes and behaviors of individuals or a group of individuals called a sample, direct contact with those persons must be established by the survey researcher.
2. The success of survey research depends upon the willingness and the co- cooperativeness of the sample selected for the study. The people selected for the survey research must be

willing to give the desired information. In case, they are not willing and do not co-operate with the survey researcher, he should drop the plan in favor of some other technique.

3. Survey research requires that the researcher be trained personnel. He must have manipulative skill and research insight. He must possess social intelligence so that he may deal with people effectively and be able to extract the desired information from them.
4. In the present study researcher try to achieve four goals of research in management: Description, prediction, understanding, and creating change. Researcher used survey research method to develop detailed descriptions of behavior, often in natural settings. Survey research method allow researcher to describe people's attitudes and opinions. Researcher will able to make predictions about behavior and mental processes when he or she discover measures and observations of secondary students. Description and prediction are essential to the scientific study of behavior; researcher also seeks for understanding the "why" of behavior. We achieve scientific understanding when we identify the causes of a phenomenon.

2.1 Population

The purpose of this study is to study/examine the difference between player students and non-player students and their psychological and physical health as well as their gender differences and their overall improvements through the games. The population for this study consisted of all the secondary school students from the Chandwad tehsil.

2.2 Objectives

To study the physical education aspect of the secondary school students in relation to mental health, exercise, and assertiveness variables. It was also hypothesized that students who involved in physical education activities are show better mental health characteristics than those who are not involved in physical activities.

2.3 Hypotheses

It was also hypothesized that boys student of secondary education have better mental health than girl students. Students who involved in physical education activities are more assertive than those who are not involved in physical activities. Boys student of secondary education are more assertive than girl students. There is a positive relationship between physical education and mental health. There is a positive relationship between physical education and assertiveness.

2.4 Sample

This is a survey type research. For the present study it has been decided to choose 300 Boys and 300 Girls from Chandwad taluka. In it, 150 Boys are involved in physical education training which are selected as players and 150 boys are non-players. As well as 150 girls are involved in physical education training and 150 girls are free from physical education training and activities. Maximum care was taken to select appropriate sampling. Total 600 samples selected for the present research. All the secondary students were educated and studying in various schools. The age group of respondents was between 10 to 15years. The sample selection method was used as random sampling technique. The demographical area was limited to Chandwad tehsil. No socio- economic background was considered.

STRUCTURE OF SAMPLE

		Type of student		Total
		Players	Non-players	
Gender	Boys	150	150	300
	Girls	150	150	300
Total		300	300	600

2.5 Research Design

Present study is a type of survey research and based on random sampling. With respect to this research, the researcher will have used suitable methodology and planned an appropriate research design. 2X2 research design was carried out in this study.

**TABLE 1
2X2 RESEARCH DESIGN**

B	A	
	A1	A2
B1	B1 A1	B1 A2
B2	B2 A1	B2 A2

2.6 Selection of Variables:

2.4.1 Categorical Variables: Players, Non-player boys and girls students

2.4.2 Continuous Variables: Mental Health & Assertiveness.

2.7 Instrumentation

2.7.1 Mental Health Inventory

To assess the level of positive mental health in secondary school student, Mental Health Inventory developed by Jagdish and Srivastava (1998) has been used. In the present inventory there are 56 items including 32 false keyed and 24 true-keyed. The present inventory assesses six dimensions of positive mental health. They are-(a) Positive self evaluation (b) Perception of reality (c) Integration of personality (d)Autonomy (e)Group oriented attitude and (f) Environmental mastery. The Reliability of sub-factors of mental health were .75, .71, .72, .72, and .74 respectively. The reliability of the inventory was determined by split-half method using odd-even procedure. The table gives the reliability coefficients of different dimensions of mental health and over all. Validity of the inventory: Construct validity of the inventory is determined by finding coefficient of correlation between scores on Mental Health Inventory and General Health Questionnaire by Gold berg (1978). It was found to be .54. Besides, the inventory was validated against ‘Personal Adjustment Scale’ developed by Pestonjee (1973). The two inventory scores yield positive correlation of .57 revealing moderate validity.

2.7.2 Assertiveness inventory:

For assessing assertive behaviour of secondary students, researcher used Tasneem Naqvi’s assertiveness inventory. This test has widely used test and it has sound reliability and sound validity. This test has two parts, part one includes 35 statements and part two covers six areas of assertive behaviour.

The reliability of the inventory was calculated by the following methods (N=100): 1. Spearman-Brown Formula (Split-half method). For Part-1=.821 and Part-2=.781. 2. Kuder-Richardson Formula(Rational Equivalence method) For Part-1=.762 and Part-2=.698. Validity: Point bi-serial correlation is the test validation in which the criterion of validity is considered to be internally consistent, an item by item computation of point biserial correlation was calculated by using the formula, suggested by Garrett (1967) which shows the test is valid for the measures of assertive behaviour. The assertive end of the scale is at 0 to 4. Instruction for part-

1: For No/Never =0, For somewhat=1. For sometimes=2, Usually=3 and for practical always=4. Instruction For part –II: The following questions cover six areas that are often blocks to assertive behavior. There are two questions for each area. The first allows you to assess your attitude and irrational beliefs; the second gives you a chance to examine your behavior.. Scoring- In the part-I of this inventory, the scores 0, 1, 2, 3, 4 have already been given which mean No, Somewhat, Average, Usually and Practically Always. Add the all scores of the subject. For the part-II please note that the following answers on the questionnaire indicate assertive beliefs and behaviors:1. c 2. b 3. d 4. C 5. b 6. c 7.C 8.d 9.d 10.e 11.e 12.b

2.8 Administration of Questionnaires and data collection

The participants were approached in the secondary schools of Chandwad area. They were told that this was a research to find out the effect of physical education on mental health assertiveness. During the meeting the confidentiality was assured that their responses would be used for research purposes only. The Mental Health Inventory and Assertiveness inventory were circulated to them and asked to fill the information regarding their age, gender, class, etc. properly. It took about 45 minutes to complete both the inventories. They were told to ask if they had any doubt regarding the items.

2.9 Analysis of Data

For the present study, there were 600 randomly selected samples used for data collection. 300 players and 300 non-players are considered for test administration. In 300 players, 150 are boys and 150 girls as well as in 300 non- players 150 are boys and 150 are girls. All the students selected from various secondary schools of Chandwad tehsil area. The technique of statistical analysis, analysis of variance (ANOVA) in order to examine the roll of main variables and to study their main as well as interaction effects. Subsequently, another statistical technique termed as the least significant difference (post- hoc) test was apply to find out the significance between two means in specific pairs of sub- groups formed by different levels of mains variables. To check the relation and association between physical education mental health and assertiveness, correlation method was used.

3. RESULTS

This is a survey type research. Hence, researcher has employed and fulfills all the requirements of survey research. By using the 2x2 factorial design was used for analysis of data. ANOVA and LSD statistical techniques were used for data analysis.

TABLE. 2
ASSESSING NORMALITY OF THE VARIABLE MENTAL HEALTH
WITH DESCRIPTIVE STATISTICS.

Variable	Descriptives	Statistic	Std. Error
Mental Health	Mean	183.92	.231
	5% Trimmed Mean	182.95	
	Median	185.00	
	Variance	87.24	
	Std. Deviation	9.01	
	Minimum	154	
	Maximum	271	
	Range	117	
	Skewness	.371	.243
	Kurtosis	.288	.121

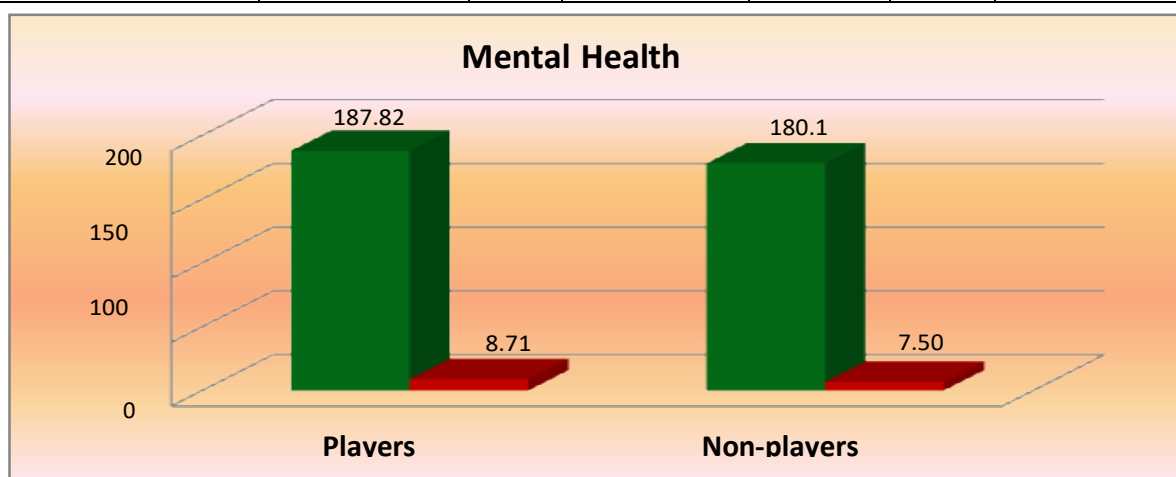
TABLE 3
DESCRIPTIVE STATISTICS: DEPENDENT VARIABLE: MENTAL HEALTH

Type of student	Gender	Mean	Std. De vi ation	N
Players	Girls	182.6400	8.59396	150
	Boys	193.0000	4.93039	150
	Total	187.8200	8.70864	300
Non-players	Girls	181.8000	5.01541	150
	Boys	178.2267	9.01017	150
	Total	180.0133	7.49625	300
Total	Girls	182.2200	7.03681	300
	Boys	185.6133	10.35929	300
	Total	183.9167	9.00935	600

