تقييم ارتباط أنماط حركة الجسم وتحليل العلاقة بين اختبار فحص الحركة الوظيفية (FMS) مع وظيفة الطرف العلوي لدى لاعبي كرة الريشة الإناث(الهواة)

حامد عبد الساده الاكرح   nnoor1202@gmail.com
د. هومن مينو نژاد   h.minoonejad@ut.ac.ir
د. فواد صيدى   foadseidi@ut.ac.ir
د. محمد كريمى زاده اردكانى   m.karimizadeh@ut.ac.ir

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ملخص البحث

تقييم ارتباط أنماط حركة الجسم وتحليل العلاقة بين اختبار فحص الحركة الوظيفية (FMS) ومع وظيفة الطرف العلوي لدى لاعبي كرة الريشة الإناث (الهواة) خلفية فحص الحركة الوظيفية (FMS) لقد أصبح شائعًا بشكل متزايد في تحديد القيود الوظيفية في الحركات الوظيفية الأساسية. أجريت هذه الدراسة الاستكشافية والاستقصائية لتأكيد جدوى تطبيق FMS بين لاعبي كرة الريشة الهوات. كان الغرض من هذه الدراسة هو التحقيق في العلاقة بين شاشات الحركة الوظيفية (FMS) للاعبات كرة الريشة من الإناث وطرق وظائف الأطراف العلوية. جودة الوظيفة. في كثير من الحالات ، يوجد ضعف أو توتر في العضلات أو مجموعات العضلات ، ثم يتم علاجه بأنشطة التمدد أو التقوية الفردية ، بدلاً من استخدام أنماط التمرين القياسية التي يمكن أن تعالج إصابات متعددة في نفس الوقت. وبالمثل ، غالبًا ما يركز العديد من المحترفين على مجالات شكوى محددة ، بدلاً من البدء بتحديد ميزة الحركه الكامل وربط هذه الميزة بالخلل الوظيفي. هذا هو التعلم. شارك في المسابقة ٥٠ لاعبي كرة الريشة الهوات تتراوح أعمارهم بين ١٨ و ٣٥ عاماً , وكانت المتوسطات الحسابيه والانحرافات المعياريه للعمر 26.7800□4.96227 . الطول ١٧٠-٢١٠ سم وكانت المتوسطات الحسابيه والانحرافات المعياريه للطول 192.9000□9.65581يُحسب مؤشر كتلة الجسم على أنه ٦٠-٨٠ كجم وكانت المتوسطات الحسابيه والانحرافات المعياريه لكتله الجسم ويتم تسجيله رقميًا لتحليله لاحقًا. لا يوجد تاريخ لإصابة الجهاز العضلي الهيكلي لمدة ٣ أشهر على الأقل قبل المشاركة سبعة أنماط حركة لتقييم الحركة الوظيفية (القرفصاء ، عقبة ، القرفصاء العلوي ، الاندفاع المضمن ، الكتف ، المرونة ، اختبار رفع الساق المستقيمة ، اختبار تمرين ثبات الجذع) كتقييم أدوات الوقاية من الإصابات الرياضية. استماره تقييم إعاقة الذراع (DASH). يستخدم لتقييم وظيفة الطرف العلوي. معامل ارتباط بيرسون معنوي ، p≤0.05. يستخدم لاختبار العلاقات بين المتغيرات: أظهرت النتائج أن هناك فرقًا بين الدرجات في اختبار فحص الأداء المستخدم لقياس عجز الذراع والدرجات العالية. P = ٠.٠١/ (r = - 124 توجد علاقة ذات دلالة إحصائية. الاستنتاجات: يبدو من الضروري للمدربين والمحترفين الرياضيين اختيار الاختبارات المناسبة للرياضيين للوقاية من الإصابات الرياضية ، ويمكن أن يقلل بشكل فعال من تكلفة العلاج ويحسن مستوى التمرين. لذلك ، بناءً على نتائج هذه الدراسة ، يمكن القول أنه على الرغم من تقديم الاختبار كأداة تقييم للوقاية من الإصابة. ومع ذلك ، لم يتم دراسة علاقتها بالاختبارات الوظيفية الأخرى وبعض عوامل اللياقة البدنية.

