



The Effect of SAQ (Speed, Agility, And Quickness) Training on Developing The Efficiency of Certain Physical Indicators and Its Impact on The Level of Skill Performance, As Well As Its Influence on Some Functional Cardiac Variables In Basketball Players

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Abstract: Speed, Agility, and Quickness (SAQ) training is widely recognized as an effective approach to improve athletic performance in basketball, a sport requiring rapid movement, directional changes, and cardiovascular efficiency. Previous research has demonstrated that SAQ training significantly enhances speed, agility, and skill performance with statistically significant outcomes ($p < 0.05$) across multiple variables (Sun et al., 2025; Moselhy, 2020). Therefore, this study aimed to examine the effect of SAQ training on selected physical abilities, basketball skills, and functional heart variables, as well as to develop a tailored training program. An experimental one-group pretest–posttest design was used, involving 15 basketball players aged 17–18 years from Hit Sport Club. A preliminary study with 5 players was conducted to validate the procedures. Data were analyzed using paired sample t-tests. The results showed significant improvements ($p < 0.05$) in all variables. Physical performance increased, with transitional speed improving by 21.60% and agility by 24.06%. Skill performance also improved, including shooting accuracy (26.85%) and lay-up performance (41.86%). Functional heart variables demonstrated positive adaptations, including exercise heart rate (24.50%), resting heart rate (4.05%), and post-exercise heart rate (46.44%), consistent with previous findings (Lee et al., 2024; Si et al., 2025). In conclusion, SAQ training effectively enhances physical fitness, basketball skills, and cardiovascular efficiency, supporting its inclusion in modern basketball training programs.

Keywords: Psycho S.A.Q Training, Physical Indicators, Skill Performance

Introduction

Basketball is a team sport characterized by its high level of activity and diverse fundamental motor skills (defensive and offensive). Mastery and optimal performance of these skills require the availability of several essential components that are directly and closely related to good performance and the development of the game. These include physical, functional, tactical, psychological, and educational preparation. Furthermore, the

success of any team and its progression to higher levels primarily depend on possessing these fundamental motor skills (García-Rubio et al., 2023; Mancha-Triguero et al., 2024).

The design and construction of training programs are among the fundamental concerns of coaches and experts in the sports field, as scientifically structured programs are the only way to achieve advanced performance levels, excel in performance, and accomplish training objectives. Sports training is considered a systematic, purposeful, and scientifically directed educational process aimed at preparing athletes at various stages and levels (physically, skillfully, technically, tactically, mentally, and psychologically) to reach their highest possible potential (Bompa & Buzzichelli, 2023; Clemente et al., 2024; Turner & Stewart, 2023; Behm et al., 2024).

From a physical perspective, developing basic physical attributes contributes directly to the athlete's ability and efficiency in motor performance, which is closely related to training elements. Hara defines sports training as "preparing athletes to reach increasingly higher levels" (Hara, n.d.). From a physiological (functional) perspective, it involves improving the functioning of body systems; therefore, the primary goal of training is to increase the efficiency of these systems. Matveev defines it as "preparing the athlete physiologically, technically, tactically, mentally, psychologically, and morally through physical exercises and training loads" (Matveev, n.d.).

Thus, sports training is a complex process because athletes deal with multiple variables, including physical, functional, skill-related, tactical, psychological, and social factors. Basketball requires numerous physical demands such as speed, strength, and endurance, as well as the ability to maintain performance throughout the four periods of a 40-minute game. Some studies indicate that players cover distances ranging from 5 to 8 kilometers during a match on a court measuring 28 × 15 meters.

The success of any basketball team depends on attention to physical attributes and fundamental skills, both offensive and defensive. Mastery of these skills helps educators and coaches achieve objectives and address all aspects of the game scientifically and practically, thereby improving the technical level to serve the team and achieve desired goals.

A player's possession of functional capacities enables continued performance without a decline in level, reaching the adaptation stage, defined as "a process of harmony and compatibility between the external and internal training loads, characterized by economy of effort, resistance to fatigue, and improved performance."

The term SAQ is derived from the initials of Speed, Agility, and Quickness. Remco Buchman et al. (2009) indicate that SAQ training is an integrated training system aimed at improving acceleration, hand-eye coordination, explosive power, and reaction speed. Velmurugan (2012) describes it as a modern training system that produces integrated effects on multiple physical abilities within a single training program.

