

Effect of meditative thinking on kinematic aspects of the tennis serve

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ABSTRACT

The purpose of this study was to measure how much rookie players were thinking meditatively while mastering the serve technique, identifying the values of kinetic transmission and streamline for their performance of this skill as well as the connection, contribution, and influence of meditative thought on kinetic transmission and streamline when they perform the serve skill in tennis. This study employed a descriptive correlational design on a sample of 15 young tennis players who were specifically chosen to represent the entire target group. These players were selected from the Tennis Academy in Baghdad for the sport season 2018-2019. The Eysenck & Wilson Reflectiveness Scale was used after its translation into Arabic language. Each player's performance for serve skill was used to measure the transmission of momentum between body parts and the kinetic streamline using the Dart fish–Team Pro 5 full version. Data were analyzed using the statistical package for social science (SPSS) for windows, version 25. The study results revealed that young players who have a high level of meditative thinking can control and master transmission of momentum between body parts with a streamline that reflects an improved performance for the serve skill in tennis. It is necessary to pay attention to support the meditative thinking in the teaching sessions for the young beginners in tennis and employing the kinetic activities to achieve the required model in performance. Furthermore, it is necessary to support the coaches in how to measure the meditative thinking and its improving to go parallel to improve the skillful performance in tennis to make players realize the local and international professionalism.

KEYWORDS

Meditative Thinking; Specialized Kinematic Aspects; Serve Skill; Tennis

1. INTRODUCTION

The facts of the various results of studies have proven the existence of a relationship of human movements with thinking processes. Thus, they provide an explanation of the accuracy of controlling their movements on philosophical grounds in that accessing them depends on thinking processes given that mental processes are owned by all healthy people, but the skills of the mind and thinking processes are what enables the athlete and distinguishes him/her from others in control over each position of the body parts. This can be done by controlling the number of stimuli required to control each and every part. Thereafter, linking consistently shows aesthetic performance or its absence from errors. Hussein notes that "determining the mechanical principles and foundations associated with skillful performance is the first step in revealing the causes of performance errors. Mechanical principles and foundations may differ according to skillful performance. That is, although there are general principles and foundations that represent the mechanical framework that governs human performance in general, however, with different performance patterns, these principles may differ in terms of quantity and quality (Husameldeen, 2004).

Hoffmann notes that "the process of kinematics is by the athlete's ability to coordinate the partial movements of his body with each other in place and time, and the movement and performance of this consistency when facing the competitor or using the tool" (Hoffmann, 2012). Abdul-Lateef emphasizes that, "We can emphasize that the main field of biomechanics is researching the rules, conditions, and technical origins of various motor skills in an objective way. There is no doubt that the objective study of motor skill contributes to laying the foundations for the best, most appropriate, and possible skillful performance. This can be achieved by expanding the theoretical information base on the various types of sports activities in order to be able to innovate and achieve the best possible movement achievement" (Abdul-Lateef, 2003).

Learning the skillful performance of the serve in tennis depends on kinetic transmission and streamline in skill movements. Abdul-Qadir classifies the kinetic transmission among the body parts into two types; the first is the kinetic transmission from the trunk to the limbs, where the movement in this type begins from trunk to one of the limbs, arms, legs, or head. The second type is the kinetic transmission from the limbs to the trunk because the nature of the human body makes it imperative that the limbs are the source of the internal force causing the transitional body movement. So, in most movements, the dependence is on the limbs as a source of the motive force or as an auxiliary force. Furthermore, the kinetic transmission from the limbs to the trunk sounds clearly in most of the sports movements. It also can be classified as kinematic movement from the arms to the trunk, the

kinematic movement from the legs to the trunk, and the kinetic movement from the head to the trunk" (Abdul-Qader, 2014).