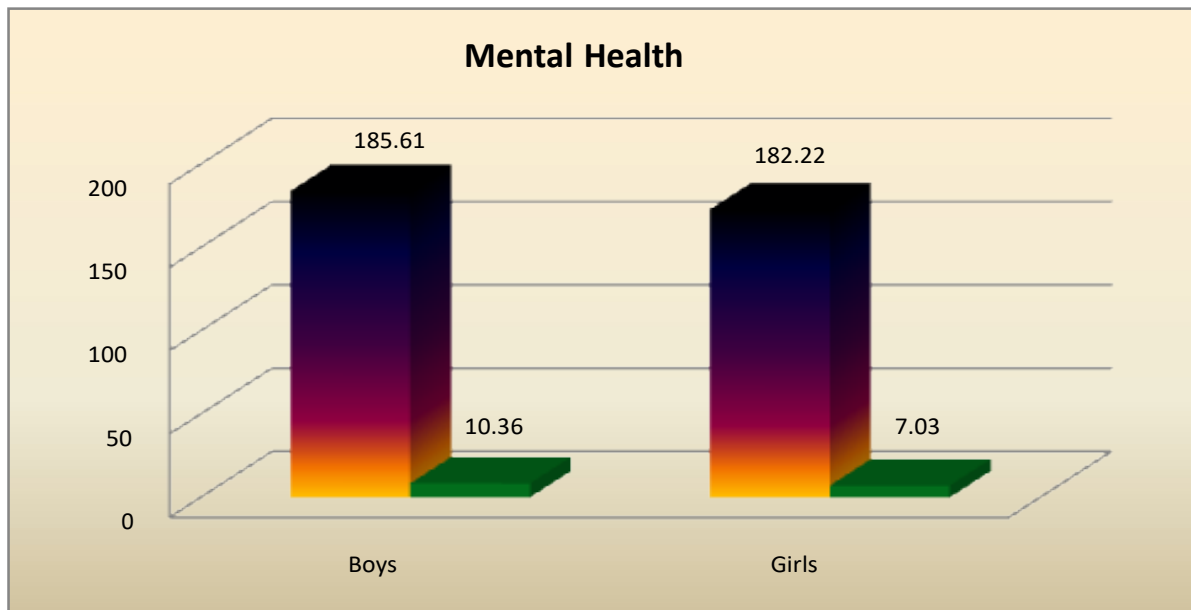
The above table provides the mean scores, standard deviations and N for each subgroup of the two independent variables and here mental health is treated as dependent variable. Inspecting the pattern of these values give us an indication of the impact of Independent Variable.

TABLE 4
ANOVA SUMMARY: MENTAL HEALTH

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Squared	Eta
Type o f Students	9141.607	1	9141.607	178.807	.000	.231	
Gender	1727.207	1	1727.207	33.784	.000	.054	
Type of students X Gender	7280.167	1	7280.167	142.398	.000	.193	
Error	30470.853	596	51.126				
Total	20343824.0	600					



Graph:1- Comparative level of mental health between Players and non- players school students



Graph:2-Comparative level of mental health between boys and girlstudents.

TABLE 5
ASSESSING NORMALITY OF THE VARIABLE POSITIVE SELF EVALUATION
A COMPONENT OF MENTAL HEALTH WITH DESCRIPTIVE STATISTICS.

Descriptive				Statistic	Std. Error
Positive Self Evaluation	Mean			34.2950	.08382
	95% Confidence Interval for Mean	Lower Bound		34.1304	
		Upper Bound		34.4596	
	5% Trimmed Mean			34.3833	
	Median			35.0000	
	Variance			4.215	
	Std. Deviation			2.05305	
	Minimum			24.00	
	Maximum			39.00	
	Range			15.00	
	Interquartile Range			3.00	
	Skewness			-1.134	.100
Kurtosis			3.226	.199	

TABLE 5.1
ASSESSING NORMALITY OF THE VARIABLE ASSERTIVENESS WITH
DESCRIPTIVE STATISTICS.

Variable	Descriptives	Statistic	Std. Error
Assertiveness	Mean	67.56	.699
	5% Trimmed Mean	67.70	
	Median	68.00	
	Variance	195.51	
	Std. Deviation	13.98	
	Minimum	26.00	
	Maximum	105.00	
	Range	79.00	
	Skewness	-.184	.122
	Kurtosis	.274	.243

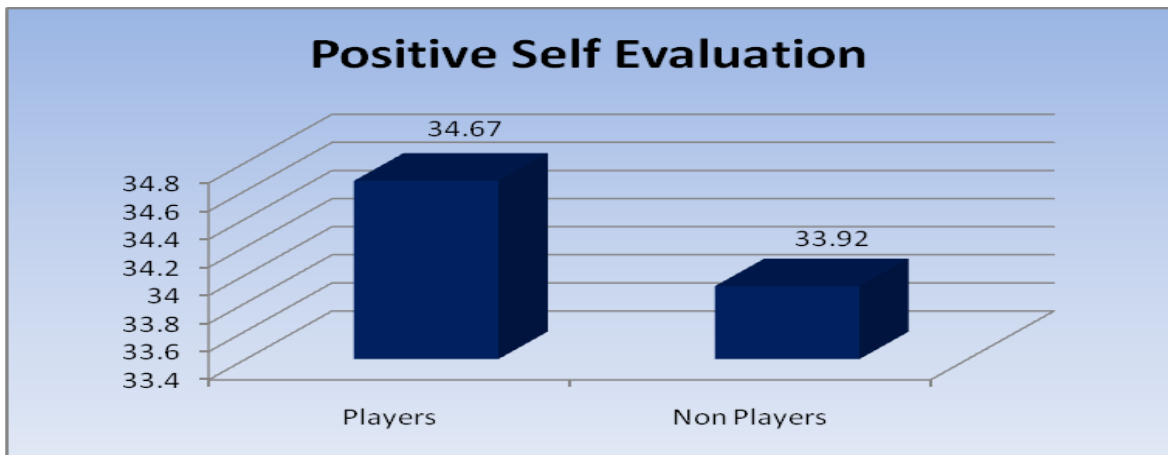
In the above table showing a descriptive statistics of whole sample (N=600). Mean is 67.56 which is close to the trimmed mean 67.70. Hence, we conclude here that the data is unaffected by extreme values (outliers) (Sheridan, J Coakes, 2006). Median (68.00) is greater than the mean (67.56) and it interprets that the distribution of scores is somewhat negatively skewed. Variance is 195.51, SD is 13.98 and the range between highest and lowest score is 79.00. The value of kurtosis (.274) is greater than 0.263, the distribution is said to be platykurtic; means distribution of scores is somewhat 'flattened'. (Julie Pallant, 2001).

It was noted that the assumption of normality, level of measurement, and random sampling did not pose any problem for the ANOVA. The above analysis indicated that the assumptions underlying ANOVA are met quite satisfactorily in the present analysis, thus justifying the presentation of ANOVA results below.

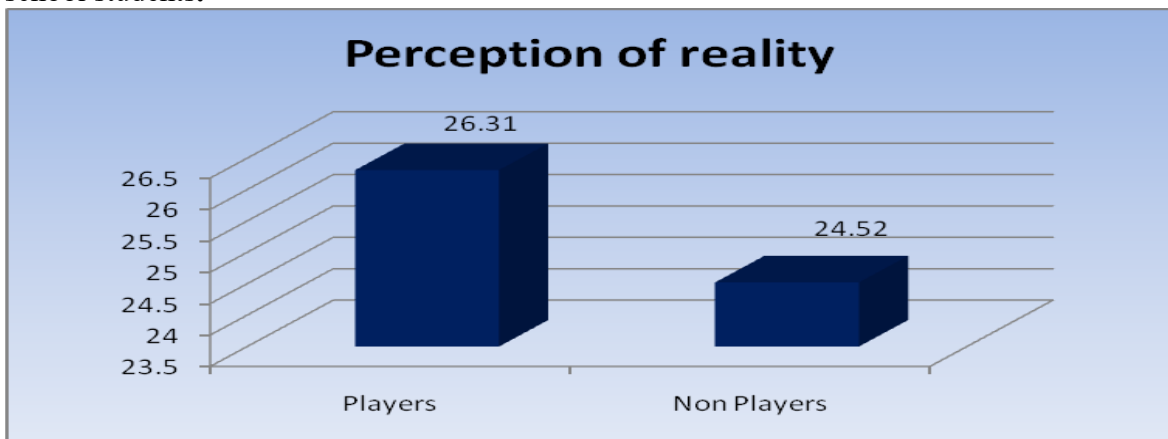
TABLE 5.2
SHOWING DESCRIPTIVE STATISTICS OF THE VARIABLE ASSERTIVENESS
ON THE BASIS OF EACH CELL.

