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Effect of 6 Week SAQ Agility Training Program on Improving Fitness and Flexibility of College Level Male Cricketers

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Abstract: Purpose: To determine the effect of 6 week SAQ agility training program on improving the physical fitness and flexibility of college level cricketers.
[Material and method]: 30 cricketers participated in this study. Participants of the study was randomly grouped into 30 (n=30). Compare of pre (day 1) and post (day 28) . The initial testing took place before the beginning of the pre-season period while the final testing was performed after 4 weeks of intervention with the SAQ training method. The agility training group participated in a 4 week exercise program performing a variety of SAQ agility exercises designed
[Result]: The 2-t Confidence level of all tests shows significant change observed i.e. null hypothesis is rejected and alternate hypothesis is accepted, so that we observed significant improvement in fitness & flexibility of the college level male cricketers after 6 weeks SAQ agility training program under strict prescribed technical norms.
[Conclusion] Hence we concluded that Overall, based on results of this study and previous research, it can be said that effect of 6 week SAQ agility training program on improving fitness & flexibility among the college level male cricketers is significantly observed so the null hypothesis is rejected and alternate hypothesis is accepted.
Keyword: SAQ, BMI, CDC, WHO, GTO.

I. INTRODUCTION

The game of cricket has developed to such an extent that millions of people take part and many more around the world take an interest through the media to watch the game. The cricketers supervised educated by the coach, trainer and physical education teacher. Sport specific training is basically fitness and performance training design specifically for sport performance enhancement and which include areas such as strength , speed, power endurance, flexibility, mobility, agility, mental preparedness (including goal setting) sleep, recovery /regeneration techniques and strategies, nutrition , rehabilitation , rehabilitation and injury risk reduction.[1] Agility has classically being defined simply not only the ability to change direction rapidly[2] but also the ability to change direction rapidly and accurately[3] . A new definition of agility is proposed by Sheppard and Young, 2006[4] as "a rapid whole body movement with change of velocity or direction in response to a stimulus " which has relationships with trainable physical qualities such as strength , power and techniques, as well as cognitive components such as visual scanning techniques , visual scanning speed, anticipation. Agility testing is generally confined to tests of physical components such as change of direction, speed, or cognitive components such as anticipation and pattern recognation. Agility training is thought to be a reinforcement of motor programming through neuromuscular conditioning and neural adaptation and muscle spindle , golgi tendon organs [GTO] and joint proprioceptors[5-7] . Performance is often dependent on the athelete's jumping ability during offensive and defensive skills.[8]
The multidimensional movement demands of field and court games dictate a revaluation of the traditional approach to the development of the agility. This demands a systematic multifactor approach that results in significant improvement in game speed .Full development of coordinative abilities provides a range of motor skills that can be adapted to deal with sport specific movement demands [9]. Categorization imply that the SAQ (speed , agility and quickness) training method should be a useful component of fitness training in cricketers (pearson , 2001). A typical SAQ session involves explosive movements with the goal of progression from fundamental movements (yap and brown , 2001). Hence this form of training is thought to encourage the adaptation of movement mechanics , length and frequency of steps and increased hip height in the pursuit of increased speed, agility and quickness (pearson , 2001) . Most authors define 'physical fitness' as the capacity to carry out every day activities without excessive fatigue and with enough energy in reserve for emergencies. Emphatically this definition is inadequate for a modern way of life. By such a definition almost anyone can classify himself as physically fit Gatchell (1977). "Physical fitness is not only one of the most important keys to a healthy body, it is the basis of dynamic and creative intellectual activity." (John F. Kennedy) .

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Health and physical fitness have a vital role in the life of men from time immemorial . the progress of the Nation lies in the hands of the people , who are healthy and physically fit. A sports is an activity in our lives where pursuits of different movement achieved through the total investigation of Neuro-muscular coordination . In this modern era , we can see that each and every individual directly or indirectly related to sports. Modern Physical Education commonly known as there is sports where pursuit of discipline freely formed such as biological, social and physical sciences.

Fitness is a broad term denoting dynamic qualities that allow to satisfy the needs regarding mental, emotional stability special consciousness and adoptability spiritual and oral fear and organic health are consistent with heredity. Physical fitness means the organic system of the body are healthy and function efficiently vigorous tasks and leisure activities beyond organic development, muscular strength and stamina . physical fitness implies efficient performance in exercises **Bucher and Prentice** (1985).[10]

II. REVIEW OF LITERATURE

(2018) Zahoor Ahmad Bhat et al in their study "Effect of Cricket Specific Training on cricket batting ability among college level men cricketers of J & K state" Conducted that "The result of the study revealed that the training group has significant improvement in cricket batting ability among college level men cricket players after the cricket specific training protocol. It was also concluded that this cricket specific training is one of the best training methods for increasing the cricket batting ability and as well as the physical fitness of cricket players."[11]

(2018) Dr. Zehra Certel et al in their study "Professional experience, tolerance, empathy and reading interests as variables predicting cognitive flexibilities of physical education teachers" conducted that "The level of cognitive flexibility , tolerance and empathy of physical education and sport teachers are quite high, but their interest in reading is moderate. When the coefficient of correlation between cognitive flexibility and empathy, tolerance and professional experience in a positive way, but no significant relationship with the interest in reading. As a result, empathy , tolerance and professional experience are found as predictors of cognitive flexibility , whereas the interest in reading is not a predictor variable."[12]

