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REVIEW

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Examining the Correlation Analysis of Functional Movement Screening Test (Fms) with Upper Limb Function in Male (Amateur And Non-Amateur) Handball Players

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A B S T R A C T

The purpose of the study. is to see if there's a link between of male (Amateur and non-amateur) players college of physical education & sports science Al-Qadisiyah University functional sports screens (FMS) and upper limb function.

Materials and methods. The competition attracted 100 volleyball players ranging in age from 18 to 25 years old. BMI is calculated as 60-75 kg for heights of 170-200 cm. Keep a digital record for later analysis. At least 3 months before to involvement, there is no history of musculoskeletal injury. The seven functional motor evaluation exercise modes (squat, hurdle step, overhead squat action, inline lunge, shoulder flexibility, straight leg elevation test, trunk stability push-up test) are employed as assessment tools for sports injury prevention. Questionnaire for the Assessment of Arm Disability (DASH). This test is used to assess upper limb function. There is a significant Pearson correlation coefficient. p≤0.05 is used to check whether there is a connection between variables.

Results. Research results show that high scores for measuring arm injuries are different from performance screening test scores. (r=.178, P=0.01) There is a strong connection between them.

Conclusions. Coaches and sports experts seem to believe that choosing the right exam for athletes is crucial.

A R T I C L E I N F O

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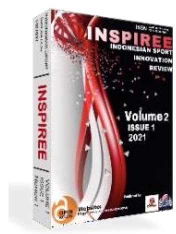

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Keywords: *questionnaire (dash); functional movement screen (fms); amateur & players & non-amateur players.*

INTRODUCTION

Daily physical activity has long been known to have numerous health advantages, including lowering the risk of many chronic diseases and premature death (WHO, 2010) (CDC, 2018). Elite athletes appear to have better health than the average population, with a higher life expectancy and a decreased chance of sickness and hospitalization

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Authors'Contribution: a-Study design; b-Data collection; c-Statistical analysis; d-Manuscript preparation; e-Funds collection.

(Sarna S, Sahi T, Koskenvuo M, et al, 1993) (Zwiers R, Zantvoord FWA, Engelaer FM, et al, 2012). As a result, they are more likely to acquire musculoskeletal disorders near the end of their careers and after long periods of infirmity (Kujala UMet al, 1996) (Drawer S, Fuller CW) (von Porat A, Roos EM, Roos H , 2004). Injury monitoring must be done on a regular basis if athletes' health is to be adequately protected. It gives crucial information on the severity and frequency of sports-related injuries. These epidemiology statistics can aid in the better planning and provision of medical treatment for athletes. Objectively informing and assisting in formulating injury and disease prevention measures is essential. Future injury risk factors and mechanism study can use these data to uncover and modify aspects connected to injury risk, such as safety precautions in sports laws and regulations, or athlete training practices and equipment (Finch C. A, 2006). Shoulder injuries are common in "overhead" sports such as baseball, tennis, swimming, and volleyball. Because the shoulder joint is built for mobility rather than stability, it is vulnerable to injury when subjected to the demands of these sports. Volleyball's unique talents, such as spiking and serving, can place a lot of strain on the shoulder straps. This load must be absorbed and released by the shoulder's stabilizing system in order to avoid injury. Static stabilizing muscles (including the glenohumeral joint, glenoid labrum, and shoulder ligaments) and dynamic stabilizing muscles make up the shoulder's stabilizing system (the four parts of the shoulder joint). Composition of muscle. Supraspinatus, infraspinatus, teres minor, and subscapularis are the muscles of the rotator cuff. The kinematics of volleyball spiking and serving are comparable to pitching, despite the obvious distinctions. The primary shoulder straps are repeatedly pressed by these overhead movements, which might result in soft tissue rupture and damage. Overloading the shoulder can produce cumulative injury if the pace of application of these stressors exceeds the rate of tissue healing. Volleyball medical practitioners should have a basic understanding of the kinematics of volleyball spikes and serves in order to better comprehend the mechanism of volleyball players' overuse of shoulder problems. (Jonathan C. Reeser and Roald Bahr, 20017). We classify injuries and illnesses as either new (no pre-existing, incomplete recovery conditions are recorded) or recurring (athletes who return to full participation after previous conditions) during the