Type of student	Gender	Mean	Std. Deviation	N
Players	Boys	69.50	12.04	150
	Girls	69.08	11.90	150
	Total	69.29	11.94	300
Non-players	Boys	65.64	15.22	150
	Girls	66.03	16.04	150
	Total	65.84	15.60	300
Total	Boys	67.57	13.83	300
	Girls	67.56	14.17	300
	Total	67.56	13.98	600

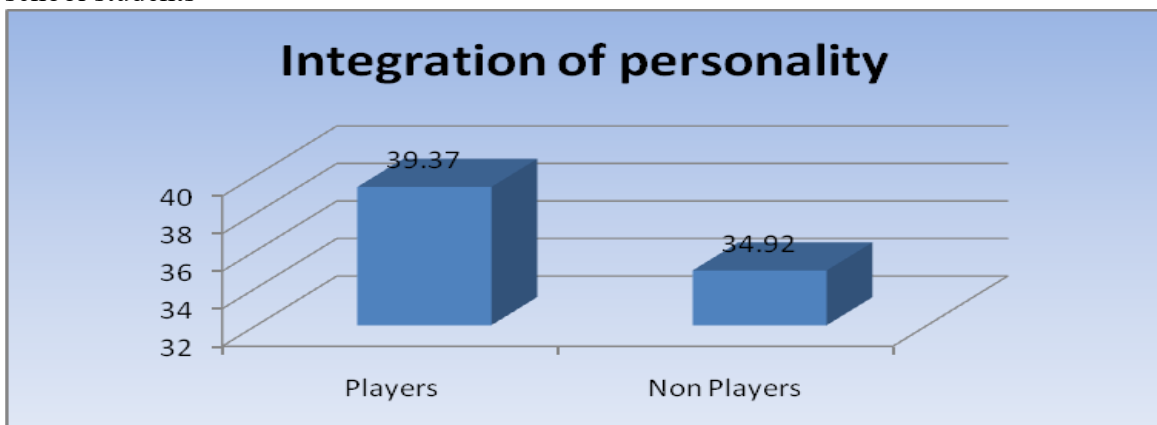
The above table provides the mean scores, standard deviations and N for each subgroups of the two independent variables and here assertiveness is treated as dependent variable. Inspecting the pattern of these values give us an indication of the impact of Independent Variable.



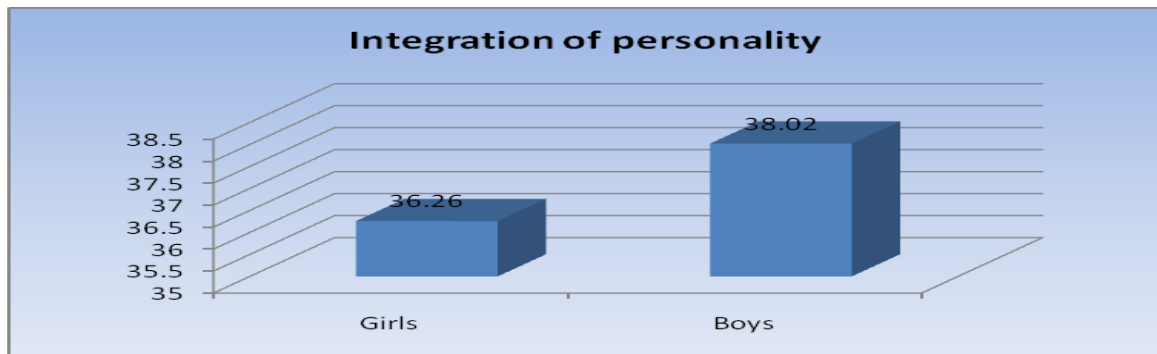
Graph: 5.2.1- Comparative level of positive self evaluation between Players and non-players school students.



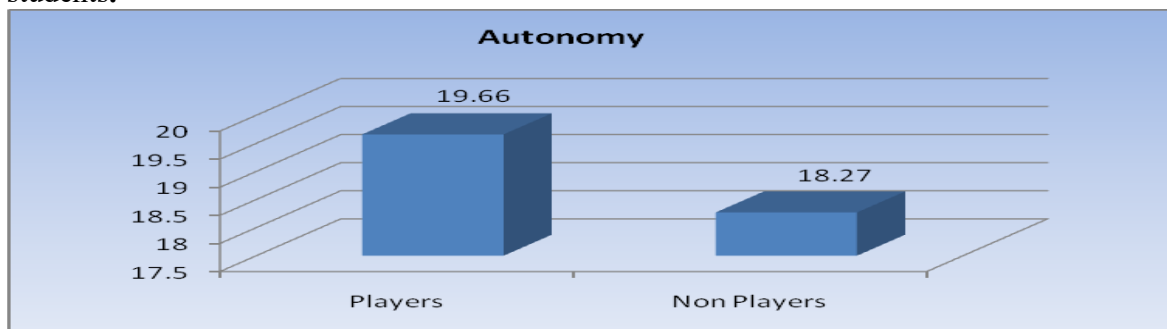
Graph: 5.2.2- Comparative level of perception of reality between Players and non-players school students



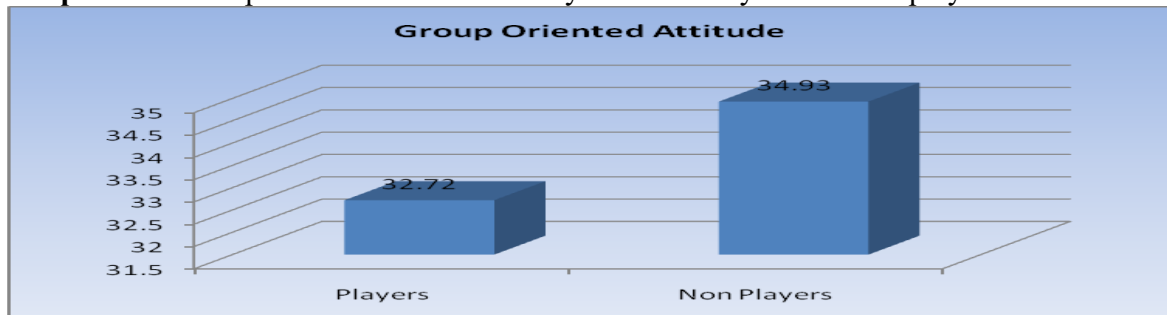
Graph: 5.2.4- Comparative level of integration of personality between boys and girl students.



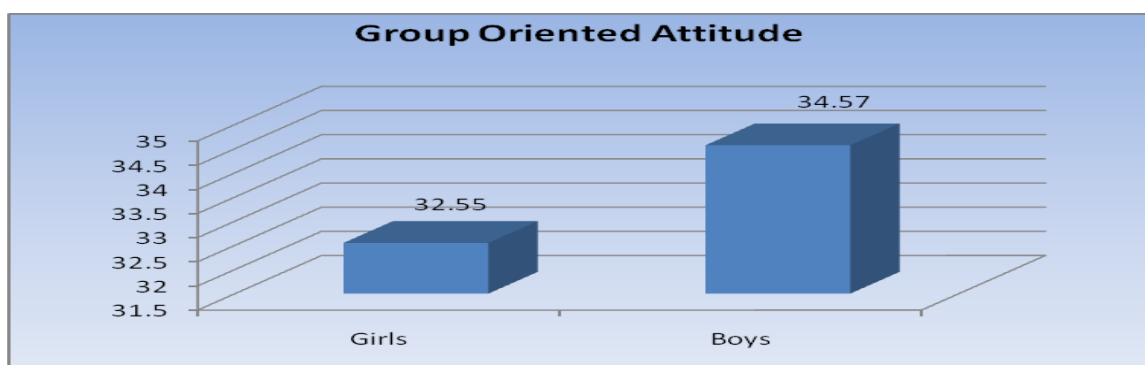
Graph: 5.2.4- Comparative level of integration of personality between boys and girl students.



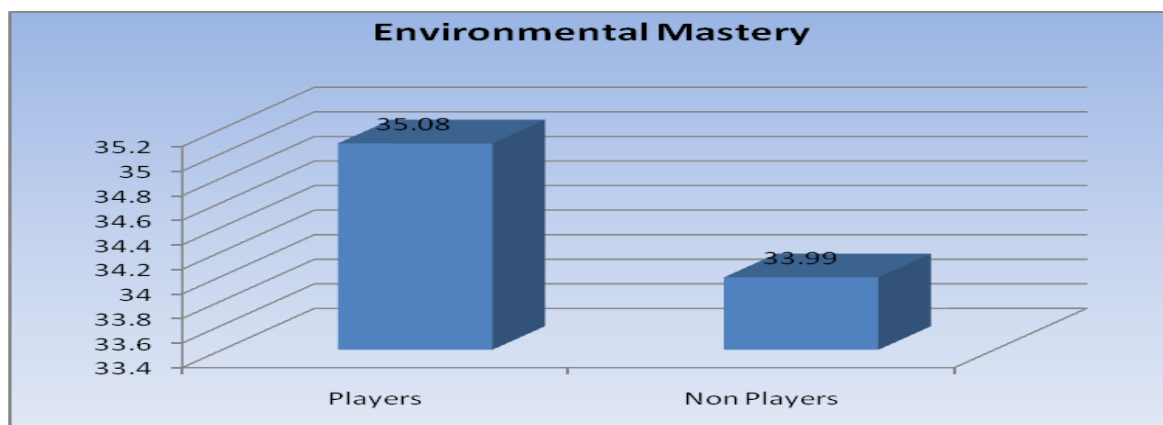
Graph: 5.2.5 Comparative level of autonomy between Players and non-players school students.