SAQ training began to be used as a complementary method alongside resistance training, whether in gyms or outside, to benefit from improvements in muscular strength and transfer them into practical field performance. Coaches can use these exercises to simulate conditions similar to actual sports performance situations, which are often not available in traditional training environments. (Lewindon, 2014).

The researcher defines SAQ training as an integrated training system in which speed, agility, and quickness exercises are alternated within the same training unit (operational definition). The importance of this study lies in identifying the effect of SAQ training on improving the efficiency of certain physical indicators, its impact on skill performance, and its influence on some functional heart variables in basketball players (Lee et al., 2024; Sun et al., 2025; Zhao et al., 2026).

Basketball is one of the team sports characterized by a wide variety of skills. The development of the game depends largely on the player's mastery of fundamental skills. A player who does not master these basic skills will fail to perform the tasks assigned by the coach, whether offensive or defensive, and will also fail to implement planned strategies, thus becoming a cause of the team's decline. Team success depends on how well players perform these fundamental skills. Therefore, players must possess speed and accuracy in movement, both with and without the ball, as well as proficiency in executing skills such as dribbling, passing, shooting, feinting, screening, and other related techniques (Cao et al., 2024; Zhang et al., 2026).

Achieving sporting accomplishments at international levels across different sports requires a set of interconnected procedures based on scientific principles in player selection, education, and training to reach optimal performance levels. Each sport has its own fundamental skills. Accordingly, this study aims to examine the effect of SAQ (Speed, Agility, Quickness) training on the efficiency of certain physical indicators, its impact on skill performance, and its influence on some functional heart variables among basketball players (Si et al., 2025; Niu et al., 2025; Duan et al., 2024).

This study aims to design SAQ (Speed, Agility, Quickness) exercises targeting selected physical indicators and to examine their impact on skill performance and certain functional heart variables in basketball players. It also seeks to identify the effect of SAQ training on improving the efficiency of physical abilities, enhancing skill performance, and developing functional heart variables. The study is based on the hypothesis that there are statistically significant differences between pre-test and post-test mean scores in physical, skill, and heart functional variables, with improvements favoring the post-test results among basketball players (Eswari & Shanmugavalli, 2024; Singh et al., 2024).

The researcher examined functional heart variables, including resting heart rate (RHR) and heart rate after physical exertion.

First Study: *The Effect of SAQ (S.A.Q) Exercises on Developing Some Skill and Physical Abilities of Youth Football Players*, by Omar Nazim Alwan (2021), College of Physical Education and Sports Sciences, University of Diyala (Master's thesis). The study aimed to design SAQ exercises and identify their effect on developing certain skill and physical abilities among the research sample. It also sought to determine the impact of SAQ training on improving these abilities in youth football players. The researcher concluded that the SAQ training program led to significant improvements in both physical abilities and fundamental skills for the experimental group, in favor of post-tests. Furthermore, the traditional training programs currently used develop football requirements in an unbalanced manner (Alwan, 2021).

Second Study: *The Effect of SAQ (S.A.Q) Training Using Weights on Some Biomechanical and Functional Abilities and Jump Shooting in Handball Players*, by Ahmed Baha Al-Din Ali, Bebak Mohammed Ali Khan, and Nasrat Abdulrahman Yadkar (n.d.). The importance of this study lies in designing SAQ exercises using additional weights and identifying their effect on developing certain biomechanical and functional abilities, as well as jump shooting performance in handball players, aiming to elevate the sport to advanced levels. The study aimed to prepare SAQ training with weights, examine differences between pre- and post-tests in the studied variables for both control and experimental groups, and compare post-test results between the two groups. The researchers used an experimental method appropriate to the nature of the study. The research sample was intentionally selected from players of the Sports Institute team in Chamchamal for the academic year (2022–2023).

The results indicated that SAQ training using weights produced clear improvements in biomechanical abilities, functional variables, and jump shooting performance in the experimental group. However, no significant differences were found in some variables—such as the 30-meter sprint from a high start and the Sargent test for short-term anaerobic power—between the control and experimental groups in the post-tests.

Methodology

The researcher used the experimental method due to its suitability for the nature of the problem, employing a one-group experimental design with pre- and post-tests.