PyeongChang Winter Olympics competitions or training (9-25 February 2018) Regardless of the repercussions of missing games or training, seek medical attention. Musculoskeletal illnesses, concussions, and other non-musculoskeletal traumas are examples of injuries. We only record the most severe diagnosis—determined by our research team based on all available clinical data—for analysis when a single event causes multiple types of damage. Serious injuries and illnesses are defined as those that are expected to cause more than one week of absence from training or competition (Junge A, Engebretsen L, Alonso JM, et al, 2008). Is it first and foremost vital to avoid injuries? Sports-related injuries account for one-sixth of all injuries seen by doctors in Scandinavia, according to epidemiological studies (Bahr et al., 2002). Sports-related injuries account for one-third of all hospitalizations among youngsters. (Bahr et al., 2002Between 1997 and 1998, an estimated 3.7 million sports and entertainment-related emergency room visits were made in the United States each year, accounting for approximately 11% of total emergency department visits for injuries; 2.6 million of these visits were made by those aged 5 to 24. The annual medical cost of these consultations is estimated to be $500 million. Is it necessary to continue to develop prevention strategies in the future? We appear to have more information regarding risk factors and their respective effects year after year. If the proportionate additional hazards associated with various risk factors are understood, some persons may be advised not to participate in sports when the risk factors cannot be eliminated. Individuals can participate in low-risk sports if they follow a specific training plan if they understand the effect of eliminating one risk factor after another. The goal must be to achieve a point where risk factors are identified and individuals can be assigned a relative risk of damage. Individuals with risk characteristics can be provided a proven training regimen during the preseason. Future study in this topic is still required, even at this point. Sports are continually evolving in nature, getting faster and more demanding. Consider the evolution of alpine skiing over the last 25 years. Almost all sports show the same improvement in speed. As a result, research into risk factors and damage processes must continue, as well as intervention studies. International cooperation is critical in such a rapidly changing industry. The International Olympic Committee's contribution in this book showcases sports injury prevention research and supports information transmission around the world. Furthermore, the book's effort has the endorsement of all major sports and sports medicine organizations, which bodes well for future growth.

For measuring functional movement patterns that are crucial to normal function, functional movement screening (FMS) is becoming increasingly popular. FMS is a quick, non-invasive, low-cost, and simple-to-use tool5 for evaluating the quality of basic whole-body movement patterns and detecting functional limitations and asymmetries. The screen includes seven functional sports test questions that evaluate trunk and core strength and stability, neuromuscular coordination, limb asymmetry during exercise, posture control, proprioception impairments, and flexibility. (Cook G, Burton L, Hoogenboom B., 2006) (Kiesel K, Plisky PJ, Voight ML., 2007) The motion quality of each of the seven screens is graded on a scale of 0 to 3 according to precise objective standards. A score of 3 is regarded normal, however a score of 2 or 1 indicates functional limitations. When discomfort happens during activity, it receives a score of 0. To obtain a composite score, the scores of each of the seven test items are summed together (range 0-21). Major functional limits and asymmetry from right to left are captured by the grading method. Unlike previous fitness tests, FMS focuses on the efficiency of exercise patterns rather than the number of repetitions or weightlifting attempts. (Cook G, Burton L, Hoogenboom B., 2006) This strategy is based in part on the idea that identifiable flaws in the movement pattern enhance the risk of harm. According to a survey of the literature, the majority of FMS papers focus on the link between FMSTM results and athletic performance or injuries in college and professional sports (Kiesel K, Plisky PJ, Voight ML., 2007).

MATERIALS AND METHODS

Study participants

Study participants (100 Female (Amateur and non-amateur) players college of physical education & sports science Al-Qadisiyah University.