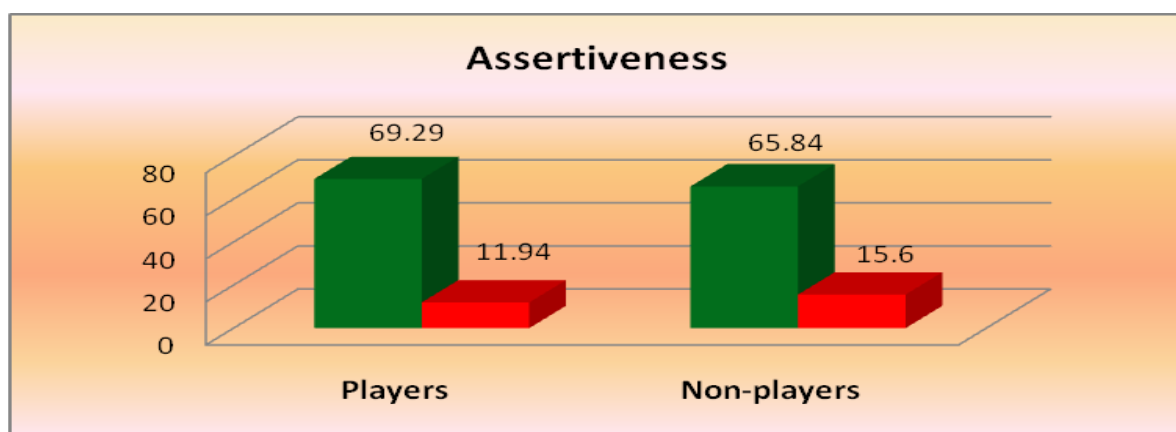
Graph: 5.2.6- Comparative level of group oriented attitude between Players and non-players school students.



Graph: 5.2.7- Comparative level of group oriented attitude between boys and girl students.



Graph: 5.2.8- Comparative level of environmental mastery between Players and non-players school students.



Graph: 5.2.9- comparative level of assertiveness between Players and non-players school students.

4. DISCUSSION

The study of the effect of physical education training and its impact on mental health, assertiveness etc. should also be made on different samples such as general population, illiterates and various sub-cultural groups so that broader generalizations may be arrived at. In this endeavor different types of training of physical exercises should be studied.

In any consideration of demographic antecedents of childrearing practices in the population from which the sample has been drawn should be studied. In this connection, studies of parent-child relationships, early childhood experience and family structure, in relation to physical exercise, are necessary. Such studies need to be made on different samples.

In one study, Tuckman, Bruce W.; Hinkle, J. Scott (2006) have been Compared the effects of running to those of the normal physical education program among 154 4th, 5th, and 6th graders who were randomly assigned to conditions. The running program consisted of 3 30-min sessions per week for 12 wks in lieu of attendance in regular physical education classes. Findings show that although boys tended to run faster than girls overall and that older children ran faster than younger children, running Ss performed better on an 800-m run, had lower pulse rates, and performed better on a test of creativity than did regular physical education participants. Running was judged effective for enhancing the cardio respiratory health and creativity of school children.

Relevance of several factors to players' aggressive behavior has been extensively studied. Sport-related factors were studied in the framework of context-personality (Isberg, 1985, 1986, 1989) or context-gender (Rainey, 1986; Kemler, 1988; Bond & Nideffer, 1992) relationship. Teams' moral atmosphere, team norms regulating aggressive acts, and players' perception of these norms are mentioned to be important in this circumstance (Stephens & Bredemeier, 1996). Difficulty of the task (McGowan & Schultz, 1989) and use of anabolic steroids (Lefavi, Reeve, & Newland, 1990) also appear to be relevant to aggression in sport. The relevance of communicating factors was also studied (Hanin, 1980) and practically discussed (Hanin, 1992).

5. CONCLUSIONS

Findings are substantial and relevant on the line of hypotheses. These salient results are mentioned here in brief.

1. The effect of physical training has been found in type of student. I.e. Students who involved in physical education activities are show better mental health characteristics than those who are not involved in physical activities‘.
2. Gender difference has found in terms of mental health. Boys student of secondary education have better mental health than girl students.
3. According to assertiveness trait of personality, it is found that students who involved in physical education activities are more assertive than those who are not involved in physical activities.
4. Assertiveness trait is equally works in boys and girls. No gender difference is found in terms of assertiveness.
5. Significant relationship is found between physical training and mental health of the students. There is a positive relationship between physical education and mental health.
6. As well as assertiveness is associated with physical education training. There is a positive relationship between physical education and assertiveness.

6. FURTHER DIRECTION FOR RESEARCH

There is ample scope to carry out the research in this area. A widespread research be carried out in the area of family related structures. Besides the variables studies in this research, the researcher can study variables such as area of residence i.e. urban and rural, caste, culture, religion, etc. Systematic studies with other standardized tools should be done on the basis of school students attitudes and aspirations about life. There should be provision of the participants with lack of infrastructure of playing materials, guidance and training centers to increase the achievement level, assertiveness and coping styles of anxiety on grass root level of resident area that will be helpful to enhance an achievement motivation among students.

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MOTIVATION, CHALLENGES AND SUPPORT FOR DUAL CAREERS OF ELITE STUDENT ATHLETES OF STATE UNIVERSITIES IN SRI LANKA.

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ABSTRACT

Although few students may achieve an elite status in sports while pursuing academic qualifications, dual careers have many positive impacts including recognition to the country and the creation of better professionals. Understanding the strengths, challenges, weaknesses and opportunities in the existing system is essential in planning and implementing successful career transition programs. In the present study, undergraduate athletes categorized as elites on the basis of performance and competition participation, were interviewed on their motivation, and perception of factors associated with dual careers. 12 who expressed consent were selected from the University of Colombo and University of Peradeniya. Interpretative Phenomenological Analysis was used as the approach to analyze the results obtained through semi- structured guided interviews on an online platform. Extrinsic and Intrinsic motivation were studied using Deductive Thematic Analysis based on Self-Determination Theory. The participants indicated a high level of motivation for a dual career during the undergraduate period, and several wished to continue their elite athletic career with an occupation based on their graduate qualifications. Many perceived that a dual career improved personal and professional development, but indicated difficulty in balancing their activities in the absence of sufficient support systems. Inflexible academic programs, lack of academic staff cooperation, financial constraints, social norms, disparity between sports, insufficient opportunities and lack of research based implementation were seen as major challenges. An absence of programs supporting dual careers has been a major obstacle for the student athletes of state universities of Sri Lanka, and future strategies require enhancing the strengths identified, while mitigating perceived challenges.

Keywords: Dual career, Career transition, Motivation

1. INTRODUCTION

The concept of dual careers has been gaining increasing interest as it promotes elite level athletes engaging in work or education while maintaining a high level of athletic performance. The European Commission (2012) identified dual careers in sports as involving the process of successfully initiating, developing and completing a career as an elite athlete through one's life course, while engaging in other activities including education and/or work. Widely recognized benefits of dual careers include creating opportunities for individuals to reach their fullest potential, enabling smooth career transitions as well as providing a sense of safety for athletes (European Commission, 2012). Moreover, implementation of dual career programs may directly and indirectly influence the life styles, health and social well-being of individuals, societies and the elite athletes as well.

However, participants who engage in dual careers are exposed to a higher level of physical and mental exertion, which in turn can lead to difficulty in balancing the athletic, academic and social roles, cause burnout and stress as well as result in a tendency to prioritize one role over another (Miller and Kerr, 2002; Sorkkila et al., 2017; Davis et al., 2019; Subijana, et al., 2015). In the face of such challenges, studies have indicated that support systems enable athletes to successfully maximize the benefits of engaging in dual careers (Geranosova and Ronkainen, 2014; Davis et al., 2019).

Condello et al. (2019) suggested that Australia, Canada, New Zealand and the United States have created formal systems which facilitate athlete engagement in dual careers, while athletes of African and Asian nations rely on less formal structures. There appears to be a greater interest in the implementation of the dual career concept in Europe, indicated by extensive literature and the EU Guidelines on Dual Careers of Athletes (European Commission, 2012).

The situation in Sri Lanka differs in relation to the structures existing in many countries mentioned above as there does not appear to be a clear conceptualization of dual careers despite the existence of elite athletes who meet the dual career criteria. Subsequently, there exists a lack of sufficient support structures. Rathnayaka (2015) identified that the opportunities for dual careers in Sri Lanka were limited by underdeveloped mechanisms for providing academic and work related opportunities to high performing athletes beyond the secondary schooling level. Poor transmission of information with regard to such opportunities, a lack of expertise in creating strategies, financial constraints and weak stakeholder involvement were also identified as obstacles. The interrelationship between sport and work has been widely viewed in terms of the positive attributes developed through moderate physical activity towards work outcomes, as opposed promoting professional sporting careers (Wimalasiri and Jayathilake, 2016; Liyanarachchi and Amarawansa 2018). Opportunities for work related dual careers are commonly seen in sports activities sponsored by large corporations aimed at mercantile tournaments as well as opportunities within the armed forces and police (Rathnayaka, 2015).