الكلمات المفتاحية :استبيان (داش). شاشة الحركة الوظيفية (FMS). لاعبي تنس الريشة الهواة الإناث ، وظيفة الطرف العلوي

Evaluating Body Movement Patterns Correlation& Analysis of The Relationship Between Functional Movement Screening Test (Fms) And With Upper Limb Function In Female (Amateur) Badminton Players

Mr. Hamid Aabdulsada Kadhim AL- akrh
Iraqi Ministry of Education Directorate of Al Diwaniyah Education

prof. Hooman Minoonejad
prof. Fouad Saidi
Dr..Mohammad Karimizadeh Ardakani
University of Tehran Department of Pathology and Corrective Movements

Abstract

Background Functional Movement Screening (FMS) It has become Increasingly popular in identifying functional limitations In basic functional movements .This exploratory and investigative study was conducted to confirm the feasibility of implementing FMS among active Female Amateur Badminton players. The purpose of this study was to Investigate the relationship between functional movement screens(FMS) of Female Amateur Badminton players and upper limb function Methods More practical and comprehensive alternatives to exercise Screening is critical for understanding *human function and identifying impaired and dysfunctional movement patterns that reduce function quality. In many cases, weakness or tension in muscles or muscle groups Is usually found, and then treat with individual stretching or strengthening activities, rather than using standard exercise patterns that can address multiple injuries at the same time. Likewise, many professionals often focus on specific complaining areas, rather than starting with identifying an integrative motor feature and correlating that feature with dysfunction. This is learning; 50 Female Amateur Badminton players between the ages of 18 and 35 participated in the competition and the means and standard deviations of the age were 26.7800 · 4.96227. Height 170-210 cm and the mean and standard deviations of height were 192.9000 · 9.65581. BMI Is calculated as 60-80 kg and the arithmetic means and standard deviations of body mass 74.6200 · 3.07651. and recorded digitally for later analysis. No history of musculoskeletal injury for at least 3 months prior to participation .Seven movement patterns for functional movement assessment (squat, hurdle, overhead squat, Inline lunge, shoulder, flexibility Straight Leg Raise Test, Trunk Stability Push-Up Test) as assessment tools for sports injury prevention. Arm Disability Assessment surveys (DASH). Used to assess upper limb function .Pearson correlation coefficient Is significant,.p≤0.05 used to test for relationships between variables:*

Keywords:
Questionnaire (DASH). Functional Movement Screen (FMS). Female Amateur Badminton players, upper limb function

Introduction& The Impotent Of The Studying

Badminton is an individual, non-contact sport that requires jumps, lunges, quick changes of direction, and rapid arm movements from various body positions. The physical demands of badminton suggest that acute injuries to the extremities may occur frequently[١] However, overuse injuries can also affect the back, shoulders, calves, and knees [٢,3]The lower extremities are subjected to high stress in the demanding sport of badminton, which can lead to discomfort and injury. [4]In the upper extremity, the joint that bears the greatest load is the shoulder. These movements are usually abduction/external rotation, and the rapid movement of the arm places severe loads on the joints and can lead to shoulder, elbow, and wrist injuries. [3]No recent studies have been conducted to obtain epidemiological data on badminton injuries.,[5] Functional exercise screening (FMS) has become more and more popular for evaluating functional exercise patterns that are critical to normal function. FMS is a fast, non-invasive, inexpensive, and easy-to-manage tool5 that can assess the quality of basic whole-body movement patterns and identify functional limitations and asymmetries. The screen consists of seven different functional sports test items to assess trunk and core strength and stability, neuromuscular coordination, limb asymmetry during exercise, posture control, proprioception deficits and flexibility[6,7] According to specific objective standards, the motion quality of each of the seven screens is scored on a scale of 0-3. A score of 3 is considered normal, while a score of 2 or 1 represents the level of functional limitation. When pain occurs during exercise, it is scored as 0 points. The scores of each of the seven test items are added together to generate a composite score (range 0-21). The scoring system is designed to capture major functional limitations and asymmetry from right to left. Unlike other fitness assessments, FMS emphasizes the efficiency of exercise patterns, rather than the number of repetitions performed or the number of weightlifting. 17 This approach is based in part on the assumption that identifiable defects in the movement pattern increase the susceptibility to injury. Literature review shows that most of the articles published on FMS focus on the relationship between FMSTM results and athletic performance or injuries in college and professional sports,[7]

