Coordinative Abilities and Its Relationship with Performing Counterattack Variations in Junior Epee Fencers

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Abstract: The current research aims to identify coordinative abilities affecting the performance level of some counterattack variations and contribution percentages of coordinative abilities in the performance level of some counterattack variations (counterattack with retreat – counterattack on preparation – attack on attack) in junior epee fencers. The researcher used the descriptive approach. Research community included all junior epee fencers less than 20 years in Al-Qadeseia sports club. Participants (n=72) were purposefully chosen to represents five age groups (each group represents 2-3 years). In addition, another (20) fencers were recruited for the pilot sample. Results indicated statistically significant correlations between coordinative abilities and counterattack skills. Contribution percentages of coordinative abilities in counterattack skills were calculated.
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Key Words: Coordinative Abilities – Counterattack – Fencing

1. Research Problem and Significance:

Scientific research contributes in advancing sports activities. International levels in world and Olympic championships can show us the major advance and quick improvement of athletes, levels. This is reflected on all sports activities considering its physical, technical, tactical and psychological components.

Coordinative abilities play a major role in achieving elite performance and achievement according to its specific activity. Each sports activity has a group of coordinative abilities that distinguish it from other activities. Discovering these coordinative abilities for each sports activity, either according to the nature of activity or the age groups of participants, is a major research problem that faces sports specialists, especially in training and selection, as these abilities are very significant to develop a sports training program (Mekhaeil, F. 1998: 234).

Coordinative abilities differ from one sport to another and from one skill to another according to its requirements. These abilities are not individual but connected to other physical abilities related to type and requirements of performance (Hussam El-Din, T. (1997): 13).

Compared to other combat sports, fencing developed very quickly and took a prominent place among other games on the local, Arab and international levels, including Olympic games. This sport is characterized by fast tempo, changing distances and continuous maneuvers between attack and defense along the match. This requires specific coordinative abilities most of the time.

Coordinative abilities are closely related to improving technical motor skills. The specific sport identifies the specific coordinative abilities to be improved as the athlete can not master basic skills of his sport without these specific coordinative abilities (Abd El-Khalek, E. 2018: 188).

Coordinative abilities are basic pillars of sports skills as they for a common factor, combined of other factors, that helps reaching elite levels according to the athlete's physical abilities. Beginners with coordinative abilities perform better than others and can reach a high degree of general physical ability necessary for physical and technical fitness. Coordinative abilities are not related only to motor performance but also to complex skills with high level of difficulty and technical / tactical complexity (Ez, El-Din, H. & Ali, A. S. 1993: 136).

Coordinative abilities are general motor and psychological conditions for sports achievement through which the individual can control motor performance in all sports activities. They result from sports performance requirements as they are identified by the accuracy and mastery level of motor skills. Coordinative abilities are directly related to coordination as both affect each other. They are considered essential for sports activity in general. It represents athlete's ability to coordinate and link several motor tasks performed directly by him to other movements performed in relation with motor tasks of the opponent in a harmonious and purposeful unit. (Abd El-Khalek, E. 2018: 63) (Baleegh, H. 1996: 460) (Mostafa, A. 1998: 11).

Fencing requires specific abilities including physical, physiological, technical and psychological abilities proportionate, to a great degree, with requirements of technical attack performance. The fencer's performance depends on his ability to control distance, tempo and timing to technically perform effectively under changing conditions of training and competition at the presence of a positive opponent. This requires variation in movements and skills that basically depend on coordinative skills.

Combat between two fencers depends on the fencer's quick response to game situations to initiate proper attack and defense under these situations. If the fencer is to excel, he should have speed (motor response speed) and accuracy (touch accuracy) (Abd El-Aziz, I. 1999: 39).

Fencing specialists see it as training for body and mind. Motor abilities required by a fencer in competition can be divided into several components including speed, accuracy, agility, coordination, flexibility and balance (Ali, O. 1999: 3).

Fencing skills are divided into attack and defense. Attack is divided into simple attack, complex attack and counterattack. Counterattack includes several forms of attack movements the fencer initiates against the opponent while the opponent is performing attack or prepares for it by one of the attack preparations moves. Counterattack should be initiated in time to outstrip the opponent with a period and use all weaknesses that may appear in the original attack (Abd El-Aziz, I. 2003: 113).

Counterattacks are moves taken to exhaust the opponent's attack at the same time of engagement (Al-Sokkary, A. 1993: 13).