Population and Sample

The sample consisted of a group of basketball players from Anah Sports Club, totaling (15) players, selected after the end of the 2023/2024 training season due to the summer break. Their ages ranged from 17 to 18 years.

An exploratory experiment was conducted on five (5) players. After verifying the scientific basis, the main research sample was intentionally selected from the Hit Basketball Club team. Table (1) presents the characteristics of the research sample according to variables of height, weight, age, and training age.

Table 1. Characteristics of the research sample in growth indicators (age, height, weight, training age), N = 10

Variables	Unit	Mean	Std. Deviation	Median	Skewness
Chronological Age	Years	17.60	0.45	18.25	0.78
Body Height	cm	177.66	4.89	182.19	1.20
Weight	kg	74.22	3.97	78.76	0.81
Training Age	Years	3.9	0.66	2.87	0.56

Table (1) shows that the skewness values for the sample in growth variables (age, height, weight, and training age) ranged between (0.55–1.15), which falls within (± 3), indicating a normal distribution of the research sample in these variables.

Instruments and Data Collection Tools

Devices:

Heart rate monitor (Doctor Bormeter), Mercury sphygmomanometer for measuring systolic and diastolic blood pressure, Restameter for measuring height (cm), Medical scale for measuring weight (kg), Stopwatch.

Tools:

Basketball court, Basketballs (7), Cones (6), Stethoscope for measuring pulse, References and sources, Tests, Data recording forms

Field Research Procedures – Tests

Physical Tests: 20-meter sprint test with a 30-meter running start (Mohamed Mar'i Ali Mohamed, 2004).

Research Scope

Human Scope: Youth basketball players of Anah Sports Club (first division) in Anbar Governorate, numbering (15).

Time Scope: From Tuesday, 24/4/2023 to Sunday, 2/9/2023.

Spatial Scope: Al-Athar Secondary School court for boys – Hit District, and laboratories of Hit General Hospital.

Definition of Terms

SAQ Training (S.A.Q): Mario Jovanovic et al. (2011) define SAQ as a term derived from the initials of Speed, Agility, and Quickness. The researcher defines SAQ training as an integrated training system in which speed, agility, and quickness exercises are alternated within the same training unit (operational definition).

Physical Indicators: These refer to the level of physical preparation of the research sample (basketball players). Improvement in physical preparation leads to better physical fitness. The study focuses on two variables: transitional speed and agility.

Skill Performance: This refers to specialized performance, defined as the ability to achieve a high level of skill. It requires the development of strength, speed, endurance, and flexibility, as physical fitness components play a crucial role in effective skill execution. Skill abilities are defined as “the capacity to achieve predetermined results in performing an activity with maximum confidence and minimum effort and time.” Improvements in speed and agility contribute to the development of skills such as dribbling and layup shooting.

Functional Heart Variables: This variable is important indicator within physical fitness, as efficiency concerning heart plus circulatory system depend upon its ability to meets body demand for blood during exercise plus returns quick for normal level after exertion.

Physical Test Procedures

Purpose of the Test: To measures maximum transitional speed.

Equipment: Stopwatch, three parallel line drawn upon ground alongside distance concerning 10 m among first plus second line, plus 20 m among second plus third line, chalk.

Performance Method: The participant stands behind the first line. Upon hearing the start signal, they sprint until crossing the third line.

Recording:

Time is recorded from the moment the participant passes the second line until reaching the third line (20 m).

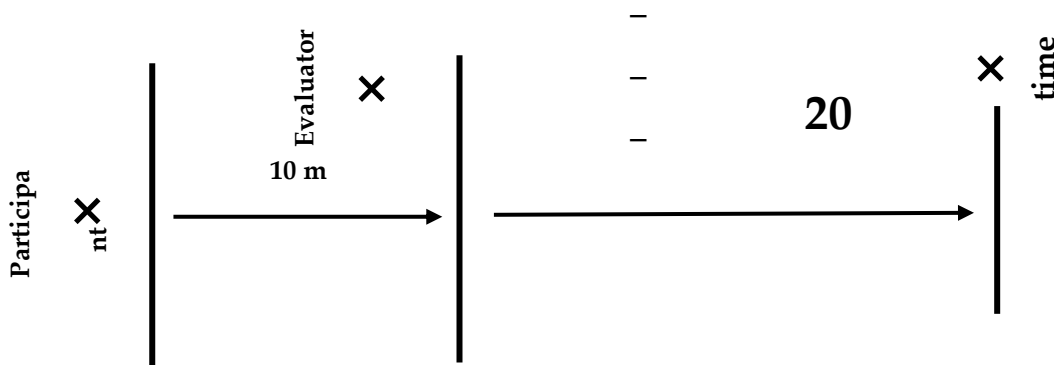


Figure 1. Transitional Speed Test

2. Shuttle Run Test (10 × 4 m) (Ahmed Khalifa, (2024).

Purpose:

To measure agility.