More practical and comprehensive alternatives to sports screens are essential for understanding human functions and identifying impairments and dysfunctional sports patterns that reduce functional quality. In many cases, weakness or tension in muscles or muscle groups is usually found, and then treated with separate stretching or strengthening activities, rather than using standard exercise patterns that can solve multiple injuries at the same time. This study tried to consider the relationship between the new requirements affecting the functional sports screening test (FMS) and the upper limb function of female (amateur) badminton players. So the importance of this research

Objective study

The purpose of this study was to investigate the correlation between functions sports screen (FMS) and disability Questionnaire (DASH)and upper limb function of female (amateur) badminton players

The Study Problem

The Functional Movement Screen (FMS)[8,9], and later the Selective Functional Movement Assessment (SFMA)[10], Developed to help clinicians and healthcare professionals screen individuals for the risk of injury and/or dysfunction or performance-limiting exercise patterns. FMS first appeared commercially as a manual for screening athletes, and later the product line expanded to include a series of screening equipment, certifications for screening athletes, seminars, books, and videos.[11]FMS is a tool used to identify asymmetries that cause functional motor deficits. FMS aims to identify imbalances in mobility and stability among the seven basic movement modes. These movement modes are designed to provide observable performance of basic movement, manipulation and stable movement by placing the individual in extreme positions. If proper mobility and movement control are not used, weakness and imbalance will become apparent. Once these deficiencies are identified through FMS, a corrective exercise plan will be developed to prevent musculoskeletal damage. FMS is designed to screen individuals with functional motor deficits, which may indicate an increased risk of injury. The use in the literature ranges from young and active individuals to middle-aged individuals, elite, college and professional athletes, as well as military personnel and firefighters. It has been noted that lower FMS scores are associated with increased BMI, increased age, and decreased activity levels.[12] The purpose of this research is. The impact of correlation The relationship between the functional sports screening test (FMS) of female (amateur) badminton players and upper limb function. So research the problem.

Procedures

FMS consists of 7 component tests to evaluate different basic movement modes. [10,12,13] Participants completed component tests in order of balance, including squats, hurdles, straight lunges, shoulder flexibility, active straight leg elevation, trunk stability push-ups, and quadruped rotational stability tests (Figure 1). Five of the seven component tests evaluated asymmetry through two-sided measurements. If there is a difference between the left and right sides, the component test is asymmetric, and the lower of the 2 scores is included in the FMS composite score. In addition to the 7 component tests, FMS also includes 3 pain clearance tests: shoulder internal rotation and abduction, hand on the opposite shoulder, lumbar extension in the prone position, and lumbar flexion in a quadruped at the end range . Pain in the cleanup test results in a score of 0 for shoulder mobility, trunk stability push-ups, or rotational stability tests, respectively. Participants performed all tests without warming up before participating. Each component test is scored in order (0 to 3 points) based on the quality of exercise, with 3 points being the highest score. [10,12,13]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. [10,12,13]

Figure(1) Functional Movement Screen (FMS) (A)Hurdle step(B) Stability trunk push-up(C)Unloaded deep squat (D)Rotatory (E) Shoulder mobility(F) In line lunge (G)Active straight leg raise stability

Table No.1 TEST Mean ± SD Age, y, Height, cm Weight, kg ,Body mass index, kg/m2		
Type	Mean ± SD	95% CI
Age, y	26.7800±4.96227	25.3697, 2 28.1903
Height, cm	192.9000±9.65581	190.1558, 195.6442
Weight, kg	74.6200±3.07651	73.7457, 75.4943
Body mass index, kg/m^2		