Counterattack is a stop-attack as the opponent stops his attack and the fencer performs his attack. This is known as a stop-attack (Mcinerney 2003: 9).

The researcher thinks that coordinative abilities help combining physical abilities together in an appropriate form suitable for fencing performance and this affects achievement level of various technical skills. According to the researcher's field experience, he noticed several difficulties facing junior epee fencers less than 20 years in initiating counterattack as fencers look unable to control body movement during motor performance. This may disturb movement and the motor sequence becomes incorrect. This is clear in poor links among technical stages of the skill during motor performance. The researcher thinks these difficulties result from limitations in some coordinative abilities of junior epee fencers.

As combat between fencers occurs under similar conditions of physical abilities, age, training experience, height and weight, the researcher thinks that a fencer can win the match using his coordinative abilities through choosing the proper tactic and performing the skill accurately. This is based on response speed and adaptation to changing conditions. It also depends on the fencer's ability to chose alternative solutions.

Aim:

The current research aims to identify:

- Coordinative abilities affecting the performance level of some counterattack variations.
- Contribution percentages of coordinative abilities in the performance level of some counterattack variations (counterattack with retreat – counterattack on preparation – attack on attack) in junior epee fencers.

Research questions:

1. What are the coordinative abilities affecting the performance level of some counterattack variations?
2. What are the contribution percentages of coordinative abilities in the performance level of some counterattack variations (counterattack with retreat – counterattack on preparation – attack on attack) in junior epee fencers?

2. Methods:

Approach:

The researcher used the descriptive approach.

Participants:

Research community included all junior epee fencers less than 20 years in Al-Qadeseia sports club. Participants (n=72) were purposefully chosen to represents five age groups (each group represents 2-3 years). In addition, another (20) fencers were recruited for the pilot sample. Table (1) shows participants' homogeneity.

Table (1) indicated that squewness values are between (±3). This clearly indicates participants' homogeneity.

Data collection tools:

- Total body coordination (jumping into numbered circles) (Allawy & Radwan 1982: 19)
- Agility (shuttle run) (Hasanain, M. S. 2001: 283)
- Speed (30 m running from movement) (Hasanain, M. S. 2001: 292)
- Accuracy (shooting with hand on overlap circles) (Hasanain, M. S. 2001: 361)
- Dynamic balance (octagonal shape) (Allawy & Radwan 1982: 342)
- Reaction speed (ruler test) (Allawy & Radwan 1982: 375)
- Hand-eye coordination (passing and receiving balls for 30 sec) (Hasanain, M. S. 2001: 328)

Pilot study:

The researcher performed the pilot study to achieve the following aims:

- Verifying tests accuracy
- Training assistants on testing and recording data procedures
- Validating research tools
- Verifying participants understanding for tests
- Calculating tests validity and reliability

Validity and Reliability of Tests:

Validity of tests was calculated using peripheral comparison of upper and lower quartiles. Reliability was calculated using test/retest procedures as tests were applied to a pilot sample (n=20) from the same research community and outside the main sample on 5/6-2-2018. Test was repeated one week after the first application.

Table (1): Participants Homogeneity (n=72)

S	Variables	Measurements	Mean	Median	SD	Squewness
1	**Age**	**Year**	18.52	18.5	0.86	0.07
2	**Height**	**Cm**	181.12	181.02	0.78	0.38
3	**Weight**	**Kg**	72.56	72.51	0.89	0.17
4	**Training experience**	**Year**	11.89	11.51	0.75	1.52
5	**Total body coordination**	**Sec**	10.35	10.32	1.31	0.07
6	**Agility**	**Sec**	10.29	10.23	0.62	0.29
7	**Speed**	**Sec**	5.37	5.39	0.35	-0.17
8	**Accuracy**	**Point**	11.79	11.58	1.47	0.43
9	**Dynamic balance**	**Rep**	5.86	5.45	1.03	1.19
10	**Reaction speed**	**Cm**	0.89	0.45	0.89	1.48
11	**Hand-eye coordination**	**Rep**	7.85	7.45	2.35	0.51
12	**Counterattack with retreat**	**Point**	10.86	10.56	0.68	1.32
13	**Counterattack on preparation**	**Point**	15.35	15.68	4.78	-0.21
14	**Attack on attack**	**Point**	4.85	4.82	0.97	0.09

Table (2) indicated statistically significant differences between distinct and non-distinct junior fencers in favor of distinct fencers on all coordinative abilities and attack skills tests. This proves tests validity.