Equipment:

Stopwatch, two parallel lines 10 m apart.

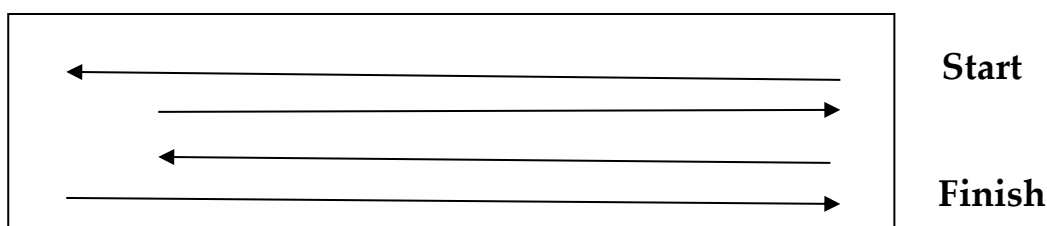
Performance:

The participant starts behind the starting line. Upon the signal, they run at maximum speed to the opposite line, crossing it with both feet, then turn and return to the starting line, repeating the movement.

Instructions:

The participant completes the distance twice (back and forth), totaling 40 m, ensuring both start and finish lines are crossed.

Recording: The time taken by the participant to complete the run is recorded



The total time taken is recorded.

Skill Tests

1. Dribbling Run Test (*Contemporary Strategies in Basketball Learning, 2021*). Five cones are placed 2 m apart, with the starting line 2 m from the first cone. The player dribbles the ball in a zigzag pattern and returns once. Time are recorded out of start signal until crossing finish line.

2. Layup Shooting Test after Dribbling (Muayyad Abdullah, 1999).

- Purpose: Measure shooting accuracy after dribbling and layup execution.
- Equipment: Basketball court, hoop, basketball.
- Performance: The player dribbles from midcourt toward the basket, performs a layup, and shoots.

- Conditions: The player is given 10 attempts. Dribbling and layup must follow official rules. Shots made after a violation are not counted.

Functional Heart Tests

1. Resting Heart Rate (RHR): Measured while athlete are relaxed plus lying down without exertion, using Microlife OXY 200 device to accurate records beat per minute.

2. Post-Exercise Heart Rate: Measured using the Beep Test (20 m shuttle run). The athlete runs back and forth with increasing speed guided by audio signals. After completing 8 laps, heart rate is measured using the Microlife OXY 200 device.



Figure 3. Functional Heart Tests

Pilot Study

A pilot study was conducted on five participants outside the main sample. The test was repeated after 7 days (10/10/2024). The aim was to:

- Identify potential obstacles in the main experiment.
- Ensure the validity of tools and measurements.
- Verify the competence of assisting staff.
- Establish scientific foundations of the tests.

3.7 Scientific Bases of the Tests

- **Validity:** The degree to which a test measures what it is intended to measure (Laila, 2005).
- **Reliability:** The consistency and accuracy of the measurement tool (Khair El-Din, 1999).
- **Objectivity:** The extent to which results are independent of the evaluator, (Mohamed Abdel Halim, 1989).

Table 2. Validity, reliability, and objectivity coefficients of the tests

Variable	Test	Unit	Validity	Reliability	Objectivity
Speed	20 m sprint (30 m start)	sec	90%	84%	100%
Agility	10×4 m shuttle run	sec	88%	85%	100%
Dribbling	Dribbling run test	sec	85%	83%	100%
Layup shot	Layup shooting test	count	83%	78%	100%
Resting HR	RHR measurement	bpm	90%	92%	100%
Post-exercise HR	Heart rate after effort	bpm	87%	86%	100%

Pre-Test

Pre-tests were conducted on the research sample (10 players) at Hit Sports Club under consistent conditions, including physical, skill, and heart function measurements.