Abbreviation: CI, confidence interval

The study hypotheses:

H_0 : There is no relationship between the two variables in the research sample

H_1 : There is relationship between the two variables in the research sample

Methodology

The researchers used a descriptive investigation method to address the nature of the problem

Place field: female (amateur) badminton players park lala Iran Tehran

Human Field: female (amateur) badminton players

Time Field: from 1/5/2022 to 30/6/2022

The study sample: 50 female (amateur) badminton players

Statistical Methods

After collecting the research data, use the software Microsoft Excel and (spss) version 22 and use descriptive and inferential statistics to analyze the raw data obtained from the research variables. The Pearson correlation coefficient is used to test the relationship between the functional sports screening test and the static and dynamic balance test scores. In addition, the significance level in this study is at the level of 95%, and a smaller and equal alpha (0.05) is considered.

Discussion and analysis of results Fifty participants (50 female) 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 were attending training for their 50 female (amateur) badminton players, Most participants were regular exercisers for 3 years. Specifically, 20 (45.3%) participants reported performing routine exercise for more than 5 years, 16 (32.8%) for 3 to 5 years,9 (14.1%) for 3 years, and 5 (7.8%) for less than years .TABLE 2. No participant experienced pain during the 3 FMS clearance tests. Inter rater reliability was calculated on 50 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. Agreement of the 7 component tests of the FMS (scored 0 to 3) demonstrated moderate to excellent inter rater agreement

TABLE No. 2Test Functional Movement Screen (FMS)

Test	0	1	2	3	Mean ± SD
Trunk stability push-up	0	5	20	25	2.4± 0.4
Quadruped rotary stability	0	3	42	5	2.04 ± 0.161
Shoulder mobility	0	2	19	29	2.54 ± 0.335
Active straight leg raise	0	1	26	23	2.44 ± 0.292
Deep squat	0	3	28	19	2.32 ± 0.344
Hurdle step	0	1	37	12	2.22 ± 0.215
In-line lunge	0	1	16	33	2.64 ± 0.275

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

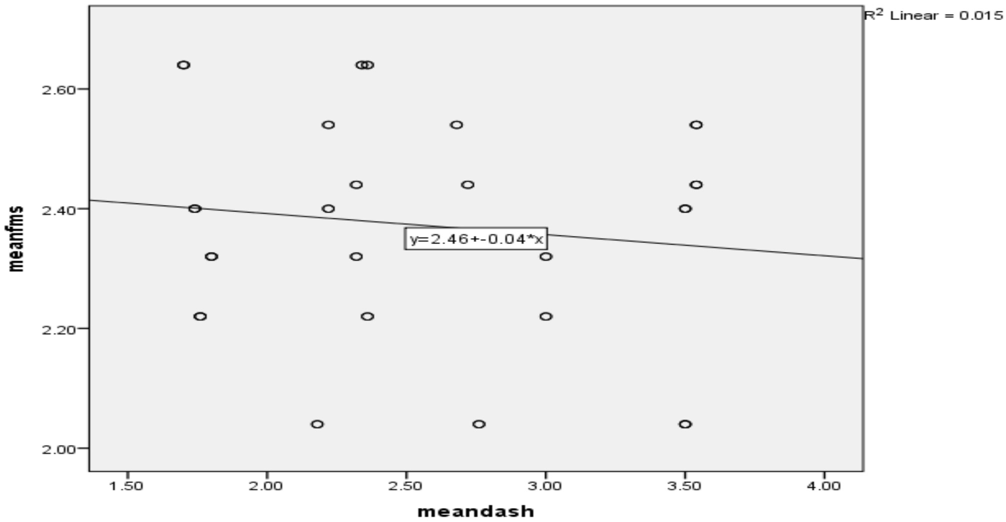
The results of Pearson correlation test showed that there is a significant relationship between functional movement screening test (FMS) and upper limb function it . These results can be seen in Table 3 and Figures 4 and 5. It should be noted that less questionnaires (DASH) show better performance, which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

TABLE No.3 relationship between functional movement screening test (FMS) and upper limb function

FMS Component	
r= -.124	Dash questioner
p= 0.01**	

Graph No(1)

/Scatterplot(Bivar)=Mean Dash Questionnaire With Mean Functional Movement Screening Test (Fms) /Missing=Listwise.