Table (2): peripheral Comparison Validity for Coordinative Abilities and Attack Skills Tests (n=20)

Variable / Statistical treatment		Measurement	Upper quartile		Lower quartile		(t)
			Mean	SD±	Mean	SD±	
1	**Total body coordination**	**Sec**	8.57	1.08	11.69	0.48	5.82 *
2	**Agility**	**Sec**	9.51	0.37	11.04	0.06	9.18 *
3	**Speed**	**Sec**	5.06	0.05	5.68	0.18	7.87 *
45	**Accuracy**	**Point**	12.09	0.01	9.38	1.15	7.04 *
5	**Dynamic balance**	**Rep**	4.82	0.47	7.22	0.46	8.46 *
6	**Reaction speed**	**Cm**	- 1.7	0.53	0.81	0.46	7.55 *
7	**Hand-eye coordination**	**Rep**	11.01	1.75	5.41	0.54	6.88 *
8	**Counterattack with retreat**	**Point**	9.83	0.32	11.29	0.17	9.32 *
9	**Counterattack on preparation**	**Point**	21.5	1.15	9.01	1.23	16.67 *
10	**Attack on attack**	**Point**	5.7	0.85	3.61	0.54	4.82 *

(t) table Value on $P \leq 0.05 = 2.31$* Significant on $P \leq 0.05$

Table (3) shows statistically significant correlations between test and retest on all coordinative abilities and attack skills tests. This proves tests reliability.

Main Study:

Coordinative abilities and attack skills tests were applied to the main sample from 18-2-2018 to 4-3-2018.

Statistical Treatment:

The researcher used SPSS software to calculate the following: mean – SD – (t) test – one-way ANOVA – Pearson's correlation – stepwise regression.

Table (3): Correlation Coefficient Between Test and Retest of Coordinative Abilities and Attack Skills Tests (n=20)

	Statistical treatment / Variable	Measurement	Test 1		Test 2		R
			Mean	SD±	Mean	SD±	
1	Total body coordination	Sec	10.32	1.31	10.35	1.28	0.998 *
2	Agility	Sec	10.31	0.62	10.38	0.58	0.975 *
3	Speed	Sec	5.34	0.35	5.32	0.25	0.963 *
45	Accuracy	Point	11.41	1.47	11.85	1.14	0.644 *
5	Dynamic balance	Rep	5.92	1.03	5.51	1.16	0.639 *
6	Reaction speed	Cm	0.46	0.89	051	0.89	0.731 *
7	Hand-eye coordination	Rep	7.75	2.35	8.36	2.02	0.952 *
8	Counterattack with retreat	Point	10.67	0.68	10.52	0.58	0.997 *
9	Counterattack on preparation	Point	15.35	4.78	15.71	4.42	0.983 *
10	Attack on attack	Point	4.75	0.97	5.22	1.02	0.598 *

(R) table Value on $P \leq 0.05 = 0.444$* Significant on $P \leq 0.05$

3. Results:

Table (4) showed correlation among five coordinative abilities and the technical performance of counterattack with retreat. The least correlation (0.232) was for balance while the highest correlation (0.352) was for speed. This led the researcher to perform stepwise regression analysis.

Table (4) also showed correlation among five coordinative abilities and the technical performance of counterattack on preparation. The least correlation (0.428) was for agility while the highest correlation (0.856) was for total body coordination. This led the researcher to perform stepwise regression analysis.

Table (4) showed correlation among four coordinative abilities and the technical performance of attack on attack. The least correlation (0.356) was for hand-eye coordination while the highest correlation (0.789) was for accuracy. This led the researcher to perform stepwise regression analysis.

Table (4): Correlations Among Coordinative Abilities and Performance Levels of Counterattack Variations for Junior Epee Fencers.