Kinematic streamline is also known as those related movements that are graduated in our bodies, which is the integration of all the vertebrae as if they were a single piece; it is the interrelated relationship to reflect the form of movement according to its stages and harmony. The equal movement is that be consistent and graceful with the surrounding so that be performed beautifully without the effects of the surrounding. Balancing the exerted force and regulating the nervous system signals for the kinematic work with movement weight gives an arc-kinematic path rather intermittent. For this reason, streamlining in the kinematics is considered reflecting for the complete art of skill, which is a visible kinetic attribute that works to encourage observation by watching it. The streamlining is also the lack of time periods between the movement's sections and one skill and another. The streamlining means the integration in the kinetic performance and the highest level the athlete reaches" (Ibrahim, 2000). Abdul-Karim expresses his opinion, "The change in momentum can be measured by the stability of the athlete's mass and the change of his/her speed, whether or not, to indicate the streamlining of movement still being measured descriptively (Qualitatively). Therefore, it can be said that the movement streamlining equals the change in momentum, given that the push of good strength means good streamlining according to Newton's second law. This law has been applied in applied scientific research inside Iraq (Mashkooor & Hameed, 2022). It is not possible to ignore how the muscles are triggered by the appearance of these kinetic features, which are thinking, especially meditative.

Al-Zghool and Al-Zghool (2003) define thinking as "a series of mental activities that the brain performs when it is exposed to a stimulus that is received by one of the five or more senses, which is an abstract concept that involves invisible and intangible activities. What we observe or perceive are the results of the act of thinking, whether written or spoken, kinetic or visual" (Al-Zghool & Al-Zghool, 2003).

Al-Khazindar and others defined it as a "mental, cognitive, dynamic, and purposeful process serves to reorganize what we know of symbols, concepts, and perceptions into new patterns used in decision-making, problem-solving, and an external reality understanding" (Al-Khazandar et al., 2006). Beedis mentions, "Reflective means Re-flex, meaning re-flipping and twist, that is to returning something to restore and scrutinize events" (Beedis, 2004). Rodgers states that "meditation is considered as a vital component of self-regulation of individuals' movements" (Rodgers, 2002).

George states that "Dewey sees that the mental actions used in problems-solving put the mind in a meditative situation to reach a solution to the contradiction in the problem, between an existing reality and a reality to be achieved.

The solution to the contradiction is more of cognitive work, its regulation and sequence, in order to find a harmonious continuous line between the goal and the way that conduce to it. Reflexive thinking is considered as a scientific thinking in its essence" (George, 2000).

Mahdi and Abdul-Kareem (2013) mentioned with Abda state that "the importance of meditation lays in helping learners in linking new information with previous understanding, thinking about abstract and tangible concepts, understanding their own thinking and learning strategies, applying new strategies in unprecedented new situations and tasks, and analyzing various subjects and their evaluation, communication all its types, and developing self-feeling and psychological awareness, Meditative thinking includes analysis and decision-making. The meditative plans, monitors always, and assesses his/her method of operations and the steps he/she takes to make judgments, diversification in teaching methods and dealing in the classroom (Mahdi & Abdul-Kareem, 2013; Alardah, 2008).

Al-Thaqafi and others see "The practice of meditative thinking makes the individual possesses a set of characteristics and traits that appear in his/her behavior later. These characteristics include reducing impulsivity, listening to others with their understanding, emotional and emotional reincarnation, and flexibility in thinking, checking, and controlling" (Al-Thaqafi et al., 2013).

Through the work of the researcher as an academic and coach in the game of tennis, he notes that young, beginner players enrolled in the tennis academy in Iraq are making physical efforts and various movements in order to reach the correct performance model in the serve. This scientific research aims this issue at according to the principle of economics in those efforts and achieving better results throughout their teaching.

Obviously, it is not possible to confirm with any method they think without applying to them psychometric measurement and videotaping of their movements in which they fit in line with the model required to perform the serve skill. Thus, the scientific facts are realized quantitatively and keeping abreast the personal judgments in speculating the relationships between the psychological and skillful factor, especially the kinematic features.

This study aims to (1) identify the level of meditative thinking among beginner players in learning the serve skill, to (2) identify the values of kinetic transmission and streamline for their performance of this skill, and to (3) identify the relationship, contribution, and influence of

meditative thinking in kinetic transmission and streamline when they perform the serve skill in tennis.