Study Organization

College of physical education & sports science Al-Qadisiyah University Testing procedure: FMS is made up of seven component exams that examine several basic movement modalities. (Cook G. 2010) (Cook G, Burton L, Hoogenboom B, 2006) Squats, hurdles, straight lunges, shoulder flexibility, active straight leg elevation, trunk stability push-ups, and quadruped rotational stability tests were all conducted in order of balance (Figure 1). Five of the seven component tests used two-sided measures to assess asymmetry. The component test is asymmetric if there is a difference between the left and right sides, and the lower of the two values is included in the FMS composite score. FMS also contains three pain clearing tests in addition to the seven component tests: shoulder internal rotation and abduction, hand on opposite shoulder, lumbar extension in the prone position, and lumbar flexion in a quadruped at the end range. For shoulder mobility, trunk stability push-ups, and rotational stability tests, pain in the cleanup test results in a score of 0. Participants did not warm up before participating in any of the tests. Each component test is given a score from 0 to 3 points based on the quality of the activity, with 3 being the highest. (Cook G. 2010) (Cook G, Burton L, Hoogenboom B, 2006) A score of 2 means that the participant needs some compensation or is unable to complete the entire exercise. If the individual is unable to maintain the exercise posture during the entire exercise, loses balance during the test, or does not meet the minimum standard of score 2, 1 point is given. FMS component test or during any liquidation test indicates a score of 0. All participants are allowed to test each component up to 3 times and record the highest score obtained. Add the scores of each part of the test to get a comprehensive score from 0 to 21, where 21 is the highest comprehensive score. Additional details on test scores and overall scores for each component are provided elsewhere (Cook G. 2010) (Cook G, Burton L, Hoogenboom B, 2006).

RESULTS AAND DISCUSSION

100 participants (hundred females) met the inclusion and exclusion criteria and completed the study (TABLE 1). The mean , SD ,age, of the participants was (25.3697, 2 28.1903)years and their body mass index was 73.7457, 75.4943 kg/m2. Overall, the participants included routine exercisers who endorsed a statement that they exercised a mini- mum of 4 days per week (n= 50, 78.2%). Although the participants participated in their college of physical education & sports science Al-Qadisiyah University training, most of the participants were regular practitioners for more than 3 years.

Table 1. 95% CI

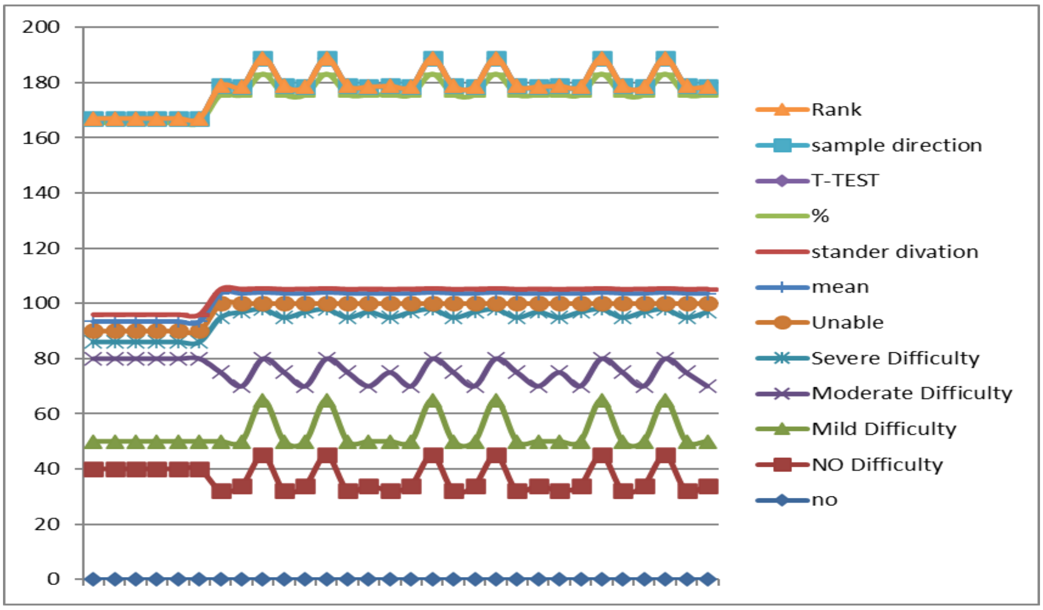
Type		
Age, y	21.2400، . 2.26131	1.3023، 1.4977
Height, cm	184.3000، . 9.10156	1.3666، 1.5734
Weight, kg Body mass index, kg/m^2	66.7000، . 3.51188	
	Abbreviation: CI, confidence interval	95% CI