Graph No(2) /Scatterplot(Bivar)=Sd Dash Questionnaire With Sd Functional Movement Screening Test (Fms) /Missing=Listwi

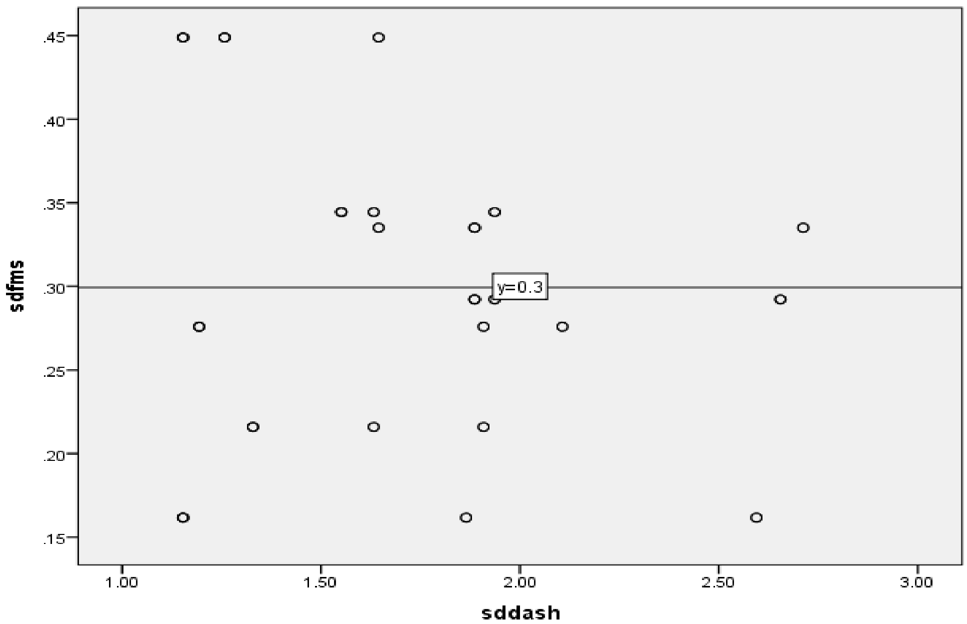


Table No. (4) represents the quantitative analysis of the questionnaire DASH quantitative

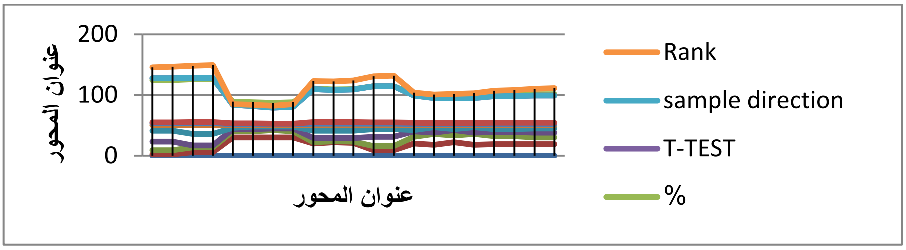
no	NO Difficulty	Mild Difficulty	Moderate Difficulty	Severe Difficulty	Unable	mean	stander divation	%	T-TEST	sample direction	Rank
q17	6	8	3	19	14	3.54	1.886122449	70.8	2.024153	Severe Difficulty	21
q7	6	8	3	19	14	3.54	1.886122449	70.8	2.024153	Severe Difficulty	20
q19	2	7	14	18	9	3.5	1.153061224	70	3.065752	Severe Difficulty	19
q9	2	7	14	18	9	3.5	1.153061224	70	3.065752	Severe Difficulty	18
q13	9	7	15	13	6	3	1.632653061	60	0	Moderate Difficulty	17
q3	9	7	15	13	6	3	1.632653061	60	0	Moderate Difficulty	16
q21	21	2	6	12	9	2.72	2.654693878	54.4	-0.7457	Moderate Difficulty	15
q16	22	2	5	12	9	2.68	2.711836735	53.6	-0.83427	Moderate Difficulty	14
q6	20	2	7	12	9	2.76	2.594285714	55.2	-0.65405	Moderate Difficulty	13