(2016) Bashir Ahmad Mir , Abdul Roof Rather and Waseem Hassan Raja et al in their study " effect of 4 week conditioning programme on selected physical fitness components of novice junior hockey players of Kashmir " concluded that "4 –week conditioning programme did increase the flexibility of the players significantly. As a result, showed that in cardio – vascular Endurance no significant differences were found" .[13]

(2016) Tom Hollenstein et al in their study "A Model of Socioemotional flexibility at three time Scales" concluded that, "Flexibility is a dynamic process. That is necessarily includes a temporal component as flexibility can only be observed as a change (or lack of change) over time. We have presented a conceptual model of flexibility at three time scales- micro, meso and macro- in order to provide a definitional framework for flexibility theory and research. Consideration of different time scales provides an account of flexibility (a) within a given context or situation, (b) as an adaptation to changing demands across different contexts, and (c) as a model of meta-descriptive characteristic or trait. Thus, our Flex 3 model accounts for both contextual and temporal parameters." [14]

(2015) Bekir Mendes et al in their study, " Examination of Flexibility and sprint performance values of adolescent Footballers" concluded that Flexibility and sprint performance values in adolescent players examined in this study and findings compared with the literature. Applied in physical fitness test batteries, sit – and – reach test protocol is used to determine the flexibility of children ; photocells were used to determine the 10 meter and 20 meter sprint performance.[15]

(2013) Zoran Milanovic et al in their study, "Effects of a 12 week SAQ training programme on agility with and Without the Ball among Young Soccer Players" concluded that "The seven different phases of a specific speed and agility (SAQ) training programme (Pearson, 2001) contributed to a statistically significant improvement in performance in different agility tests with and without the ball U19 soccer players. Whilst is impossible to determine which any individual components had significant and non-significant contributions the overall effect led to an improvement in agility. These findings support the contention that the SAQ programme should be a part of routine soccer training. The extent to which SAQ training needs to be further investigated as it appears anecdotally that agility training, form any teams, is not undertaken to the extent that it should be. Research suggests that appropriate SAQ training will improve soccer players' agility and condition them to cope with actual demands of the game."[16]

(2011) Kenneth P. De Meuse in their study "The development and validation of a self assessment of learning agility" concluded that "Our goal was to design and validate a self assessment instrument to measure learning agility. In addition to assessing overall learning agility, we desired to measure various facets of learning agility to provide individuals feedback on where are their strengths and growth areas. Using the well established LFE Structured interview approach and the multi-rater choices assessment as guide,The following five different factors of learning agility were incorporated in the newly developed via EDGE^{JM} instrument.[17] (Mental Agility 2-People Agility 3- Change Agility 4- Results Agility and 5- Self – Awareness)"

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(2010) Mohammadtaghi Amiri- Khorasani et al in their study " Acute Effect of different Strengthening methods on Illinois Agility test in Soccer Players" conducted that "The findings of this study showed that significant differences in agility time were achieved comparing (a) The dynamic stretching vs. static methods. (b) The dynamic vs. combined methods, and (c) no stretching vs. static stretching. The dynamic method showed shorter completion time (13.95± 0.32 seconds) compared with the static stretching method (14.90±0.38 seconds), which suggests that all the players performed better in the IAT when incorporating the dynamic stretching component within the warm up protocol."[18]

(2009)Tim Gabbett et al in their study "Reactive Agility of Rugby League Players" conducted that "The purpose of this study was to investigate the reactive agility of rugby league players, to determine if this quality discriminated higher and lesser skilled players. The results of this study demonstrate that decision and movement times on the reactive agility test were faster in higher skilled players, without compromising response accuracy. The finding of superior anticipatory skill in the elite players had a greater ability to extract relevant information earlier in the visual display, by identifying relevant postural cues presented by the tester and disregarding irrelevant sources of information."[19]

(2009) Patrick M.Holmberg et al in their study "Agility Training for Experienced Athletes: A Dynamical Systems Approach" conducted that "The lack of an agreed on definition has hindered investigations on agility. Testing has also failed to identify those aspects most important to agility. Therefore, an inclusive teaching model is exclusive. Moreover, the absence of effective training programs appears to be a product of such uncertainty. Hence, coaches often encounter difficulty employing methodologies that seek to improve this key component of athletic performance."[20]

(2007) Oleksandr S. Chernyshenko et al in their study "Constructing Personality scales under the assumptions of an ideal point response process: toward increasing the Flexibility of personality Measures" conducted that adoption of the ideal point approach provided a more flexible platform for creating future personality measures, and this transition did not adversely affect the validity of personality test scores.[21]

(1998)Mathew M. Martin et al in their study," The Cognitive Flexibility Scale: Three validity studies" conducted that Together, These three studies offer support for the validity of the cognitive flexibility scale. The results of study one show that cognitive flexibility is competence, Assertiveness and Responsiveness. In study two, Individuals assessments of their own cognitive flexibility were positively related to ratings from their friends. Three showed a positive relationship between being cognitive flexible and confidence in performing communication behaviours. Thus, these studies provide additional support for the scale as a measure of cognitive flexibility: Since flexibility is an essential component of communication competence, attention should be paid to this communication construct."[22]