S	Coordinative abilities	Counterattack with retreat	Counterattack on preparation	Attack on attack
1	Total body coordination	0.234 **	0.856 **	0.425 **
2	Agility	0.311 **	0.428 **	0.165
3	Speed	0.352 **	0.193	0.192
45	Accuracy	0.142	0.793 **	0.789**
5	Dynamic balance	0.232 *	0.212	0.195
6	Reaction speed	0.189	0.554 **	0.751 **
7	Hand-eye coordination	0.254 *	0.758**	0.356 **

R table value on $P \leq 0.05 = 0.232$ * Significant on $P \leq 0.05$
R table value on $P \leq 0.01 = 0.302$ ** Significant on $P \leq 0.01$

Table (5) indicated that contribution percentages of coordinative abilities to counterattack with retreat came as follows:

- Speed (14.35%)
- Speed and agility (22.70%) (8.35% higher)
- Speed, agility and hand-eye coordination (24.89%) (2.19% higher)
- Speed, agility, hand-eye coordination and total body coordination (26.25%) (1.36% higher)
- Speed, agility, hand-eye coordination, total body coordination and balance (27.15%) (0.9% higher)

Table (6) indicated that contribution percentages of coordinative abilities to counterattack on preparation came as follows:

- Total body coordination (22.59%)
- Total body coordination and accuracy (34.25%) (higher with 11.66%)

- Total body coordination, accuracy and hand-eye coordination (38.56%) (higher with 4.31%)
- Total body coordination, accuracy, hand-eye coordination and reaction speed (40.25%) (higher with 1.69%)
- Total body coordination, accuracy, hand-eye coordination, reaction speed and agility (41.28%) (higher with 1.03%)

Table (7) indicated that contribution percentages of coordinative abilities to attack on attack came as follows:

- Accuracy (26.23%)
- Accuracy and reaction speed (38.25%) (higher with 12.02%)
- Accuracy, reaction speed and total body coordination (44.25%) (higher with 6%)
- Accuracy, reaction speed, total body coordination and hand-eye coordination (48.95%) (higher with 4.70%)

Table (5): Multiple Stepwise Regression for Coordinative Abilities Contributing in Counterattack with Retreat for Junior Epee Fencers.

Step	Coordinative Abilities	R	F	Standard Error	Constant	Regression					Contribution %
						b1	b2	b3	b4	b5	
1	Speed	0.355	12.75	0.952	6.92	0.355					14.35 %
2	Agility	0.465	11.13	1.405	3.894	0.31	0.293				22.70 %
3	Hand-eye coordination	0.487	7.29	3.25	3.777	0.312	0.298	0.007			24.89 %
4	Total body coordination	0.478	5.98	3.354	4.593	0.287	0.274	-0.391	0.387		26.25%
5	Balance	0.482	3.84	3.474	4.486	0.286	0.278	-0.373	0.377	0.020	27.15 %

Table (6): Multiple Stepwise Regression for Coordinative Abilities Contributing in Counterattack on preparation for Junior Epee Fencers.

Step	Coordinative Abilities	R	F	Standard Error	Constant	Regression					Contribution %
						b1	b2	b3	b4	b5	
1	Total body coordination	0.772	58.56	0.558	1.652	0.772					22.59 %
2	Accuracy	0.810	45.23	0.553	2.512	0.526	0.355				34.25 %
3	Hand-eye coordination	0.456	62.25	0.458	0.365	0.658	0.254	0.254			38.56 %
4	Reaction Speed	0.258	32.54	0.821	0.256	0.677	0.226	0.356	0.028		40.25 %
5	Agility	0.658	32.58	0.931	0.645	0.672	0.569	0.356	0.025	0.125	41.28 %

Table (7): Multiple Stepwise Regression for Coordinative Abilities Contributing in Attack on Attack for Junior Epee Fencers.

Step	Coordinative Abilities	R	F	Standard Error	Constant	Regression				Contribution %
						b1	b2	b3	b4	
1	Accuracy	0.752	30.56	2.56	25.25	0.752				26.23 %
2	Reaction speed	0.892	42.15	2.46	26.58	1.025	0.158			38.25 %
3	Total body coordination	0.925	35.65	2.49	23.25	0.858	0.251	0.231		44.25 %
4	Hand-eye coordination	0.856	35.62	2.44	24.78	0.881	0.251	0.231	0.011	48.95 %

4. Discussion:

Answer to the first question:

According to these results, the researcher managed to answer the first question concerning the relationship of coordinative abilities affecting performance level of counterattack variations.