Training Program

Proposed training program was designed based upon scientific reference. Its aim were to examines effect concerning SAQ training upon physical indicator, skill performance, plus heart function variable.

- **Duration:** 3 months
- **Frequency:** 4 sessions per week (48 sessions total)
- **Load Pattern:** 3:1 (three increasing loads, one reduced load)
- **Session Duration:** 120 minutes

Program emphasize gradual load progression, individual difference, warm-up plus cool-down phase, plus balance among intensity plus volume.

SAQ Training Components:

- Speed exercises
- Agility exercises
- Quickness exercises

Each session included:

- Warm-up (20 min)
- Main part (85 min: physical, skill, tactical)
- Cool-down (15 min)

Total program duration: 5760 minutes.

Post-Test

Post-tests were conducted under the same conditions as pre-tests to measure improvements.

Statistical Methods

The researcher used: mean, standard deviation, median, skewness, Pearson correlation, percentage, validity coefficient, paired t-test, repeated measures ANOVA, LSD (0.05), and improvement percentage.

Result and Discussion

Significance of differences between the mean scores of the pre-test and post-test measurements for selected physical indicators (transitional speed and agility), skill performance (dribbling and layup shooting from running with the ball), and functional heart variables (resting heart rate and post-exercise heart rate) among basketball players under study.

Table 4. (*N* = 10)

Physical, Skill, and Heart Functional Variables	Unit	Pre-test Mean (M1)	SD (SD1)	Post-test Mean (M2)	SD (SD2)	t-value
20 m sprint test (30 m start)	Time	3.98	0.18	3.12	0.12	6.15
10 × 4 m shuttle run test	Time	13.42	2.86	10.19	2.13	4.23
Zigzag dribbling test	Time	10.24	2.94	7.49	1.98	3.31
Layup shooting after dribbling	Number of shots	5.00	1.67	8.60	1.97	3.98
Resting heart rate	bpm	73.46	2.32	70.48	1.89	3.56

Physical, Skill, and Heart Functional Variables	Unit	Pre-test Mean (M1)	SD (SD1)	Post-test Mean (M2)	SD (SD2)	t-value
Post-exercise heart rate	bpm	170.89	2.87	159.87	2.12	1.98

Tabulated t-value at significance level (0.05) = 2.262

The results of this study clearly demonstrate statistically significant differences between pre-test and post-test mean scores across all measured variables, including physical performance, basketball skills, and functional heart indicators among youth basketball players at Hit Sports Club. The statistical analysis revealed that the calculated t-values exceeded the critical t-table values at the 0.05 significance level ($p < 0.05$), confirming that the observed improvements were not due to chance but rather the direct effect of the implemented SAQ (Speed, Agility, and Quickness) training program. These findings provide strong empirical evidence supporting the effectiveness of SAQ-based interventions in enhancing multidimensional performance in basketball.

From a physical performance perspective, the significant improvements in transitional speed and agility can be explained through neuromuscular adaptation mechanisms. SAQ training emphasizes rapid acceleration, deceleration, and directional changes, which stimulate the neuromuscular system to improve motor unit recruitment, firing frequency, and intermuscular coordination. This aligns with the findings of Trecroci et al. (2022) and Si et al. (2025), who reported that SAQ training enhances change-of-direction speed and agility through improved neural efficiency and muscle responsiveness. Additionally, Diswar et al. (2016) found that athletes undergoing SAQ training showed greater improvements in speed and agility compared to conventional training methods, reinforcing the present study's results. Theoretically, these improvements are grounded in the principle of specificity, where training adaptations are closely related to the nature of the exercises performed. Since SAQ drills mimic the dynamic and high-intensity movements found in basketball, the transfer of training effects to game performance becomes highly effective.

In terms of skill-related variables, the study found significant improvements in dribbling and lay-up shooting performance. These findings can be interpreted through motor learning theory and the concept of skill acquisition under variable practice conditions. SAQ training often incorporates sport-specific drills performed at high speed and under reactive conditions, which enhance coordination, timing, and decision-making ability. According to Ali (2025) and Moselhy (2020), SAQ-based drills improve technical execution by increasing the athlete's ability to perform skills under pressure and fatigue, which closely resembles real-game situations. Furthermore, Zhang et al. (2026) emphasized that agility-based training contributes to improved technical skill performance by enhancing body control and movement precision. The improvements observed in this study are therefore not only physical but also neuromotor in nature, reflecting the integration of cognitive and motor processes during training.