(1998) William D Bandy et al in their study, "The Effect of static stretch and dynamic range of motion training on the flexibility of the Hamstring muscles" Conducted that " although the use of static stretch and DROM both resulted in an increase in hamstring flexibility (as determined by increased knee extension ROM), the results of the present study indicate that a 30 – second static stretch was more effective than the DROM technique. Given that a 30 second static stretch performed one time per day over a 6-week period resulted in more than twice the gains in hamstring flexibility than performing DROM at the same frequency and duration , the use of DROM to effectively increase the flexibility of the hamstring muscle is in question."[23]

(1994) William D Bandy et al in their study "The Effect of time on static stretch on the flexibility of the Hamstring muscles." Conducted that "The results of this study suggest that duration of 30 seconds of stretching the hamstring muscle was as effective time of stretching for enhancing the flexibility of the hamstring muscle occurred by increasing the duration of stretching from 30 to 60 seconds, the use of the longer duration of stretching for an acute effect must be questioned."[24]

(1986) Henry N. Williford et al in their study ," Evaluation of warm -up for improvement in Flexibility" conducted that "Suggestions have been made that at least 5 minutes of gradually progressive muscular exercise such as brisk walking, jogging, or cycling should precede the stretching routine in an effort to warm the muscles and connective tissue prior to stretching."[25]

(1985) Dan Wallin et al in their study ,"Improvement of muscle Flexibility " ; conducted that "It is obvious from this study that passive stretching of a muscle after a short (7-8 seconds) isometric contraction of the muscle allows for a greater lengthening of the muscle and an increased range of motion of corresponding joint than the classic BS method. The physiologround for this is not clear."[26]

(1983) Alexander A. Sapega , MD , Gary Drillings , BS et al. intheir study , "the definition and assessment of muscular power " ; concluded that "although strength (force output) and power (work/time) are quantitatively related, they remain separate physical parameters that can be measured in all dynamic muscular contractions, whether fast or slow."[27]

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III. HYPOTHESIS

A. Null Hypothesis

Effect of 6 week SAQ agility training program on improving the physical fitness and flexibility of college level cricketers is NOT EFFECTIVE .

B. Alternate Hypothesis

Effect of 6 week SAQ agility training program on improving the Physical fitness and flexibility of college level cricketers is EFFECTIVE .

IV. METHODOLOGY

A. Subjects

Total 30 Subjects was taken according to the Inclusion and Exclusion criteria, Those who satisfied the criteria was allowed to perform the study.

B. Space And Location

All Subjects was taken from KANPUR SOUTH ACADEMY , KIDWAI NAGAR ; KANPUR.

C. Selection Criteria

1) Inclusion Criteria

a) Participants agreed with the purpose of this study .
b) Participants had no existing musculoskeletal problems.
c) *AGE Group:* 19- 24 years
d) *Gender:* male only .
e) *Participants:* college level cricketers.

2) Exclusion Criteria

a) Recent Injury
b) Trauma of lower limb
c) Fracture
d) Not willing to participate
e) Ligament reconstruction
f) Sprain /strain
g) Neurological patients
h) Musculoskeletal injuries
i) None of the participants were injured before the initial testing or during the training programme.
j) Nutritional supplements should not be included in their diets.
k) Participants should not take exogenous anabolic – androgenic steroids or other drugs that might affect their physical performance or hormonal imbalance during the study.
l) Psychological patients .

D. Variables

1) Dependent

a) Standing broad jump
b) Push ups
c) Sit ups
d) 600m run
e) 50m dash
f) 10×4 shuttle run.
g) Sit and reach.

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2) Independent
a) SAQ Agility training protocol
b) Agility training sessions.

E. Study Design
Selective Controlled Trial

F. Equipments
1) CONE
2) BALL
3) BOX
4) WHISTLE
5) MEASURING TAPE
6) WEIGHING MACHINE
7) STOP WATCH

V. PROCEDURE

The initial testing took place before the beginning of the pre-season period while the final testing was performed after 4 weeks of intervention with the SAQ training method. To prevent unnecessary fatigue accumulation ; players were instructed to avoid intense exercise for a 24 hour period before each testing session . Immediately prior to testing participants performed a standard 25- minute warm-up consisting of 10 minute of light running , 10 min of dynamic stretching and 5 × 30m of running exercises.
Participants of the study were randomly grouped into 30 (n=30). Compare of pre (day 1) and post (day 28) .
All the participants agreed not to change or increase their current exercise habits during the course of the study . Participants were fully informed and signed a consent form.
All agility tests were performed on a grass sports field and the players wore cricket spikes in order to replicate competitive playing conditions. The agility training group participated in a 4 week exercise program performing a variety of SAQ agility exercises designed –