Table 2. The participants didn't feel pain through the 3 FMS clearance tests. Inter rater reliability was calculated on 100 participants, based on an illness of 1 of the raters on day 2 of testing. Only 20% (n = 10) of the participants were identified to be at risk for injury, based on an FMS composite score of less than or equal to 14 points. Agreem` ent of the 7 component tests of the FMS (scored 0 to 3) demonstrated moderate to excellent inter rater agreement

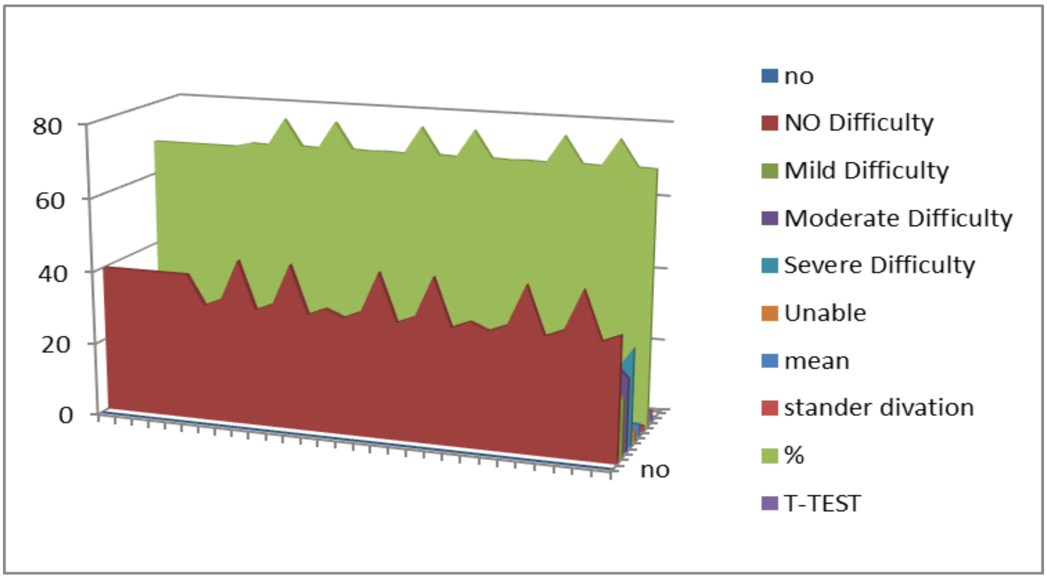
Test	0	1	2	3	Mean، SD
Trunk stability push-up	0	5	50	45	2.4 ،0.343434343
Quadruped rotary stability	0	3	42	55	2.52 ، 0.312727273
Shoulder mobility	0	2	48	50	2.48 ، 0.292525253
Active straight leg raise	0	1	39	60	2.59 ، 0.264545455
Deep squat	0	3	49	48	2.45 ، 0.310606061
Hurdle step	0	1	47	52	2.51 ، 0.272626263
In-line lunge	0	1	46	53	2.52 ، 0.272323232

Abbreviation: FMS, Functional Movement Screen. the first analysis of rater 1 on the first day of data collection
*The data displayed represent(n =50).female

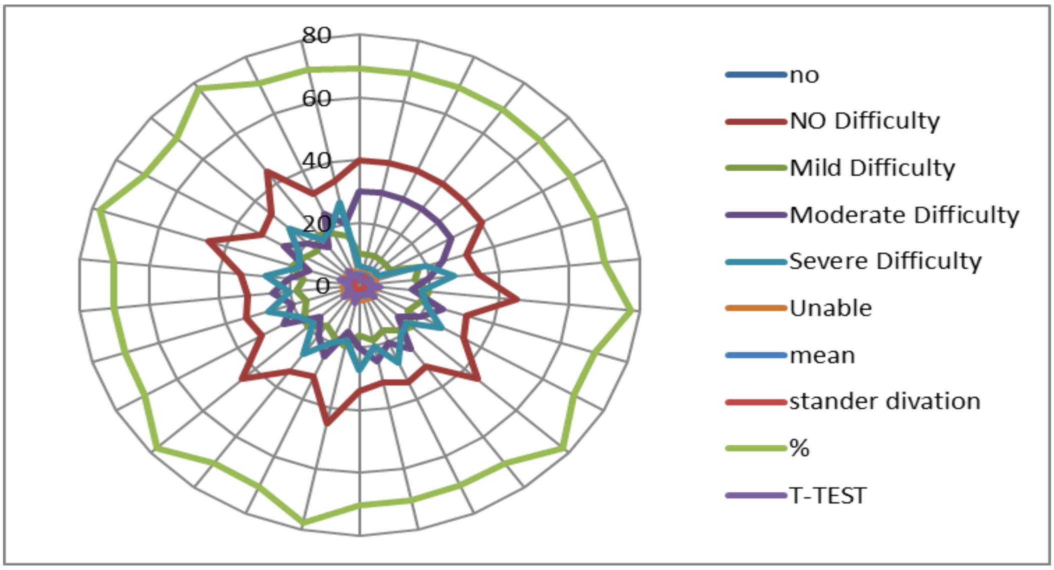
Graph 1. Represents the quantitative analysis of the questionnaire DASH