Education related dual careers appear more prevalent within the state funded universities due to the relatively larger investments on sporting facilities and opportunities for organized competition. Promotion of dual careers in this setting is likely to yield fruitful results, despite the relatively smaller fraction of the public that gain access to state sponsored higher education institutions. Current academic discourse regarding sports in state funded universities focus primarily on the participation and motivation of students towards physical activities during the period of higher education (Silva and Nayomali, 2017; Sukirthana and Arulrajahb, 2018). It can be surmised that dual career conceptualization has therefore not been fully realized or formalized within this context. This study aims to fulfill the need of a preliminary investigation of the

existing structures that underpin the performance and opportunities for elite student athletes in state funded university programs of Sri Lanka.

1.1 General Objective

To describe the motivation and the perception of factors influencing dual careers of elite student athletes of state universities in Sri Lanka.

1.2 Specific Objectives

- (i) To describe the Motivation for sports, academic activities and a dual careers.
- (ii) Perception of factors that promote or hinder dual careers of elite student athletes in state universities in Sri Lanka.

2. METHODOLOGY

12 Student athletes were recruited for the study and were interviewed via an online platform. The transcripts were generated and analyzed by the researchers according to the Interpretative Phenomenological Analysis (IPA) technique. Ethical clearance was granted by the Ethics Review Committee of Faculty of Medicine, University of Peradeniya.

2.1 Participants

16 Student athletes were invited for this study on the following criteria: 1. Being an undergraduate at either the University of Colombo or University of Peradeniya. 2. Having represented the national team/national university team at an international competition.

They were identified based on the findings of a previous study conducted by the researchers on dual career motivation of undergraduate student athletes in Sri Lanka. 12 (75%) student athletes who granted informed consent were recruited for the study. The two universities were selected as they were considered the highest ranking universities¹ in the country, and admission into these institutions required a high academic standard at a national level competitive examination. All 12 participants were native Sri Lankans. Males and females were equally represented (6 and 6), and they were aged 22 years to 26 years with a mean age of 23.58 (SD 1.31).

Also, these student-athletes have participated in international competitions such as the World cups (1), World University Games/Championships (2), Asian Games/Championships (3), South Asian Games (4), and other competitions representing the national team (5) or national university team (6). Seven of them were engaged in individual sports whereas remaining five in team sports.

TABLE 1
PARTICIPANTS' UNIVERSITY, YEAR AND FIELD OF STUDYING

Gender	UOC	UOP	2 nd Year	3 rd Year	4 th Year	5 th Year	Medicine	Management and Finance	Law	Arts
Male	5	1	2	3	1	0	1	4	0	1
Female	4	2	2	2	1	1	2	1	2	1
Total	9	3	4	5	2	1	3	5	2	2

Note. UOC – University of Colombo, UOP – University of Peradeniya

2.2 Data Collection

Data collection was done through semi structured interviews on previously decided topics; academic motivation, athletic motivation, dual career motivation, academic and sports inter- relationships, challenges for dual career and supporting structure for dual career. All

¹ The University of Colombo and University of Peradeniya are ranked as the top two universities of Sri Lanka according to the Webometrics Ranking of World Universities for 2020.

interviews were conducted by one of the researchers on an online platform. The duration of the interviews ranged from 20-30 minutes. Each researcher went through the recordings 3 times. Interviews conducted in English were transcribed directly, whereas interviews conducted in Sinhala, were transcribed in Sinhala and then translated to English resulting in 65 pages of interview transcripts.

2.3 Data analysis

Interpretative Phenomenological Analysis (IPA) was used in data analysis. IPA is a qualitative analysis method commonly used in psychology based studies (Shinebourne, P., 2011). Generally, a small sample is used to explore the in-depth experiences of participants, who are selected on the basis of their expertise in the given field.

The initial step of the analysis process consisted of reading the interview transcripts, adding notes and comments. Quotes expressing the motivation towards dual career engagement and associated factors were highlighted and codes were created. The codes were then categorized into clusters under themes. Clustered codes, along with the transcripts were cross checked by the researchers. Once all transcripts were analysed separately, they were compared and common themes were identified across all interviews.

A Deductive Thematic Analysis based on self-determination theory (SDT) was used to analyse the motivation towards dual career engagement and associated factors. SDT explains two arms in human motivation; extrinsic and intrinsic (Deci and Ryan, 2008). Developed themes were then broadly clustered into the components of SDT. Selected quotes and relevant themes are presented in results section.

3. RESULTS

The study identifies 4 major themes in relation to the motivation and perceptions of elite student athletes of state universities in Sri Lanka towards dual careers:

3.1 Motivation for sports, academic activities and a dual career

3.1.1 Intrinsic regulation

Most (83.3%) participants indicated experiencing joy, self-satisfaction and relief from stress with respect to their current participation and future goals within the academic and sporting arenas. Half of the interviewees expressed motivation toward either their academic discipline or sporting activity, while several showed some level of intrinsic motivation towards both careers. Three individuals clearly indicated motivation with respect to goals in both careers.

3.1.2 Integrated Regulation

Motivation relevant to self-awareness and identity formation was observed by some (41.6%) participants. A majority of those who expressed some level of integrated regulation indicated a long term habitual engagement in sports, incorporating an athletic identity into their sense of self. Very few participants conceptualized their identity in terms of a combined academic and athletic goal.

3.1.3 Identified Regulation

Conscious valuing and personal importance were present among many (66.6%) of the interviewees in academic activities, sports and dual career related motivation. They valued sports both for its inherent value and for its outcomes such as a positive impact on health, opportunities for social interaction as well as a sense of contribution towards the affiliated team. Valuing academic activities was linked with long term career goals. Only some interviewees attached value to the concept of attaining goals in both sporting and academic activities simultaneously.

3.1.4 Introjected Regulation

Interviewee's internal sense of reward and punishment was expressed in terms of their personal goals and ambitiousness towards a dual career. 58.33% participants held high, long term goals in sports including participation at national and international level competitions. The other 41.6% held moderate, medium to short term goals in sports such as excelling at the university level. Expected academic goals varied; a majority held moderate to high level goals, which ranged from short to long term. This included specialization in a field, post graduate education and aiming for a higher position during employment. Only two individuals held short term, low academic goals.

3.1.5 External Regulation

External factors influencing student athlete motivation was seen among 91.6% of the participants. External motivation can be identified either as direct personal impacts or indirect impacts in relation to others. The former includes social recognition, availability of opportunities in sports, academics and employment as well as convenience, while the latter includes factors such as prestige for the nation, a sense of obligation and expectations.

3.1.6 Non Regulation

Several participants (41.6%) indicated a-motivation for sports beyond the schooling or university period. The commonly cited cause was a shift in priorities as the individuals prepared to enter the workforce. Several of these student athletes (25%) did not indicate motivation towards a dual career in the future while others showed some inclination given a more conducive environment. Students of intensive academic courses² such as MBBS and LLB programs showed a greater level of non- regulation for dual career motivation beyond the university level. One participant indicated some level of a motivation towards academic activities in the long term. This can be considered as a unique case as the sport in question is well-established in the country and presents a high level of career opportunity for athletes.

TABLE 2
SUB THEMES AND SELECTED QUOTES BY PARTICIPANTS ON MOTIVATION TOWARDS DUAL CAREERS

Sub theme	Quote
Intrinsic regulation	‘So balancing both gives me that stability of mind and it’s obsessing like a stress relieving method as well.’ ‘From my childhood I always wanted to enter to a university and play my sport [...]’
Extrinsic regulation	‘Every organization is not just looking for people who have done well just in their academics. They want people who have excelled in both sports and academics [...]’ ‘[...] sir [coach] said there is no point in doing a sport if you don't have an education.’
Introjected regulation	‘No, for now my only target is to get a first class or second upper so I don’t have anything beyond that.’ ‘Especially, I wanted to win a medal for my motherland since my childhood’ ‘[...] I want to do my best at university level. My academic goal is to do Masters [...]’
Identified regulation	‘Then I felt like my sport is not important to me if I don't get an education.’ ‘[...] professionals going to those sorts of sports would also benefit the country’s national sports [...]’
Integrated regulation	‘I have done it [sports] since childhood.’ ‘[...] so sports have always been there for me to boost up my confidence and maintain it. So that’s an important part of me personally’
Non- regulation	‘[...] if you’re trying to go for a national arena competition it’s not just your practice, eating would come to play. Your rest has to be very optimal. So I don’t think that kind of a freedom I could gain with the career path that I’ve chosen.’ ‘I think students are more academics oriented. Because you get only very few students doing sports, especially in our faculty.’

3.2 Interrelationship between sports and academic activities

Participants identified an interrelationship between sporting activities and academic performance when considering both advantageous and disadvantageous outcomes of dual

² Such programs have a longer completion time, require greater number of hours of class participation and/or tend to have fewer students with extremely high academic performance on average.

careers. The major positive aspects included development of personal and professional skills and the emergence of balanced, empowered individuals. The major skills acquired included a greater sense of productivity, time management skills, ability to cope with stressful situations, formation of a strong and confident personality, and development of interpersonal skills. The chief negative outcome identified was the difficulty in adequately balancing two careers, which may lead to poor performance in both. Other concerns included the lack of time available for rest and leisure. However, most interviewees emphasized positive as opposed to negative outcomes, stating that adequate planning could minimize the disadvantages of a dual career during higher education.