1) *Slalomtest:* Each participant started the test with his feet behind the start line. Six cones were set up 2 m apart, the first cone 1m away from the starting line, with his feet apart and the cone between his legs . He then started running after the sound signal and ran from point to point . The player at the second point had to be passed on his right-handed side. The player continued to run as fast as possible constantly changing direction from right to left , until he reached the player standing at the last point. After the last point, the player made a 180^{0} turn and continued the slalom to the starting line. The interclass correlation coefficient for test – reset reliability for the slalom test was 0.90.
2) *Slalom Test with Ball:* this test was structurally the same as the SL test but differed in that it was performed with the ball. The interclass correlation coefficient for test-retest reliability for the slalom test with the ball was 0.88.
3) *Sprint with 90^{0} Turns:* Each of the participants commenced the test with their feet behind the start line . They started from the first point after the second signal, ran as fast as possible to the second point and performed a 90^{0} turn to the right . On reaching the second point they continued to run to the third point where they performed a 90^{0} turn to the left . At the fourth point , they performed another 90^{0} turn to the left and ran on to fifth point , where they performed a 90 turn to the right. Point sixth had the same direction and turning angle (90^{0} turn to the right) . at the point seventh , they performed a turn to the left and ran on to the finishing line point the track was 15m long , the distance between the start line and the first flag was 3m , between the second and the third flag 2m, between the third and the fourth 2m , between the fourth and the fifth 5m , between the fifth and the sixth 3m, between the sixth and the seventh 3m , between seventh and eighth 2m and between the flag ninth 2m. The interclass correlation coefficient for test-retest reliability for sprint with 90^{0} turns was 0.92.
4) *Sprint with 90^{0} Turns with Ball:* The test structure was the same as the S90 test , but differed only in that it was performed with the ball. The intraclass correlation coefficient for test –retest reliability for sprint with 90^{0} turns with ball was 0.86.
5) *Sprint with 180^{0} Turns:* Each participant started after the second signal and ran 9m from starting line A to line B (the lines were white , 3m long and 5cm width). The 180^{0} turn was performed with the participants being asked to put a foot over the line on inversion. Having touched line B with one foot , they made either a 180^{0} left or right turn. All the following turns had to be performed in the same direction. The players then ran 3m to line C , made another 180^{0} turn, and ran 6m forward. Then they

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made another 180^0 turn (line D) and ran another 3m forward to line E , before performing the final turn and running the final 9m to the finishing line F. The intraclass correlation coefficient for test –retest reliability for the sprint with 180^o turn was 0.96.

6) *Sprint with Backward and Forward Running:* The distance covered was the same as in the previous test ($S180^0$) . The only difference was that instead of making a turn , the player shifted from forward to backward running. After the starting sound signal, they ran 9m from the starting line A to line B (the lines were white, 3m long and 5cm wide). Having touched the line B with one foot the players shifted from running forward to running backward. Then they ran 3m to line C and changed from backward running to forward running. After 6m , the players made another a change (line D) and ran another 3m backward (line E) and then made the final change and ran the final 9m forward to the finishing line F. The intraclass correlation coefficient for test –retest reliability for sprint with backward and forward running was 0. 92.
7) *Sprint 4× 5m:* The test required players to perform constant changes in the direction. 5 cones were set up 5m apart . The players stood with their feet apart and the cone between their legs. Every player started after the second signal and ran 5m from point A to B after reaching pint B , he made a 90^0 turn to the right and then shuffled 5m to the point C. At the point C he made a 90^0 turn and ran to point D , were he made a 180^o turn and ran on to point E (the finishing line). The intraclass correlation coefficient for test –retest for reliability for sprint 4×5m was 0.90. Participants performed 2 trails agility test, with a recovery of approximately 3mins between trails. All test used in this study have previously been shown to be reliable and valid (Sporis et al . , 2010 a)

A. *V Sit Reach Test*

This test measures the flexibility of the lower back and hamstring muscles . the test is very similar to the sit and reach test , though no box is required . this following describes the procedure for the v sit as used in the president's challenge fitness awards, which is an alternative to their sit and reach test .

1) *Equipment Required:* A tape for marking the ground marker pen and ruler. With the tape mark a straight line two feet long on the floor as the baseline ,and a measurement line perpendicular to the midpoint of the baseline extending two feet on each side. Use the marker pen to indicate every half inch along the measurement line the point where the baseline and measuring line intersect is the zero point.
2) *Pre-test:* Explain the test procedure to the subject. Perform screening of health risks and obtain informed consent. Prepare forms and record basic information such as age, height, body weight, gender, test conditions. Perform an appropriate warm-up.
3) *Procedure:* The subject removes their shoes and sits on floor with measuring line between their legs and the soles of their feet placed immediately behind the baseline, heels 8-12 apart. The thumbs are clasped so that hands are together, palms facing down and placed on measuring line. With the legs held flat by a partner, the subject slowly reaches forward as far as possible, keeping the fingers on baseline and feet flexed. After three practice ties, the students holds the fourth reach for three seconds while that distance is recorded. Make sure there are no jerky movements, and that the fingertips remain level and the legs flat.
4) *Scoring:* The score is recorded to the nearest half inch as the distance before or beyond the baseline.
5) *Validity:* This tests only measures the flexibility of the lower back and hamstrings, and is a valid measure of this.
6) *Advantages:* This test does not require specific testing equipment such as required for the similar sit and reach test.it is an easy and quick test to perform requiring minimal equipment
7) *Disadvantage:* variation in arm leg and trunk length can make comparison between individuals misleading. the modified sit and reach test attempts to account for this differences

Lower back flexibility is important because tightness in this area is implicate in lumbar lordosis, forward pelvic tilt and lower back pain

B. *Floor Touch Test*

This test measures the flexibility of the lower back and hamstring muscle similar to what is measured with the sit and reach test .the test is part of the Kraus –Weber fitness test protocols, a series of six medical fitness test measures the strength and flexibility of key postural muscles .