Table (4) showed statistically significant correlations between total body coordination with counterattack variations (counterattack with retreat – counterattack on preparation – attack on attack). Correlation value of total body coordination with counterattack with retreat was 0.234. Correlation value of total body coordination with counterattack on preparation was 0.856. Correlation value of total body coordination with attack on attack was 0.425. The researcher thinks that counterattack variations require different physical and technical performances performed at once through moving forward and backward in addition to correct performance of the technical skill according to opponent's speed and movements. These performances are based on basic skills and physical abilities without which the fencer can never perform the skill. This is consistent with Abd El-Aziz, I. (1999) who indicated that fencing requires good use of footwork, arms and trunk as this huge number of variables contribute to accurate initiation of fencing moves that require high coordination among feet, arms and eyes. Sadek, S. (2018) indicated that after mastering fencing skills, there is a need for highly coordinated technical performance. As an individual sport, it requires individual coordination that requires quick performance and coordination in estimating the situation in addition to quick action to achieve major goals of competition. Hussam El-Din, T. (1997) indicated that total body coordination has a great effect on accuracy. This is clear in feeling the right distance, direction and timing. To achieve elite performance levels, specific coordinative abilities should be improved during anj early stage of participation.

Table (4) showed statistically significant correlations between agility with counterattack variations (counterattack with retreat – counterattack on preparation – attack on attack). Correlation value of agility with counterattack with retreat was 0.311. Correlation value of agility with counterattack on preparation was 0.482. The researcher thinks that the fencer should change his body position with retreat backwards totally or partially as in counterattack on preparation very quickly to assume the right position to avoid the opponent's touch, opens a gap and then wins a touch. This is consistent with Abd El-Aziz, I. (1999) I that agility is very important when a quick shift of movements is assumed during fencing as immediate body position change for the whole body or part of it is required in some moves.

Table (4) showed statistically significant correlations between speed with counterattack with retreat. Correlation value of speed with counterattack with retreat was 0.352. The researcher thinks that during counterattack with retreat, the fencer needs to quickly move backwards to exhaust the opponent's attack. In this case, the fencer breaches distance and wins a touch or even quickly reaches for the opponent before the opponent opens the distance. In both cases, speed is vital for reaching for the opponent and gaining distance to win a touch. Abd El-Aziz, I. (2003) indicated that fencing skills are divided into attack and defense. Attack is divided into simple attack, complex attack and counterattack. Counterattack includes several forms of attack movements the fencer initiates against the opponent while the opponent is performing attack or prepares for it by one of the attack preparations moves. Counterattack should be initiated in time to outstrip the opponent with a period and use all weaknesses that may appear in the original attack. Salah El-Din, E. (2000) indicated that fencing is characterized by quick moves with quick blitz performance. Therefore, a fencer should perform all technical skills (attack – defense – retaliation – counterattack) quicker than the opponent in an accurate timing to win.

Table (4) showed statistically significant correlations between accuracy with counterattack variations (counterattack on preparation – attack on attack). Correlation value of accuracy with counterattack on preparation was 0.793. Correlation value of accuracy with attack on attack was 0.789. The researcher thinks that during counterattack on preparation and attack on attack the fencer has an opportunity to think as his body is stable ot in light tempo. This enables him to direct the blade to break the opponent's attack and win a touch. This is consistent with Haggag, H. (1995) who indicated the importance of considering standard levels of specific physical abilities especially for female fencers as accuracy is considered very important. Brunetti & De Santis (1992) indicated that accuracy is a major component of fencing as hitting target and wining a touch depends on it through continuous lunging to the chest. The main aim is to win as many touches as possible at the opponent's chest without exceeding the required limit of movement.

Table (4) showed statistically significant correlation between balance and counterattack with retreat on $P \leq 0.01$. the researcher thinks that the nature of counterattack with retreat requires the fencer to move backwards and reaches a balance point to initiate counterattack while controlling the distance

between him and the opponent. This is consistent with Hassanain, M. S. (2001) who indicated that balance requires feeling place and dimensions either visually or mentally. Ali, O. (2006) indicated that counterattack should be initiated from stance with the trunk leaning forward before the opponent's attack is complete.

Table (4) showed statistically significant correlations between reaction with counterattack variations (counterattack on preparation – attack on attack). Correlation value of reaction with counterattack on preparation was 0.554. Correlation value of reaction with attack on attack was 0.751. The researcher thinks that during counterattack on preparation, or attack on attack, the main aim is to approach the closest point to the opponent to breach his preparation or attack through monitoring the opponent's actions and quickly responding to them as the fencer uses any gap to win a touch through quick reaction. This is consistent with Abd El-Aziz, I. (2018) who indicated that fencing requires speed as slow fencers don't excel. Speed here means motor response speed including reaction and speed. This requires regular training to be improved due to its significant effects on fencers.