TABLE 3.
SUB THEMES AND SELECTED QUOTES BY PARTICIPANTS ON THE
INTERRELATIONSHIP BETWEEN SPORTS AND ACADEMIC
ACTIVITIES

Sub theme	Quote
Advantages	‘You’re really good at managing stresses [...]’ ‘[...] when we do a sport, we develop a lot of moral values such as the ability to make instant decisions, team spirit, discipline, mental strength. Then all of them help us in our academics too.’ ‘[...] if you only do studies I think most of the time since you have more time on your hands you get lazy and you procrastinate on study also.’
Disadvantages	‘It can hinder both if you don’t prioritize them effectively.’ ‘[...] I don't think there are disadvantages. I mean, it's more like our own weakness.’

3.3 Challenges for a dual career

The most frequently cited challenge towards dual careers was financial constraints. Financial needs were viewed as vital in meeting the requirements of elite level sports, facilitating the purchase of sports equipment, access to adequate nutrition and transport facilities. The lack of consistent earnings in professional sporting careers was seen as another challenge for long term athletic motivation, extending beyond the higher education period. Also, the lack of a properly structured system with funding for student athletes in Sri Lanka was identified as another causative factor.

Negative attitudes towards sporting careers in the society, especially among parents and educational professionals resulting in fewer support structures and an inflexible education system was yet another demotivating factor. Almost all participants stated that greater understanding by academic staff regarding the value of dual careers and the situation faced by student athletes as well as the provision of more flexible schedules with their curriculum would have resulted in a greater support towards dual careers.

The next major factor was the lack of resources including infrastructure and resource persons both at the university and national levels. Additionally, inadequate information, social awareness and disparity between types of sport were seen as significant obstacles. Such issues were severe in sports that did not receive sufficient promotion at the university and national levels by sporting bodies, media personnel and other stakeholders.

Other challenges mentioned consist of constraints in time, a lack of research, insufficient opportunities for competition, physical and mental strain as well as gender norms.

TABLE 4
SUB THEMES AND SELECTED QUOTES BY PARTICIPANTS ON THE CHALLENGES FOR A DUAL CAREER

Sub Theme	Quote
Resources and financial constraints	‘A Sri Lankan sport is not like a field that you can merely just survive off of, because most of the sports persons I know do other jobs as well.’ ‘We are not rich right? Being poor, financial need is the major problem.’
Lack of dual career support structures	‘[...] the academic staff not having an understanding about the actual state of sports in the university system right now [...].’ ‘We never know when the tournaments will be, when the exams will be [...].’
Social constraints	‘Especially parents and teachers have this mentality, that only academic education is useful in life.’

3.4 Support structures for a dual career

Participants identified two forms of support structures; informal and formal. All participants stated that their colleagues and teammates offered a high degree of support, while most also expressed that parents and other friends are supportive of their needs both in a physical and psychological sense. In addition, two of the student athletes indicated support from sources such as their employers.

While formal systems provided some amount of support, it was generally viewed as insufficient. Several athletes noted that the coaches and sporting bodies within the university led by staff or students offered a fairly high amount of support in terms of motivation, facilities and funds. The support extended by the general administration was limited to certain instances of special allowances in the case of minimum class participation requirements, as well as rescheduling of examinations which take place during competition periods. The participants indicated that the lowest level of support was extended by academic staff at the university level, and teachers at the school level who were, in some instances, explicitly demotivating towards participation in sports.

TABLE 5
SUB THEMES AND SELECTED QUOTES BY PARTICIPANTS ON SUPPORT STRUCTURES FOR A DUAL CAREER

Sub theme	Quote
Informal	‘[...] from friends, from family, from some academic individuals. Yeah, the moral support is there.’ ‘I receive support from my team members.’
Formal	‘[...] there are a lot of lecturers that are helping me and also they have given me attendance allowance. So I only have to attend 50% of the lectures.’ ‘[...] they [university] give all the facilities, we have a proper coach, we have a great team, so all those things motivate me, actually it really helps me.’ ‘They should definitely be more flexible in the way they [are] giving us permission to go for these tournaments, get excused from lectures.’ ‘When we [student athletes] ask them [lecturers] whether they can teach us the lessons that we missed, they try to avoid us.’

4. DISCUSSION

The elite student athletes selected for the study indicated a high degree of intrinsic and extrinsic motivation towards sports and academic activities during the undergraduate period. Due to the limited availability of studies on dual careers in Sri Lanka, comparison of findings at the country-level is not possible. However, the high level of motivation of elite student athletes contrasts with the low level of motivation for sports activities by the general student body in state universities of Sri Lanka has been reported (**Sukirthana and Arulrajahb, 2016; Silva and Nayomali, 2017**).

Motivation towards tertiary education suggests a mixed result; some indicated an inherent desire to pursue academic goals, while others discussed the necessity of higher education for future work opportunities. The motivation for higher education as a means of financial stability is in line with the findings of **Geraniosova and Ronkainen (2014), and Puskás and Perényi (2015)**.

Only a few participants conceptualized engagement in elite level sports and academic activities explicitly as a dual career. Most participants viewed their academic and athletic identities as distinct and at times conflicting careers. This suggests that awareness on the dual career concept is not widespread, and can therefore have an impact on the tendency to prioritize one career over another. While a majority of student athletes indicated an interest in continuing an elite athletic career beyond the undergraduate level, a significant portion did not. As mentioned by **Puskás and Perényi (2015)**, a range of factors affect the decision to prioritize one career and terminate the other including sport-specific factors such as whether the sport is an individual or team event, the general age at which an athlete reaches their peak performance, future goals, support systems and the intensity of the academic and athletic programmes. Providing adequate support systems and flexibility in academic and athletic schedules therefore appears to play a role in promoting dual careers beyond the undergraduate period.

In discussing the interrelationship between the academic and athletic careers, participants appeared to be motivated by the perceived advantages of doing both sports and education at an elite level. This included personal development, increased availability of opportunities, and the ability to achieve one's full potential. Although facing difficulty in maintaining a high performance in both careers, time constraints, and sacrificing other interests were perceived as some of the disadvantages of dual careers, most participants interviewed did not appear to be highly demotivated by these perceptions. Similarly, **Geraniosova and Ronkainen (2014)** also have suggested that despite low levels of formal support, elite student athletes are willing to manage their dual careers. Therefore, increasing support would both serve to improve the performance of existing elite student athletes, and encourage students with athletic potential to engage in dual careers.

Moreover, the study identified the major challenges indicated by the elite student athletes in the context of the state university system of Sri Lanka. The most commonly cited obstacle for a dual career was financial constraints. However, due to the publicly funded university system, financial concerns with respect to academic activities was not emphasized, although several studies conducted in other countries highlighted the cost of tuition and accommodation as well (**Wilson and Pitchard, 2005; Simiyu, 2010**). Financial instability in professional athletic careers was also perceived as a major future obstacle. And at a broader level, participants indicated the disparity in the national resources among countries which affect the outcome of athletes at international level competitions.

Participants perceived the lack of formal dual career pathways to be associated with an inflexible education system, inadequate information and awareness on dual careers and disparities among sports. In addition to this, interviewees identified challenges that were commonly seen

among elite level student athletes in a global context. These included time constraints and the physical and mental strain of dual careers (Davis et al., 2019; Subijana et al., 2015; Gomez et al., 2018).

The necessity in enhancing the available support structures was also emphasized. Proper support is crucial in developing dual career competencies of students which enable them to properly navigate their two-fold career (Wylleman and Rosier, 2016; Puskás and Perényi 2015; Condello et al., 2019). With regard to the existing support system, participants perceived a high degree of informal support. However, formal support including that extended by the academic staff and university administration was insufficient and at times, detrimental to the motivation towards dual careers. Many preceding studies also highlight the importance of improved support extended by these bodies towards elite level student athletes (Kristiansen, 2016; Marinšek, 2015; Brustio et al., 2020).

5. CONCLUSION

Despite the difficulties of managing an academic and athletic career at a high-performance level, elite student athletes of state universities in Sri Lanka appear to be highly motivated towards engaging in dual careers during their undergraduate period. Many also indicate a desire to continue their athletic careers beyond this period, given certain external factors to facilitate their needs.

It appears that while the overall attitude towards dual careers remains positive, elite student athletes encounter several major challenges requiring more comprehensive policies and support structures. While constraints may exist on meeting the needs of athletes with regard to enhancing national level resources and facilities, more easily addressed issues include providing greater access to existing facilities and convenient, nutritious food. Other actionable concerns involve provision of financial and administrative support including increased academic flexibility for elite student athletes. Greater awareness on dual careers may be achieved through awareness programmes aimed at the general public, parents, academic and administrative staff and students at secondary and tertiary educational levels. In addition, increased research in the area of dual careers is essential in providing effective strategies for intervention.