1) *Purpose:* To measure the flexibility of lower back and hamstring muscle .lower back flexibility is import because tightness in this area is implicated in lumbar lordosis , forward pelvic tilt and lower back pain
2) *Equipment Required:* Stop watch
3) *Pre Test:* Explain the test procedures to the subject. Perform screening of health risk and obtain informed concent. Prepare forms and record basic information such as age, height, body wt, gender and test conditions .

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4) Procedure : the subject stand erect bare footed , hands at sides and feet together . The subject is asked to lean down slowly to touch the floor and with their finger tips for 10 seconds bouncing and jerking is not allowed . The examiner holds the knees straight in order to prevent any bending.

5) Scoring: This test is graded on a pass fail basis the test is pass if the subject hold the position correctly for ten second .the Kraus –weber test comprises six exercises being unable to perform even one of the six exercises results in failing the test over all

6) Advantage: This is a very simple test to conduct which h can be perform quickly with minimal equipment.

Agility was assessed by Illinois agility test; anaerobic power, lower limb reaction time and balance were assessed by kinematics measurement system and flexibility was assessed by v- sit reach test and floor touch test.

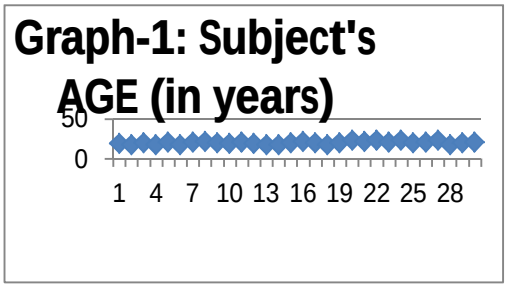
Time session	Agility training	Set/repetitions
Week1(day1-6)	20-yard shuttle 30 yard t-drill squirm 40-yard sprint 40 yard-backpedal forward	3 sets of 10 repetitions
Week2 (day1-6)	Same as week 1	5 sets of 10 repetitions
Week3(day 1-6)	40 yard square-carioca 15-yard turn drill figure eights z-pattern run zigzag	3 sets of 10 repetitions
Week4(day 1-6)	Same as week 3	5 sets of 10 repetitions
Week 5(day 1-6)	40 yard square drill-sprint,single leg ,hop,backpedal Star drill-sprint,backpedal,shuffle 5-conesnake drill 180-degree turn Crossover shuffle	3 sets of 10 repetitions
Week 6(day1-6)	Same as week 5	5 sets of 10 repetition

VI. RESULT

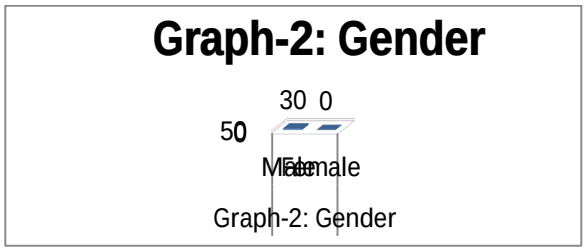
TEST	SD	T	DOF	2-t Confidence Level
STANDING BOARD JUMP	0.140185	31.9868	8	**100%**
PUSHUPS	8.698	4.2375	8	**99.72%**
SITUPS	10.31236	7.5478	8	**99.99%**
50M-DASH	0.827826	14.4386	8	**100%**
600M-RUN	0.172056	4.7452	8	**99.85%**
10X4 SHUFFLE RUN	2.236219	9.4858	8	**100%**
SIT & REACH TEST	0.9826072	13.3654	8	**99.34%**

The 2-t Confidence level of all tests shows significant change observed i.e. null hypothesis is rejected and alternate hypothesis is accepted, so that we observed significant improvement in fitness & flexibility of the college level male cricketers after 6 weeks SAQ agility training program under strict prescribed technical norms.