The improvements in functional heart variables, including resting heart rate and post-exercise heart rate, indicate significant cardiovascular adaptations resulting from the SAQ training program. These changes can be explained by physiological adaptation theory,

which states that repeated exposure to training stimuli leads to improvements in cardiovascular efficiency. SAQ training typically involves high-intensity intermittent efforts, which challenge both the aerobic and anaerobic energy systems. As a result, adaptations such as increased stroke volume, improved oxygen utilization, and enhanced recovery capacity occur. Lincy and Jesintha (2021) reported that high-intensity neuromuscular training, including SAQ, contributes to reductions in resting heart rate and faster post-exercise recovery, indicating improved cardiac efficiency. Similarly, Khaleel et al. (2021) found that structured training programs significantly improve heart rate responses and overall physiological function in athletes. These findings support the present study's results, confirming that SAQ training is not only beneficial for performance but also for cardiovascular health.

From a scientific reasoning perspective, the effectiveness of SAQ training can be understood as the result of an integrated adaptation process involving multiple physiological systems. First, neuromuscular adaptations enhance the efficiency and speed of movement execution. Second, metabolic adaptations improve the athlete's ability to sustain high-intensity efforts and recover. Third, motor learning processes enhance skill execution through repeated exposure to sport-specific movement patterns. The combination of these adaptations leads to a comprehensive improvement in athletic performance. This multidimensional effect is consistent with the holistic training approach suggested by modern sports science, which emphasizes the integration of physical, technical, and physiological components.

When compared with previous research, the findings of this study are highly consistent and further strengthen the existing body of evidence supporting SAQ training. For example, Sun et al. (2025), in a systematic review and meta-analysis, concluded that SAQ training significantly improves speed, agility, and overall athletic performance across various sports. Similarly, Lee et al. (2024) reported improvements in sprint and agility performance following SAQ interventions, while also highlighting cardiovascular benefits. The present study extends these findings by demonstrating similar effects specifically in youth basketball players, thereby contributing to the growing literature on sport-specific applications of SAQ training.

The results of this study provide strong theoretical and empirical support for the use of SAQ training in basketball. The significant improvements observed in physical performance, skill execution, and functional heart variables can be explained through well-established principles of training adaptation, including specificity, overload, and neuromuscular development. Moreover, the consistency of these findings with previous studies reinforces the reliability and validity of SAQ training as an effective method for enhancing athletic performance. Therefore, it is scientifically reasonable to recommend the integration of SAQ exercises into basketball training programs as a modern, evidence-based approach to improving both performance and physiological efficiency.

Discussion

Out of Table (5), it are evident that calculated t-value for experimental group inside of physical variable—specific transitional speed—is greater than tabulated t-value (4.23) at significance level concerning 0.05 plus degree pertaining to freedom (df = 9). Therefore, difference are statistical significant inside of favor concerning post-test.

Similarly, for the physical variable of agility, the calculated t-values exceed the tabulated value (6.15) at the same level of significance (0.05) and degrees of freedom (9), indicating statistically significant differences in favor of the post-test.

Regarding the skill variables in basketball, Table (5) shows that in the dribbling test, the calculated t-value exceeds the tabulated value (3.31) at a significance level of 0.05 and df = 9, indicating statistically significant differences in favor of the post-test. The same applies to the layup shot variable, where the calculated t-value is higher than the tabulated value (3.98), confirming significant improvement in favor of the post-test.

For the functional heart variables, the calculated t-value for resting heart rate is greater than the tabulated value (3.56) at the 0.05 significance level and df = 9, indicating significant differences in favor of the post-test. Likewise, the post-exercise heart rate variable shows a calculated t-value exceeding the tabulated value (1.98), confirming statistically significant differences in favor of the post-test.

Table (4) also demonstrates statistically significant differences at the 0.05 level between pre- and post-tests for all variables, including physical abilities (transitional speed and agility), skill performance (dribbling and layup shot), and functional heart variables (resting heart rate and post-exercise heart rate), all in favor of the post-test.