6. RECOMMENDATIONS

- 6.1 A course of action recommended by the authors on the issue of financial constraints faced by elite student athletes within state universities, is the implementation of athletic merit based scholarships, similar to existing academic merit based scholarships. Facilitating dual careers is also likely to improve with greater support extended by academic staff and the administration through the use of online learning tools, providing additional support on request and enacting more flexible schedules for high performance athletes.
- 6.2 At present, there remains a need for further research on this topic within Sri Lanka especially with a wider representation of sports, academic fields and backgrounds, as well as considering the perspectives of other relevant stakeholders such as staff, coaches, sporting and educational bodies and family members.

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THE EFFECT OF AN ADAPTIVE LOCAL INDIGENOUS GAMES THERAPY ON AGGRESSION IN EDUCABLE MENTALLY RETARDED PEOPLE

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ABSTRACT

The study aims to investigate the effect of adaptive local indigenous games on aggression in educable mentally retarded people. The Experimental and field study was a quasi-experimental. The statistical population of this research comprised girls and boys with mental disabilities who are studying in exceptional children's primary schools in Chaharmahal and Bakhtiari province in the academic year of 1998-99. Among them, 40 people, whose IQ was equal to 50 to 70 in the Raven IQ test, were randomly chosen as the sample. The analysis tools of the study were the aggression questionnaire of Bahrami et al. (2008), the Wineland Adaptive Behavior Questionnaire, and the Henderson and Sagden (1992) Children's Motion Assessment Test (M-ABC). Shapiro-Wilk test, Levin test, Pearson correlation coefficient and univariate covariance analysis were used to analyze the data. It should be noted that all steps of data analysis were implemented using SPSS software version 23 at a significance level of 0.05. The results revealed that a course of adaptive local indigenous games had a significant effect on the aggression of educable mentally retarded children. And has improved aggression in educable mentally retarded children. According to the results, local indigenous games can be practiced to improve the aggression of educable mentally retarded children.

Keywords: Indigenous and local games, aggression, mentally retarded people, Chaharmahal and Bakhtiari

1. INTRODUCTION

Mental retardation is one of the perceptual-motor disorders of growth that happens before adolescence and specifically refers to children who lack cognitive mechanisms and some adaptive behaviors (Jaydari et al., 2017). People whose IQ is between 51 and 70 are educable. These people do not acquire concepts. Their concentration and precision are limited and they do not exhibit any motive to learn, which may be due to the failures they have faced during learning (Izadi, 1396). The mentally retarded child's wants are similar to those of a normal child. This means that a retarded child also requires psychological, physical, and emotional motives to put into practice his abilities and become active and acceptable in society (Baroff & Olley, 2014). However, mentally retarded children need more opportunities and special educational programs to achieve this goal. On the other hand, the communication problems of these children, along with their other difficulties, play a critical role in the use of educational techniques. Therefore, one of the main purposes of educating these children is to approach a level of ability to communicate effectively with others and their surroundings. Some researchers, such as Kephart, Berk, and Piaget, assume that movement and motor learning are the origins of all perceptions, learnings, and And higher mental processes appear after the evolution of motor and perceptual systems and the establishment of a relationship between movement learning and perception (Bradinova et al., 2005).

Behavioral disorders are one of the most common childhood disorders. In a study of the natural people, the prevalence of these disorders in the United States among school-age students was 8.6% (Hunt et al., 2002, quoting Khoshabi, 2007). Exposure of children and adolescents to risk factors increases the above statistics. For example, the prevalence of behavioral disorders in unwanted children is significantly higher (Malek Khosravi and Zadeh Mohammadi, 2007). Approximately 50% of children and adolescents who are cared for in under-protected centers have behavioral disorders (Kiel and Price; quoted in Mehrabi, 2005).

In the appearance of emotional behavioral disorders, a single factor couldn't be responsible, but a variety of factors related to parents and family patterns and some social, cultural, and revealing factors contribute to its emergence. Some risk factors result in the development of behavioral disorders. These factors include experiencing emotional and social problems such as parental problems (such as alcohol or drug use), poverty, deprivation, abuse, rejection, unsatisfactory relationships, parental mental disorders, or traumatic events (Sadeghi, 1392). One of the common characteristics in children with disobedient stubbornness is weak social status, which leads to impaired social and educational functioning in childhood (Samara et al., 2006) and the occurrence of unacceptable behaviors, violence, negative moods, and coping behaviors (Pring Shim et al., 2015). These people are disregarding the social norms and rules of conduct that are appropriate to age. Some of them are aggressive, quarreling, stealing from inside or outside the house. They lie, threaten others, run away from home and school, engage in sexual activity at an early age, join criminal gangs, destroy other people's property, and Usually do not have friends or have very few friends.

Children need versatility and physical activity to express themselves and acquire new skills, strengthen their sense of self-confidence and reveal their social competencies, and at the same time basis for their adult life (Sohrabi and Adolzadeh, 2016; Ganji and Mohammad Ismail, 2015). Developed countries of the world believe that the main foundations of learning and people's personality are established in childhood. play and exercise or exercises in the form of children's games can make your child too healthy and familiar with teamwork and make thinking practical. Exercises that come with play are the best way to turn physical exercise into fun

(Ghasemnezhad, 2015) According to Piaget and Vigotsky, play is the central determinant in a child's cognitive development. Neuromuscular and perceptual-cognitive growth of the child owes to the child plays during the early years when the brain is being developed with increasing quantity and quality. The golden age of child growth goes through play, and in the natural process of play, children first understand and recognize themselves and then the outside world (Henderson, 2011). Numerous researchers' findings have revealed that increasing physical activity in individuals, will improve the performance of tasks that require executive functions and flexibility (Predovan, 2012; Arjmandnia et al. (2017) in a study that examined the effectiveness of physical education programs on enhancing the social competence of mentally retarded students in the Pre-professional course stated that physical education programs had a positive, significant effect on their cognitive skills and behavior. Zeleznikow-Johnston et al. (2017) and Kangasniemi et al. (2014) revealed that exercise and having an active lifestyle improve cognitive flexibility. Play as a motivating factor is an appropriate tool for gaining personal pleasure in a child's life. There are many movement exercises in each game that can encourage children to participate in physical activities (Akay & Bratton, 2017). All children love to play. Among these, children with mental retardation exhibit a special wonder about play, mainly due to various reasons, such as feeling out of class and curricula and serious activities that usually lead to evaluation. They exhibit most of their strength and energy while playing (Ritziet al., 2017). Paying attention to this special feature, the optimal use of pleasant opportunities while playing to convey the educational message directly and indirectly in a verbal and non-verbal manner and the development of cognitive actions is critical (Salter et al., 2016; Robinson et al., 2017). Among these, indigenous and local games compared to other games, due to their cultural and value infrastructure, can play an essential role in the development of skills required for life (Ghajji et al., 2013). Among the numerous games, Iranian domestic games are very important; Because they are rooted in the creativity of their predecessors and have been established in a suitable socio-cultural context, and with the optimal use of minimum facilities and space, create maximum sensory-nervous stimulation and in proportion to the ability of individuals, they increase perceptual-motor and cognitive-emotional capabilities. Indigenous Iranian games have distinct types and levels, each of which generally stimulates the nervous system and makes the child active, and while creating vitality and nervous preparation, causes arousal and interaction of sensing and decision making parts. Perceptual and decision-making of the child (Asghari Nekah, 2009). Due to the difficulties, limitations, and disabilities of mentally retarded people, it may be reasonable to practice indigenous, local games to promote their basic movements and cognitive and behavioral traits. The development of basic skills, the use of games with a cultural and therapeutic approach, and perhaps their philosophy and logic are among the features that underline the significance and necessity of paying attention to them.

Despite the description of the above issues regarding the effectiveness of indigenous, local games, the issue of these games on the development of basic skills has been less studied and most research has centered on the impact of physical activity. Therefore, the study aims to investigate the effect of adaptive local indigenous games on aggression in educable mentally retarded people. The researcher seeks to find an answer to the question of whether a course of adaptive local indigenous games affects the aggression of educable mentally retarded children.

2. METHODOLOGY

2.1 Sample

The statistical population of this research comprised girls and boys with mental disabilities who are studying in exceptional children's primary schools in Chaharmahal and Bakhtiari

province in the academic year of 1998-99. Among them, 40 people, whose IQ was equal to 50 to 70 in Raven's advanced matrix form tests for adults, were randomly chosen as the sample and classified into two groups of control (20 people) and experimental (20 people).

2.2 Research Design

The Experimental and field study was a quasi-experimental. The research plan included a pre-test-post-test with the control group and an independent variable (12-week adaptive local game training program) on aggression in mentally retarded people.

2.3 Procedure

The necessary permits, as well as the necessary coordination, were acquired from the education department of Chaharmahal and Bakhtiari province, for the presence of the educators. Students were then tested for Raven IQ and students with an IQ of 50 to 70 who were trained as mentally retarded students were selected. Then, the medical reports of educable mentally retarded students were carefully reviewed, and people with difficulties such as autism, severe mobility restrictions in the joints, a history of surgery, severe visual and hearing impairment were excluded. Among these 40 students were randomly divided into control and intervention groups. Ultimately, in a meeting with the presence of parents and students (participants), the research method was fully described and the permission form was completed by the parents. Initially, pre-test was performed, which included the aggression questionnaire of Bahrami et al. (2008). Then, 36 sessions of 45-minute game therapy were conducted during 12 weeks and three sessions per week, and after the last session, play therapy was performed by post-test samples. How to hold play therapy sessions was to warm up for 10 minutes at first.