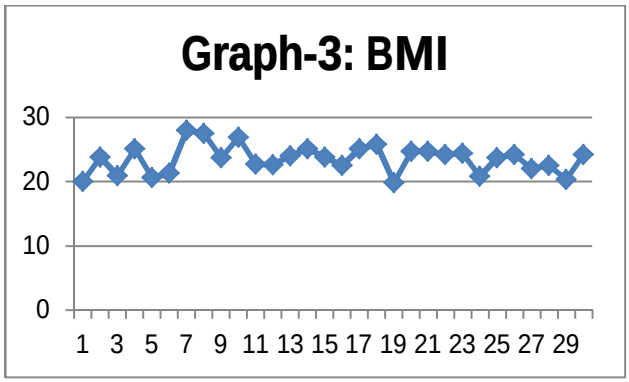
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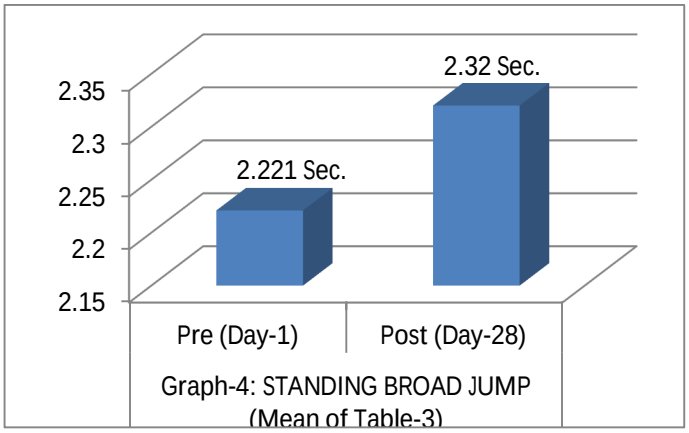
Graph-1: Represents the Age wise distribution of all study subjects, A finding shows mean age (±SD) is 21.23 (±4.64) years, which represents young aged participants.



Graph-2: Represents the Gender wise distribution of all study subjects, A finding shows all 30 subjects are male & no female subject.

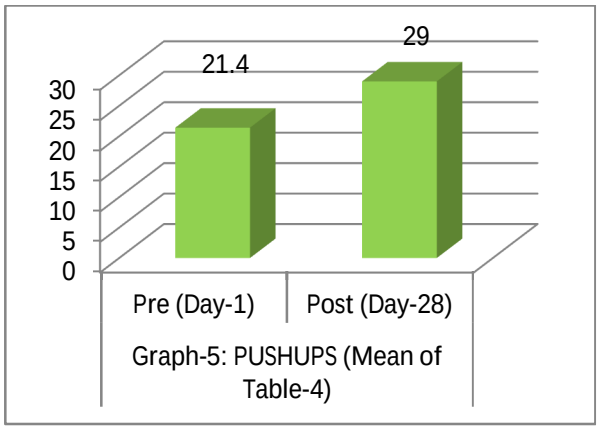


Graph-3: Represents the Body Mass Index (BMI) wise distribution of all study subjects, A finding shows mean age (±SD) is 22.69 (±3.89), which represents normal healthy participants.

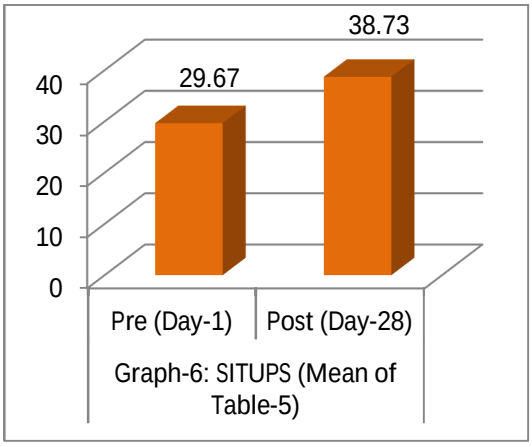


Graph-4: Represents the duration of Pre & Post Standing broad jump wise distribution of all study subjects participants., A finding shows (±SD) is 0.14 (±1.81), which represents significant improvement in Pre to post reading in all

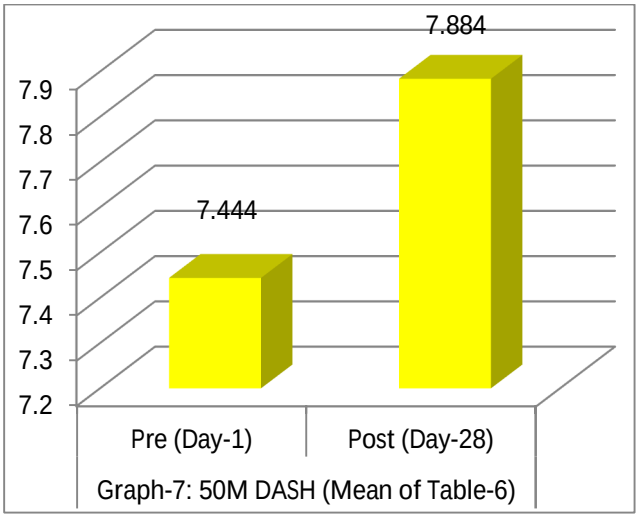
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Graph-5: Represents the duration of Pre & Post Pushups wise distribution of all study subjects, A finding shows (±SD) is 8.698 (±1.27), which represents significant improvement in Pre to post reading in all participants.