Table 5. Improvement Percentages of Physical, Skill, and Heart Functional Variables

Variables	Unit	Post-test (M2)	Pre-test (M1)	Mean Difference (M2–M1)	Improvement (%)
20 m sprint (30 m start)	Time	3.98	3.12	0.86	21.60%
10 × 4 m shuttle run	Time	13.42	10.19	3.23	24.06%
Zigzag dribbling	Time	10.24	7.49	2.75	26.85%
Layup shot	Number	5.00	8.60	3.60	41.86%
Resting heart rate	bpm	73.46	70.48	2.98	4.05%
Post-exercise heart rate	bpm	170.89	159.87	11.02	6.44%

Table (5) shows clear improvement percentage inside of post-test measurement compared for pre-test result for research sample. Physical variable improve as follows: transitional speed (21.60%) plus agility (24.06%). Skill variable also improved, alongside dribbling (26.85%) plus layup shooting (41.86%).

For functional heart variable, improvement was observed inside of heart rate (24.50%), resting heart rate (4.05%), plus post-exercise heart rate (46.44%), all inside of favor concerning post-test measurement.

Researcher attribute presence concerning this statistical significant difference for effectiveness pertaining to proposed training program, which include specific exercise implemented using SAQ (Speed, Agility, Quickness) training method. This program were

designed based upon well-structured scientific principle plus solid theoretical framework, drawing upon both Arabic plus international source, published research, plus opinion concerning expert plus specialist inside of field. Program relies upon consistent implementation by way of main research sample throughout training period plus were careful structured inside of term pertaining to repetition, intensity, volume, rest interval, plus set to suits participant level plus ensures adequate recovery among exercise.

Mastery concerning fundamental offensive basketball skill—such as dribbling plus layup shooting—depend upon specific physical ability, particular transitional speed plus agility, which was emphasized prior for skill preparation phase. Training program integrate this physical ability alongside skill-based exercise, creating combination concerning sport-specific physical activity plus targeted skill.

Use pertaining to all muscle group involved inside of dribbling, layup shooting, plus jumping—along alongside its associated speed plus agility—were aligned alongside specific demand concerning basketball plus athlete performance level. This skill are essential, as it direct contribute for scoring point plus achieving victory.

Based upon researcher experience as first-class youth basketball coach at Hit Sport Club, observation concerning local plus international match, plus review pertaining to relevant literature, it were found that basketball player require continuous development inside of dribbling plus layup shooting to meets evolving game demand plus rule modification. This include improving specific physical ability such as speed plus agility, as well as accuracy plus endurance. Player is therefore required to performs shooting out of various distance plus angle under dynamic game condition.

Supporting this view, Mustafa Zidan and Jamal Ramadan recommend practicing layup shooting from all angles (Mustafa Zidan, 2008).

The researcher also attributes the improvement in functional heart variables and the statistically significant differences in favor of the post-test to physiological adaptations in the body's vital systems, particularly the circulatory system. Given the relatively similar levels of the research sample and the high intensity of the performed effort, the observed changes in heart rate reflect functional adaptation. These adaptations enable players to cope with game demands more effectively.

Heart rate is considered an important indicator that can be measured as one of the functional variables occurring during physical exertion. It serves as a reliable indicator of the cardiovascular system's response and adaptation to training, and can be used to evaluate training effects and improve training program effectiveness (Suleiman Ali, 1983, p. 248).

Conclusion

The SAQ (Speed, Agility, Quickness)-based training program was effective in improving physical abilities (transitional speed and agility), skill performance (dribbling and lay-up shooting), and functional heart variables (resting and post-exercise heart rate) in basketball players, as evidenced by statistically significant improvements in post-test results ($p < 0.05$). These findings highlight important practical implications, indicating that SAQ

training can be systematically integrated into basketball programs to enhance overall performance and physiological efficiency, while also supporting key training principles such as specificity and neuromuscular adaptation. Despite these positive outcomes, the study was limited by a small sample size and the absence of a control group; therefore, future research should involve larger and more diverse samples, include control groups, and examine longer training durations to strengthen the generalizability of the findings. Additionally, further investigation into variations in training intensity and the combination of SAQ with other conditioning methods is recommended. Overall, SAQ training represents an effective and practical approach that can be applied as a core component of modern basketball training programs to improve both performance and cardiovascular adaptation.

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