Warm-ups include walking on the line forward, moving to the right, moving to the left, moving backward, walking on a spiral line for eye-hand-foot coordination, walking with hand movement (Right-hand rotation, left-hand rotation in different directions up, down, left, and cross) butterfly movement, opposite hand and foot movement. After warming up for 30 minutes, play therapy was performed, which was divided into two parts of 15 minutes, and one game was played every 15 minutes. The last 5 minutes of the sessions were also devoted to cooling.

2.4 Statistical Analysis

To analyze the data after confirming the default of normal distribution of research data in different groups using the Shapiro-Wilk test, Levin tests, Pearson correlation coefficient, and univariate analysis of covariance were applied to test research hypotheses.

3. RESULTS

It should be noted that all steps of data analysis were performed using SPSS software version 23 at a significance level of 0.05 and data pertaining to this , has been presented in Table 1 to 4 and depicted in figure 1

TABLE 1
DESCRIPTION OF THE AGGRESSION VARIABLE

Variable	Groups	Mode	Mean	SD
Aggression	Control	Pre-test	2.28	0.171
		Post-test	2.26	0.170
	Experimental	Pre-test	2.36	0.169
		Post-test	1.89	0.169

Based on the results from the table above, the average aggression in the control group was 2.28 ± 0.171 at the pretest and 2.26 ± 0.170 at the post-test. Also, the average aggression in the experimental group at the pre-test was 2.36 ± 0.169 and 1.89 ± 0.169 at post-test. Accordingly, the

dispersion of aggression variable data is low and the subjects had almost the same perception of aggression in terms of the average score in the pre-test.

Before analyzing the hypotheses data, they were examined to ensure that they comply with the underlying assumptions of analysis of covariance. The first hypothesis is the same as the assumptions of analysis of variance. The measurement variable is quantitative, the observations are independent, the distribution of variables is normal, and there is a homogeneity of variance. The second presupposition is the normal correlation of co- variances. The third presupposition is the normal correlation of covariance and the fourth, which is also the most basic assumption of analysis of covariance, is the linear and significant relationship between the covariance and the dependent variable.

TABLE 2
NORMAL DISTRIBUTION OF AGGRESSION VARIABLE SAMPLE DATA

Groups	Mode	df	Statistics	Significance
Control	Pre-test	20	973/0	815/0
	Post-test	20	0/945	0/293
Experimental	Pre-test	20	0/960	0/536
	Post-test	20	0/955	0.452

Based on the results, regarding the significance level for the Shapiro-Wilk test is more than 0.05, the assumption of normal distribution of aggression data in pre-test and post-test and the control and experimental groups is confirmed.

TABLE 3
HOMOGENEITY OF VARIANCE BETWEEN DEPENDENT VARIABLES

Variable	df	Degree of 1 Freedom	F-value	Significance
Aggression	2	1	2.002	0.165
	38	1		

According to the results, homogeneity of variance is established between the dependent variables of this study.

TABLE 4
TESTING THE EFFECTIVENESS OF AN ADAPTIVE LOCAL GAMES ON THE AGGRESSION OF EDUCABLE MENTALLY RETARDED CHILDREN

Resource	Mean Squares	df	Sum of Square	F- value	Partial Squared Coefficients	Significance
Modified Model	2.262	2	2.262	129.765	0.875	0.001
Control	0.000	1	0.000	0.051	0.001	0.822
Pre-test	0.842	1	0.842	96.541	0.723	0.001
Group	1.897	1	1.897	217.596	0.855	0.001
Error	0.009	37	0.323			
Total		40	175.662			
Modified Total		39	2.585			

According to the results, the significance level of the pretest is less than 0.05, which means that the presumption that the relationship between the independent variable and the auxiliary variable (covariance) is linear has been perceived.

The results also revealed that there was a significant difference between the research groups in terms of aggression score ($P = 0.001$) which suggests that the adaptive local games had a significant impact on the aggression of educable mentally retarded children and it has reduced their aggression. The ETA partial squares coefficient also shows that 85.5% of the variance of the dependent variable (post-test) is explained by the independent variable, which means that 85.5% of the aggressive changes are due to a course of adaptive local games.

Estimating the marginal mean of the aggression

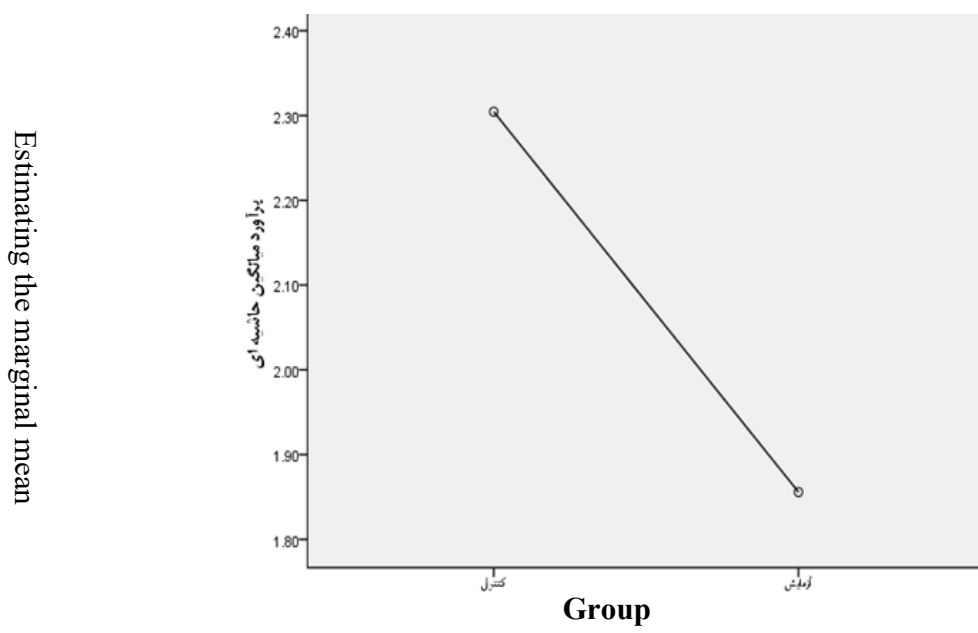


Figure :1-Estimating the marginal mean of the aggression post-test

4. DISCUSSION

The results showed that a course of adaptive local indigenous games has an effect on the aggression of educatable mentally retarded children, which is consistent with the results of Nazarpour and Badami (2016), Kazemi et al. (2016), Shahrakipour et al. (2015), Rajeh et al. (2016).

Human aggression is any behavior that is directly intended to harm another person. Aggression may take many forms. Its verbal and physical form represents the instrumental or behavioral components, anger represents the emotional aspect and hostility represents the cognitive aspect of aggression. From a psychoanalytic point of view, finding opportunities to vent aggressive actions will reduce aggressive tendencies, and the accepted term for this process is emotional evacuation. On the other hand, one of the weaknesses that mentally retarded children may face is the lack of social skills, which causes them to feel frustrated and inadequate (Boyd, 2014). This confuses these children in establishing social relationships and as a result, they become aggressive (Wood and Gadow, 2010). The physical expression of anger and aggression in a safe play therapy environment can assist our children to recognize their anger, vent it, and develop an appropriate expression of anger.

As Shahrakipour et al. (2017) suggests, group play therapy with a cognitive-behavioral approach has had a positive effect on reducing the components of behavioral disorders (separation anxiety, hyperactivity/attention deficit, and stubborn disobedience) in primary school children with disorders. Although aggression is part of a child's emotional development process,

it can be problematic if it gets out of control and causes harm to the child and those around him. Therefore, new methods should be sought to promote social interactions and reduce aggression in children, especially children with mental retardation. Indigenous-local games have reduced aggression in mentally retarded children.

According to Kazemi et al. (2016), indigenous games have a positive effect on motor development and aggression of preschool children and have suggested that preschool centers use indigenous games to improve motor development and reduce aggression in children. Indigenous games have increased social interaction in these children, and as the problem of communicating with others resolves, their aggression will greatly diminish. On the other hand, the ups and downs that exist in indigenous-local games and their great excitement cause the venting of negative energies and aggression in these children. Jumping up and down, hitting, punching, cause venting the negative emotions and aggression in these children. Also, Nazarpour and Badami (2016) have stated that local indigenous games and rhythmic yoga movements have a positive effect on aggression and adaptive behavior of girls with intellectual disabilities. Also, local indigenous games have led to a greater reduction in aggression compared to rhythmic yoga movements. Rajeh et al. (2016) also stated that play therapy reduces ADHD in children. Therefore, to control aggression in educable mentally retarded children, measures should be considered to provide a platform through which these children can participate in indigenous games. In fact, by managing the families of these children, even before school age, it is possible to provide the setting for the participation of these children in indigenous-local games.

5. CONCLUSION

The results showed that a course of adaptive local indigenous games has an effect on the aggression of educable mentally retarded children, Therefore, it can be said that play-therapy of indigenous-local games can have a positive effect on controlling aggression in children with mental retardation.

The results also revealed that there was a significant difference between the research groups in terms of aggression score which suggests that the adaptive local games had a significant impact on the aggression of educable mentally retarded children and it has reduced their aggression.

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