***Graph 2**. represents the quantitative analysis of the questionnaire DASH*



***Graph 3**. represents the quantitative analysis of the questionnaire DASH*

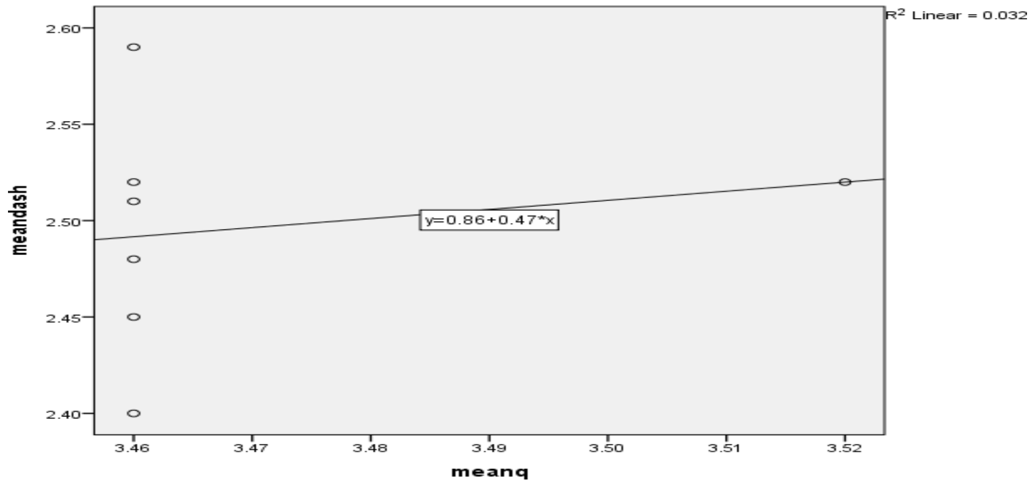


The Pearson correlation test results show that there is a significant correlation between the functional movement screening test (FMS) and upper limb function. These results can be seen in Table 3 and Figures 4 and 5. It should be noted that less questionnaires (DASH) show better performance, which leads to a negative number obtained from the Pearson torque correlation coefficient.

Table 3. FMS Component

r= .178 *p= 0.01***	***Dash questioner***

Graph 4. SCATTERPLOT(BIVAR)=mean dash WITH mean fms/MISSING=LISTWISE.