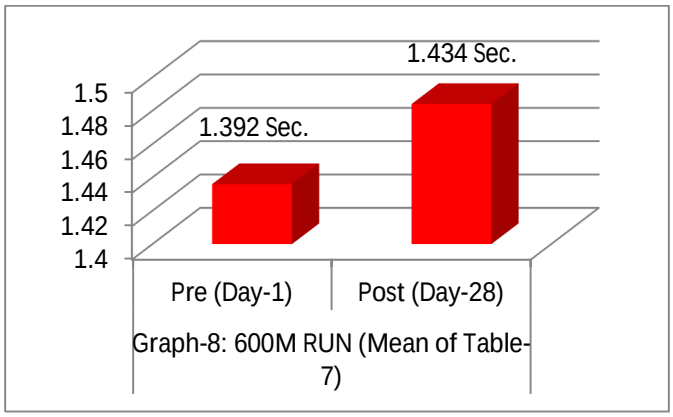


Graph-6: Represents the duration of Pre & Post situps wise distribution of all study subjects, A finding shows (±SD) is 10.31 (±1.31), which represents significant improvement in Pre to post reading in all participants.

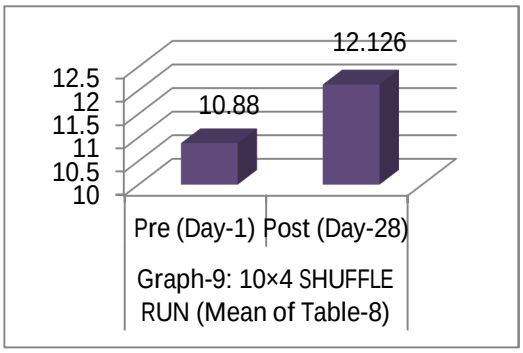


Graph-7: Represents the duration of Pre & Post 50M-Dash wise distribution of all study subjects, A finding shows (±SD) is 0.828 (±1.11), which represents significant improvement in Pre to post reading in all participants

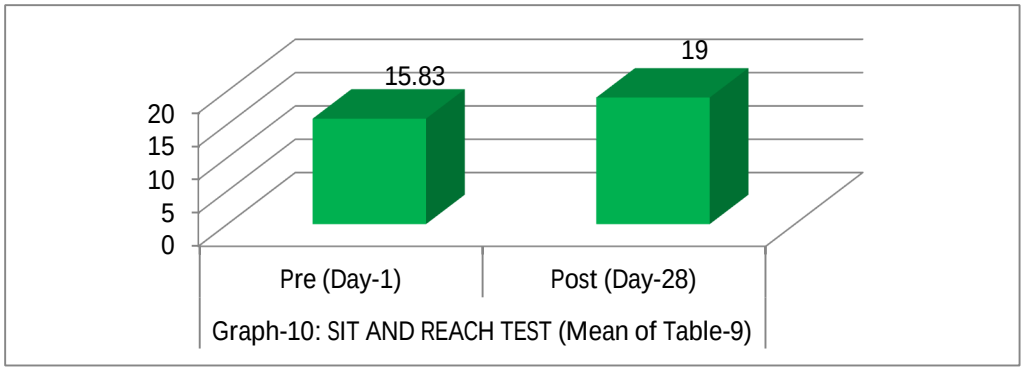
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Graph-8: Represents the duration of Pre & Post 600M-Run wise distribution of all study subjects, A finding shows (±SD) is 0.172 (±1.34), which represents significant improvement in Pre to post reading in all participants.



Graph-9: Represents the duration of Pre & Post 10X4 Shuffle Run wise distribution of all study subjects, A finding shows (±SD) is 2.236 (±1.77), which represents significant improvement in Pre to post reading in all participants



Graph-10: Represents the duration of Pre & Post Sit & Reach test wise distribution of all study subjects, A finding shows (±SD) is 0.983 (±1.47), which represents significant improvement in Pre to post reading in all participants.

VII. DISCUSSION

Total 30 subjects were taken according to the inclusion & exclusion criteria, those who satisfied the criteria were allowed to perform the study, total 30 subjects successfully completed the study.

All the subjects were taken from Kanpur sports academy, Kanpur on inclusion criteria such as gender male, young cricketers aged between 19 to 24 years with no existing musculoskeletal problems. We excluded the subjects with recent fracture/sprain/strain at beginning or during study, we cant allowed any nutritional supplements in diet & participants also not allowed to take anabolic-androgenic steroids or any other drugs that might affect their physical performance or hormonal imbalance prior/during the study.

Zahoor Ahmad Bhat et al (2018) conducted that the result of the study revealed that the training group has significant improvement in cricket batting ability among college level men cricket players after the cricket specific training protocol.

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It was also concluded that this cricket specific training is one of the best training methods for increasing the cricket batting ability and as well as the physical fitness of cricket players; as we found in our study too.

Zoran Milanovic et al (2013) **i** n their study concluded that the seven different phases of a specific speed and agility (SAQ) training programme (Pearson, 2001) contributed to a statistically significant improvement in performance in different agility tests with and without the ball U19 soccer players. Whilst is impossible to determine which any individual components had significant and non- significant contributions the overall effect led to an improvement in agility. These findings support the contention that the SAQ programme should be a part of routine soccer training. The extent to which SAQ training needs to be further investigated as it appears anecdotally that agility training, form any teams, is not undertaken to the extent that it should be. Research suggests that appropriate SAQ training will improve soccer players' agility and condition them to cope with actual demands of the game; we also concluded the same conclusion in our study.