2. METHODS

2.1. Design and participants

This study used a descriptive correlational design, which is defined as "studies that are concerned with revealing the relationships between two or more variables to know the extent of correlation between them, that is, they are used to determine the degree of relationship between these variables" (Al-Jabiri, 2011). The study included a sample of 15 young tennis players, who were purposively selected from the Tennis Academy in Baghdad for the sport season 2018-2019. The selected sample represented 100.0% of the target population.

2.2. Measurements, Tests, and Procedures

The Eysenck and Wilson Reflectiveness Scale for meditative thinking was used after its translation into Arabic language. This scale is known as Extraversion – Introversion scale, which includes 30 items that measure meditative thinking (Ysenck & Wilson, 1976). The researchers used each player's performance for the serve skills, videotaping using Casio Exilim Pro camera, Japanese brand with different speeds (300, 600, 1200) picture per second. In the videotaping, the researcher used 300 pictures per second using three cameras with a stand that is provided with aquatic balance. Using the Dart fish-Team Pro 5 full edition, the measurements of the kinetic streamline and the transfer of momentum between body components were made.

2.3. Statistical analyses

The statistical package for social sciences (SPSS) was used to analyze the data. The mathematical mean, standard deviation (SD), linear regression, partial eta, standard error of estimate, F-test, and slope for the linear regression were the statistical measurements used.

3. RESULTS AND DISCUSSION

Table 1 presents the descriptive parameters of the study variables, Table 2 describes the correlation, regression, and contribution among study variables, Table 3 presents the F-test to

examine the quality of linear regression model matching, and Table 4 describes the values of estimating the constant and influence.

The study results reveal that the young players who perform the serve skill in tennis who have a high level of meditative thinking can perform this skill by the transmission of appropriate kinetic momentum with an acceptable streamlining. This is due to the thinking processes through which they mastered the control processes through their muscles in this performance by comparing them with the correct model of this performance. Such a thinking indicate that the meditation has an influential role in the transmission of momentum between the parts of the body and the kinetic streamlining. The higher the meditation thinking, the more values are required for optimal performance.

Table 1. Descriptive parameters of the study variables

Variables	Unit	n	Mean	SD	Skewness
Meditative thinking	Degree	15	23.67	1.589	-0.598
Kinetic transmission among body parts	Kg/m/sec	15	239.73	9.699	0.62
Kinetic streamline in reference to the change in momentum	Kg/m/sec	15	183.952	15.114	1.158

Table 2. Correlation, regression, and contribution among study variables

Influencing variable	Influenced variable	R	R square	Adjusted R Square	R	Standard error of the estimation
Meditative thinking	Kinetic transmission among body parts	0.787	0.619	0.589		6.215
Meditative thinking	Kinetic streamline in reference to the change in momentum	0.745	0.556	0.522		10.455

Table 3. F-test to examine the quality of linear regression model matching

Influencing	Influenced	Variance	Sum of squares	df	Mean squares	F	P-value	Sig
Meditative thinking	Kinetic transmission among body parts	Regression	814.72	1	814.72	21.089	0.001	S
		Errors	502.213	13	38.632			
Meditative thinking	Kinetic streamline in reference to the change in momentum	Regression	1777.227	1	1777.227	16.26	0.001	S
		Errors	1420.91	13	109.301			

Table 4. Values of estimating the constant and influence

Influencing	Variables	β	Std. Error	t	P-value	Sig
Kinetic transmission among body parts	Constant	126.089	24.799	5.084	0.000	S
	Meditative thinking	4.802	1.046	4.592	0.001	S
Kinetic streamline in reference to the change in momentum	Constant	351.8	41.713	8.434	0.000	S
	Meditative thinking	-7.092	1.759	4.032	0.001	S

Knowles (2008) states that "the practice of meditation is the process by which we can generate self-awareness and highlight our practices or the practices of others with whom we work to form new knowledge or methods of work (Flayyih & Khiari, 2023). Therefore, the practice of meditation can be done individually or collectively in order to realize that we can learn from meditation with others, as it is during our self-reflection on our practices. In this context, many researchers have indicated that watching others during practice and discussing them in their practices and actions after their accomplishment creates opportunities for us to indirectly ask ourselves about our practices as well (SAEED et al., 2022).