***Graph 5.** SCATTERPLOT(BIVAR)=sd dash WITH sd fms /MISSING=LISTWISE.*

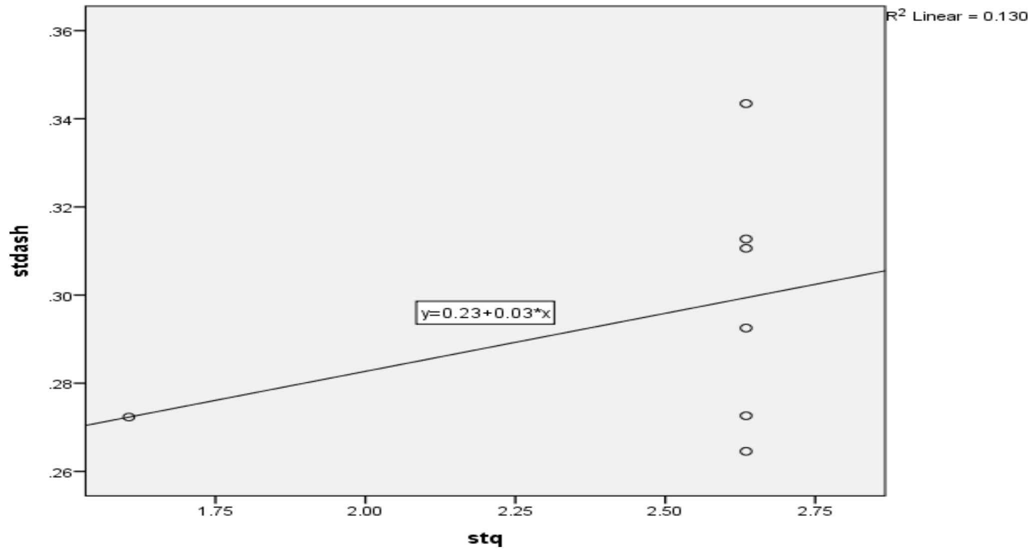


Table 4. represents the quantitative analysis of the questionnaire DASH quantitative

No	NO Difficulty	Mild Difficulty	Moderate Difficulty	Severe Difficulty	Unable	mean	stander divation	%	T-TEST	sample direction	Rank
q3	40	10	30	6	4	3.46	2.634747	69.2	1.745898	Moderate Difficulty	
q7	40	10	30	6	4	3.46	2.634747	69.2	1.745898	Moderate Difficulty	
q13	40	10	30	6	4	3.46	2.634747	69.2	1.745898	Moderate Difficulty	
q17	40	10	30	6	4	3.46	2.634747	69.2	1.745898	Moderate Difficulty	
q23	40	10	30	6	4	3.46	2.634747	69.2	1.745898	Moderate Difficulty	
q27	40	10	30	6	4	3.46	2.634747	69.2	1.745898	Moderate Difficulty	
q1	32	18	25	20	5	3.52	1.605657	70.4	3.238551	Mild Difficulty	
q2	34	16	20	27	3	3.51	1.666566	70.2	3.060185	Mild Difficulty	
q4	45	20	15	18	2	3.88	1.500606	77.6	5.864297	Mild Difficulty	
q5	32	18	25	20	5	3.52	1.605657	70.4	3.238551	Mild Difficulty	

q6	34	16	20	27	3	3.51	1.666566	70.2	3.060185	Mild Difficulty
q8	45	20	15	18	2	3.88	1.500606	77.6	5.864297	Mild Difficulty
q9	32	18	25	20	5	3.52	1.605657	70.4	3.238551	Mild Difficulty
q10	34	16	20	27	3	3.51	1.666566	70.2	3.060185	Mild Difficulty
q11	32	18	25	20	5	3.52	1.605657	70.4	3.238551	Mild Difficulty
q12	34	16	20	27	3	3.51	1.666566	70.2	3.060185	Mild Difficulty
q14	45	20	15	18	2	3.88	1.500606	77.6	5.864297	Mild Difficulty
q15	32	18	25	20	5	3.52	1.605657	70.4	3.238551	Mild Difficulty
q16	34	16	20	27	3	3.51	1.666566	70.2	3.060185	Mild Difficulty
q18	45	20	15	18	2	3.88	1.500606	77.6	5.864297	Mild Difficulty
q19	32	18	25	20	5	3.52	1.605657	70.4	3.238551	Mild Difficulty
q20	34	16	20	27	3	3.51	1.666566	70.2	3.060185	Mild Difficulty
q21	32	18	25	20	5	3.52	1.605657	70.4	3.238551	Mild Difficulty
q22	34	16	20	27	3	3.51	1.666566	70.2	3.060185	Mild Difficulty
q24	45	20	15	18	2	3.88	1.500606	77.6	5.864297	Mild Difficulty
q25	32	18	25	20	5	3.52	1.605657	70.4	3.238551	Mild Difficulty
q26	34	16	20	27	3	3.51	1.666566	70.2	3.060185	Mild Difficulty
q28	45	20	15	18	2	3.88	1.500606	77.6	5.864297	Mild Difficulty
q29	32	18	25	20	5	3.52	1.605657	70.4	3.238551	Mild Difficulty
q30	34	16	20	27	3	3.51	1.666566	70.2	3.060185	Mild Difficulty

Through the above table, we see the extent to which the opinions of the sample deviate from the agreed-upon opinion .The results are shown in Table (6) by calculating the t-test. Successive degrees of freedom = n-1.100-1 = 99 does not exist in the guardian table of inevitable freedom (T- test). Choose the closest degree of freedom, 90. Check the critical value table as the test (t - test). Show that the table value (T) = (1.987).