Table (4) showed statistically significant correlations between hand-eye coordination with counterattack variations (counterattack with retreat – counterattack on preparation – attack on attack). Correlation value of hand-eye coordination with counterattack with retreat was 0.254. Correlation value of hand-eye coordination with counterattack on preparation was 0.758. Correlation value of hand-eye coordination with attack on attack was 0.356. The researcher thinks thatduring instant interaction between a fencer and his opponent, the fencer can translate visual stimuli into skills performed by his hand. A good fencer should be able to link his vision to his moves to achieve proper technique. This is consistent with Manel, K. (1996) who indicated that good vision is required for fencers as they can touch their targets through estimating distance of fencing and maintaining it.

Answer to second question:

According to these results, the researcher managed to answer the second question concerning the percentages of contribution of coordinative abilities to performance level of counterattack variations.

Table (5) showed that speed contributed with (14.35%) in counterattack with retreat. This is because moving backwards quickly to open distance with the opponent is very important. Abd El-Aziz, I. (1999) indicated that good timing, correct reaction and proper distance in addition to accuracy and speed of performance are very significant in fencing.

Table (5) showed that speed and agility contributed with (22.70%) in counterattack with retreat with an increase of (8.35%). This is because the faster the fencer is the more agility he gains. Agility is important to move in several directions during the match quickly. This is consistent with Soliman, N. (2003) who indicated that agility is complex in nature because it is linked to speed and skillfulness. The athlete who can change his body position very quickly in a coordinative manner has agility.

Table (5) showed that speed, agility and hand-eye coordination contributed with (24.89%) in counterattack with retreat with an increase of (2.19%). This is because all physical abilities are required for successful counterattack with retreat. Accumulation of coordinative abilities leads to successful performance. This is consistent with Abd El-Khalek, E. (2018) who indicated that coordinative abilities are not separate. Instead, they are linked to each other to serve the combination of coordinated movement.

Table (5) showed that speed, agility, hand-eye and total body coordination coordination contributed with (26.25%) in counterattack with retreat with an increase of (1.36%). This is because total body coordination is important in moving the body backwards through moving the fencer's rear foot with smooth coverage with the armed arm as feet, trunk and arms move smoothly. Baleegh, H. (1999) indicated that coordination is the final image of coordinative abilities contributions to motor performance. It depends on the athlete's ability to use what he has of coordinative abilities and link them to motor performance achievement.

Table (5) showed that speed, agility, hand-eye, total body and balance coordination coordination contributed with (27.15%) in counterattack with retreat with an increase of (0.9%). This is because balance completes the coordinative abilities set through maintaining the correct position of body weight. Mostafa, A. (1998) indicated that balance is a basic pillar for coordinative abilities as it is a common factor in all other coordinative abilities.

Table (6) indicated that total body coordination contributed with (22.59%) to counterattack on preparation. The researcher thinks that total body coordination had this significant effect because a fencer can not perform counterattack without completing the movement nor through intermittent moves of the arms, trunk and legs. The fencer should enjoy total body coordination to exhaust the opponent's preparation, open a gap and win a touch.

Table (6) indicated that total body coordination and accuracy contributed with (34.25%) to counterattack on preparation with an increase of (11.66%). The researcher thinks that due to total body

coordination and monitoring the opponent's preparation, the fencer should perform his counterattack very accurately as in case of failure, the opponent may have the gap he wishes for and wins a touch. This means accuracy is very important. This is consistent with Brunetti & De Santis (1992) who indicated that accuracy is very significant to fencers as hitting the target and winning the match depend on it.

Table (6) indicated that total body coordination, accuracy and hand-eye coordination contributed with (38.56%) to counterattack on preparation with an increase of (4.31%). The researcher thinks that hand-eye coordination is important for directing the sword correctly according to opponent's preparation. This is consistent with Ali, O. (2006) who indicated that analyzing the opponent's movements is very important for counterattack to build up the counterattack upon this analysis to win a touch through hand-eye coordination.

Table (6) indicated that total body coordination, accuracy, hand-eye coordination and reaction speed contributed with (40.25%) to counterattack on preparation with an increase of (1.69%). The researcher thinks that reaction speed is important to respond accurately and quickly at the right time and right distance to the opponent's preparation through monitoring this preparation carefully. This is consistent with Mufreh, I. (1993) and Salah El-Din, E. (1995) who indicated that fencing requires quick reactions during the matches.