Al-Majeed (2005) notes that "the aim of the meditation method is to reach control over the external stimuli in a way that enables them to reach the field of feeling clear and free from distortions, so that the person does not see them as a threat to him/her. Some studies have proven the

efficacy of this method for people with stress in the work field. So that we increase performance and make the worker more satisfied in his/her work, and he/she will be improved. Applying this method twice a day for 15 to 20 minutes each time by closing the eyes in the sitting position and meditation for 20 minutes. After opening the eyes for a period of about 15 minutes, a muscle contraction of the left hand is performed, as meditation exercises in movement lead to refocusing and noticing thoughts (Abass et al., 2022).

The effectiveness of this method can be increased by training to focus and paying attention to stimuli such as a visual focus on a fixed target, using one or two easy words that do not provoke emotions to focus attention, deeply breathing through the nose, and focusing on the inhalation and exhalation air. It is possible to use exercises that focus the mind on a fixed target in the competition situation for a period that allows the mind to calm, get rid of distracting negative thoughts, and the integration between relaxation and mental perception (Al-Majeed, 2005).

Al-Khawaldeh (2012) states that “meditative thinking emerges as an educational necessity through the benefits that its results in helping students to think deeply, explore new educational mechanisms, and meditation about multiple ideas on the topic, self-assess their work, and enhance students’ opinions by helping them solve problems, precisely analyzing matters. This serves to develop students’ psychological aspect. Tan and Goh believe that “meditation; as a process that requires the availability of time and experience factors, requires the practitioner to stop or pause, then note the learning situations. Meanwhile, useful knowledge is generated from the previous relevant experiences, which enables learners to give meaning for their learning processes” (Tan & Goh, 2008; Alwan, 2022).

Abdul-Wahab states that "as long as meditative thinking represents the hump of mental processes, education cannot ignore it and it becomes obligatory for educators to make efforts for its development. It makes the individual plan always and assesses his/her method in the processes and steps that he/she follows to make the appropriate decision" (Abdul-Wahab, 2005).

Meditative thinking depends on how to face problems and changing phenomena and events. The person who thinks about meditative thinking has the ability to perceive relationships, make abstracts, make use of information to support his/her point of view, analyze introductions, review and search for alternatives (Abdul-Wahab, 2005; Al-Mayyah, 2021).

Mahjoob (2001) states that “the kinetic characteristics, sensation, thinking, and visualization processes that differ from one learner to another and that flow into special methods differ from one performance to another. Certainly, the levels of motives and excitements differ from one person to another and from one condition to another. These individual factors need to be understood and

considered when setting programs". Shihata (1992) stresses that "superior skillful performance cannot be implemented in a distinctive manner unless it is subject to research and analysis in many ways in the light of the laws and biomechanics rules to reach best results". Jawad notes that "the nerve signals from the nervous system must be precisely directed in order for the movement to be performed in the required precision to hit the target" (Jawad, 2004.)

Al-Fadhli (2010) states that "to identify the distinctive characteristics of a skill and succession in the forms of movement that can be observed, potential errors and instructions given to the learner, it is necessary to be focused on directing attention to specific parts of the skill or specific parts of the body during performance". He states that "if the model is effective for the learner, the learner tries to reach this kinetic behavior by restoring the model and comparing it with his/her performance after each attempt" (Khayoon, 2002; Al-Mayyah & Jalal Obaid, 2021).

4. CONCLUSIONS

We obtained the following conclusions: 1. Young players who enjoy a high level of meditative thinking can master and control the transmission of momentum among body parts in a streaming manner. Thus, they would demonstrate an improved performance for the serve skill in tennis. 2. It is necessary to support the meditative thinking in the educational sessions for beginner tennis players and employing the kinetic activities to achieve the optimal performance model. 3. It is necessary to provide support for the coaches in terms of how to measure the meditative thinking and its improvement to go parallel to improve the skillful performance in tennis and enable players to realize the local and international professionalism.

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CONFLICTS OF INTEREST

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