In questions q3,q7,q13,q17,q23&q27 when comparing the calculated value of (T), its value is (1.745898) and the value of (T) table, and its value is (1.987), we find that the calculated value of (T) is smaller than the (T) table, and this shows that the test is not statistically significant write.

In questions q1,q2,q5,q6,q9,q10,q11,q12,q15,q16,q19,q20,q21,q22,q25,q26,q29 &q30 when comparing the calculated value of (T), its value is (3.238551) and the value of (T) table, and its value is (1.987), we find that the calculated value of (T) is greater than that of (T), which indicates that the test is statistically The above is significant.

In questions q4,q8,q14,q18,q24&q28, when comparing the calculated value of (T), its value is (5.864297) and the value of (T) table, and its value is (1.987), we find that the calculated value of (T) is greater than that of (T), which indicates that the test is statistically The above is significant.

Qualitative analysis represents the quantitative analysis of the questionnaire DASH:

Question. (3) (turn the key). Question. (13) (shampoo or blow dry hair). Question . (17) (entertainment activities that require little effort (for example, playing cards, knitting, etc.). Question. (23) During the past week, were you limited in your workor other regular daily activities as a result of your arm, shoulder or hand problem? (circle number)Question .(7) (doing heavy housework (for example, washing walls, washing floors)). Question. (27) Weakness in your arm, shoulder or hand.The percentage of study sample members that have been answered (69.2%) is Moderate Difficulty.

Question . (1) Stands for (open a tight or new jar) Question . (2) This means that (Write). Question . (5) Means (pushing open a heavy door). Question. (6) which represents'(Place an object on a shelf above your head) Question. (9) It stands for (make a bed...). Question. (10) Indicates (carrying a shopping bag or briefcase). Question . (11) Representative (carry heavy objects (over 10 pounds). Question . (12) which represents'(Change a light bulb overhead). Question . (15) It represents (put on a pullover). Question. (16) Indicates (cutting food with a knife). Question (19) Representative (entertainment activities where you can move your arms freely (for example, playing frisbee, badminton, etc). Question . (20) This represents (management of transportation demand (from one place to another). Question. (21) sexual activity). Question. (22) During the past week, to what extent has your arm,shoulder or hand problem interfered with your normal social activities with family, friends, neighbours or groups?. Question. (25) Arm, shoulder or hand pain when you performed any specific activity. Question. (26) Tingling (pins and needles) in your arm, shoulder or hand. Question. (29) During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder or hand? . Question. (30) feel less capable, less confident or less useful because of my arm, shoulder or hand problem. The research sample members who have obtained a percentage (70.4_70.2%) are of Mild Difficulty. Question . (4) preparing a meal. Question. (8) garden or yard work. Question . (14) Wash your back. Question. (18)recreational activities in which you endure a certain force or impact with your arms, shoulders, or hands (for example, golf, hammering, tennis, etc.) Question. (24) Arm, shoulder or hand pain.Question. (28) Stiffness in your arm, shoulder or hand. A percentage (77.6%) of the research sample members are in Mild Difficulty.

CONCLUSION

In conclusion It seems necessary for coaches and sports experts to choose suitable tests for athletes to prevent sports injuries and can effectively reduce the cost of treatment and improve the level of exercise.

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CONFLICT OF INTEREST

The Pearson correlation test results show that there is a significant correlation between the functional movement screening test (FMS) and upper limb function. These results can be seen in Table 3 and Figures 4 and 5. It should be noted that less questionnaires (DASH) show better performance, which leads to a negative number obtained from the Pearson torque correlation coefficient.

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APPENDIX

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