Table (6) indicated that total body coordination, accuracy, hand-eye coordination, reaction speed and agility contributed with (41.28%) to counterattack on preparation with an increase of (1.03%). The researcher thinks fencers need high levels of agility to initiate successful counterattacks through breaching the opponent's preparation and wining a touch. Abd El-Aziz, I. (1999) indicated that agility is important when the fencer is obliged to suddenly shit his body position during fencing as the whole body or parts of it assumes completely different positions during performance.

Table (7) indicated that accuracy contributed with (26.23%) to attack on attack. The researcher thinks that because of close levels of fencers and continuous attacks during the match, the most accurate fencer in performing attack on attack will win the touch. Accuracy is important to hit the target as winning a touch depends on it.

Table (7) indicated that accuracy and reaction speed contributed with (38.25%) to attack on attack with an increase of (12.02%). The researcher thinks that mastering motor skills and initiating them faster than the opponent enables fencers to breach the opponent's attack and win a touch. The winner is the one who initiates counterattack quickly and suddenly. Abd El-Khalek, E. (2018) indicated that motor reaction speed is a major requirement in all sports activities as it is very important in blitz attack games with quick changes in competition conditions.

Table (7) indicated that accuracy, reaction speed and total body coordination contributed with (44.25%) to attack on attack with an increase of (6%). The researcher thinks attack on attack should be performed very quickly through easy, simple and coordinated moves. Al-Sagheer, A. (2010) indicated that most situations in fencing training and competitions require quick shifts of playing situations in addition to speed to face the opponent's quick moves, quick shifts from one move to another, choosing the right time and expecting the target location. These situations require good coordination, meaning accuracy in identifying time, place and mechanics of movement.

Table (7) indicated that accuracy, reaction speed, total body coordination and hand-eye coordination contributed with (48.95%) to attack on attack with an increase of (4.7%). The researcher thinks that coordinating all body parts is necessary to win a touch. Mufreh, I. (1993) indicated that fencer's movements require muscular activity of several muscle groups in a specific sequence of time and place to generate efficient and accurate moves. This requires motor coordination.

Conclusions:

According to this research aims, questions, methods and results, the researcher concluded the following:

1- There is a statistically significant correlation between total body coordination and counterattack variations (counterattack with retreat – counterattack on preparation – attack on attack).

2- There is a statistically significant correlation between agility and counterattack variations (counterattack with retreat – counterattack on preparation)

3- There is a statistically significant correlation between speed and counterattack with retreat.

4- There is a statistically significant correlation between accuracy and counterattack variations (counterattack on preparation – attack on attack)

5- There is a statistically significant correlation between balance and counterattack with retreat

6- There is a statistically significant correlation between reaction speed and counterattack variations (counterattack on preparation – attack on attack)

7- There is a statistically significant correlation between hand-eye coordination and counterattack variations (counterattack with retreat – counterattack on preparation – attack on attack)

8- Contribution percentages of coordinative abilities in counterattack with retreat came as follows:

- Speed (14.35%)
- Speed and agility (22.70%) (8.35% higher)
- Speed, agility and hand-eye coordination (24.89%) (2.19% higher)
- Speed, agility, hand-eye coordination and total body coordination (26.25%) (1.36% higher)
- Speed, agility, hand-eye coordination, total body coordination and balance (27.15%) (0.9% higher)

9- Contribution percentages of coordinative abilities in counterattack on preparation came as follows:

- Total body coordination (22.59%)
- Total body coordination and accuracy (34.25%) (higher with 11.66%)
- Total body coordination, accuracy and hand-eye coordination (38.56%) (higher with 4.31%)
- Total body coordination, accuracy, hand-eye coordination and reaction speed (40.25%) (higher with 1.69%)
- Total body coordination, accuracy, hand-eye coordination, reaction speed and agility (41.28%) (higher with 1.03%)

10- Contribution percentages of coordinative abilities in attack on attack came as follows:

- Accuracy (26.23%)
- Accuracy and reaction speed (38.25%) (higher with 12.02%)
- Accuracy, reaction speed and total body coordination (44.25%) (higher with 6%)
- Accuracy, reaction speed, total body coordination and hand-eye coordination (48.95%) (higher with 4.70%)

Recommendations:

According to these conclusions, the researcher recommends the following:

1- Studying coordinative abilities and integrating them into training units for fencers.

2- Studying coordinative abilities in different age groups of epee fencers.

3- Performing similar studies on other weapon categories.

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