We also support that Agility testing is generally confined to tests of physical components such as change of direction, speed, or cognitive components such as anticipation and pattern recognation. Agility training is thought to be a reinforcement of motor programming through neuromuscular conditioning and neural adaptation and muscle spindle , golgi tendon organs [GTO] and joint proprioceptors . Performance is often dependent on the athelete's jumping ability during offensive and defensive skills, so its shows significant improvement in flexibility & fitness level.

A. Clinical Implications

These data suggest that young cricketer participants who successfully completed the 6 weeks SAQ agility program have significant improvement in fitness and flexibility level, as all 7 protocols including standing board jump, Pushups, Situps, 50M-Dash, 600M-Run, 10X4 shuffle run, Sit&run test shows significant outcome.

B. Future Research

This study was conducted for a short period only, future research involving a longer time period & comparing the effects of the two intervention program is possible, not only in cricketers but other sports specifications.

C. Limitation Of The Study

A small sample size was one of the major limitation of the study. Many participants injured during study due to other activities as its difficult to restrict other physical sports activities 6wk long duration

VIII. CONCLUSION

Hence we concluded that Overall, based on results of this study and previous research, it can be said that effect of 6 week SAQ agility training program on improving fitness & flexibility among the college level male cricketers is significantly observed so the null hypothesis is rejected and alternate hypothesis is accepted.

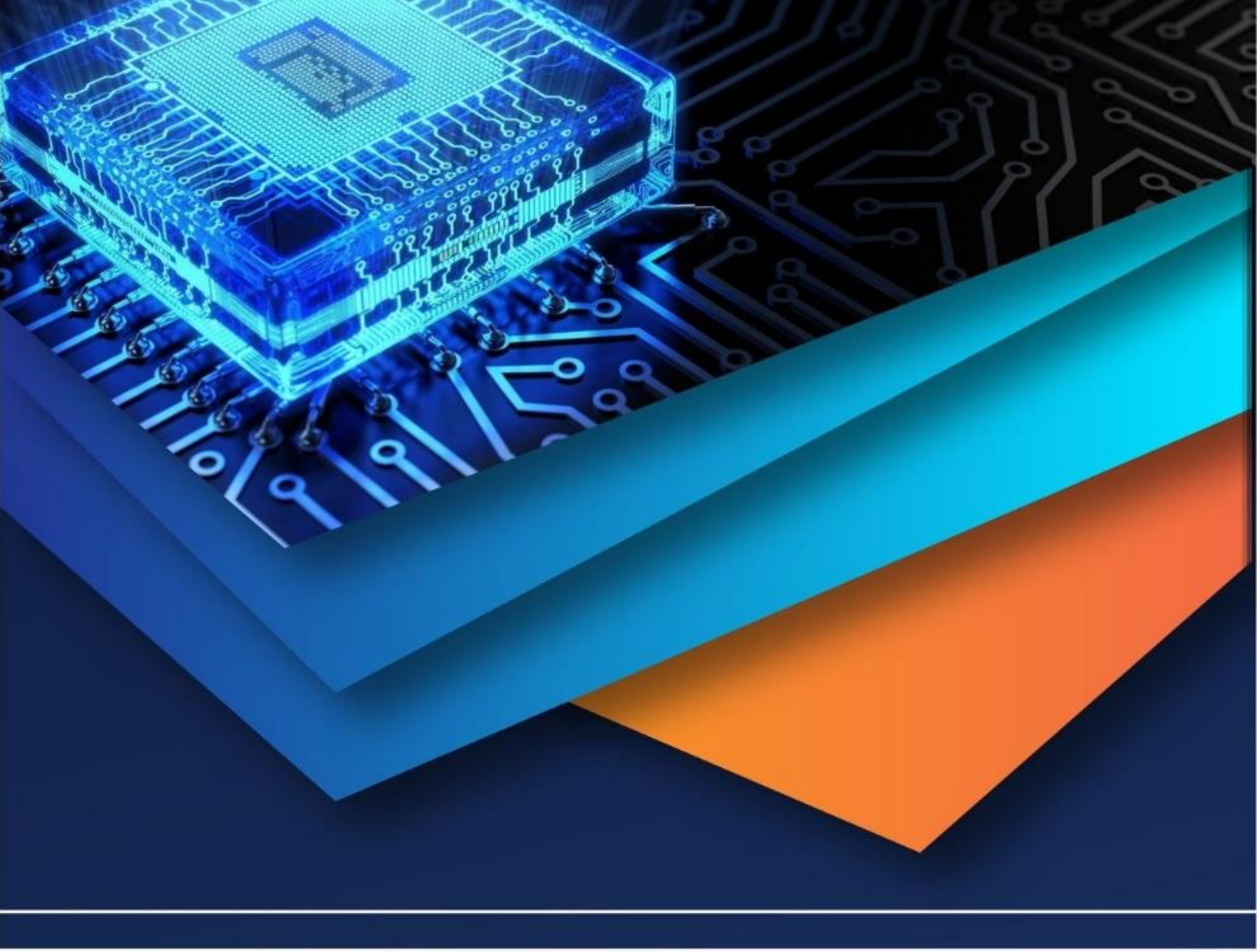
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