q18	19	11	8	7	5	2.36	1.908571429	47.2	-2.37078	Mild Difficulty	12
q8	19	11	8	7	5	2.36	1.908571429	47.2	-2.37078	Mild Difficulty	11
q11	19	13	7	5	6	2.32	1.936326531	46.4	-2.48285	Mild Difficulty	10
q1	19	13	7	5	6	2.32	1.936326531	46.4	-2.48285	Mild Difficulty	9
q14	18	18	2	9	3	2.22	1.644489796	44.4	-3.35338	Mild Difficulty	8
q12	22	11	9	2	6	2.18	1.864897959	43.6	-3.1087	Mild Difficulty	7
q4	18	18	2	9	3	2.22	1.644489796	44.4	-3.35338	Mild Difficulty	6
q2	20	11	9	2	8	2.34	2.106530612	46.8	-2.21511	Mild Difficulty	5
q20	30	10	5	3	2	1.74	1.25755102	34.8	-7.08377	NO Difficulty	4
q10	30	12	3	3	2	1.7	1.193877551	34	-7.69844	NO Difficulty	3
q15	30	10	4	4	2	1.76	1.328979592	35.2	-6.59664	NO Difficulty	2
q5	30	10	4	2	4	1.8	1.551020408	36	-5.46995	NO Difficulty	1

The results are shown in Table (4) by calculating the t-test. what follows The degree of freedom = n-1.50-1 = 49 does not exist in the table of the guardian of the inevitable freedom(T-test).choose the nearest degree of freedom, 48.By looking at the table of critical values for the test (t-test).Show that the table value (T) = (2.011).In question No. 17, when comparing (T) calculated, whose value is (2.024153) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant.In question No. 7, when comparing (T) calculated, whose value is (2.024153) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant.In question No. 19, when comparing (T) calculated, whose value is (3.065752) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant.In question No. 9, when comparing (T) calculated, whose value is (3.065752) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant.In question No. 13, when comparing (T) calculated, whose value (0) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is less than (T) tabular, and this indicates that the test is not statistically significant In question No. 3, when comparing (T) calculated, whose value (0) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is less than (T) tabular, and this indicates that the test is not statistically significant In question No. 21, when comparing (T) calculated, whose value is (-0.7457) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No. 16, when comparing (T) calculated, whose value is (-0.83427) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No. 6, when comparing (T) calculated, whose value is(-0.65405) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No. 6, when comparing (T) calculated, whose value is(-2.37078) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No. 18, when comparing (T) calculated, whose value is(-2.37078) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No. 8, when comparing (T) calculated, whose value is(-2.37078) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No. 11, when comparing (T) calculated, whose value is(-2.48285) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No. 1, when comparing (T) calculated, whose value is(-2.48285) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No. 14, when comparing (T) calculated, whose value is(-2.48285) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No. 12, when comparing (T) calculated, whose value is(-3.1087) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No.4, when comparing (T) calculated, whose value is(-3.35338) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant.

In question No.2, when comparing (T) calculated, whose value is(-2.21511) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No.20, when comparing (T) calculated, whose value is(-7.08377) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No.10, when comparing (T) calculated, whose value is((-7.69844) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No.15, when comparing (T) calculated, whose value is(-6.59664) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant. In question No.5, when comparing (T) calculated, whose value is(-5.46995) with (T) tabular, whose value is (2.011), we find that the calculated value of (T) is greater than (T) tabular, and this indicates that the test is statistically significant.

GRAPH No. (4) Represents The Quantitative Analysis Of The Questionnaire DASH



<u>qualitative analysis represents the quantitative analysis of the questionnaire DASH:</u>

Question No. (7) which represents(Do heavy household chores (e.g., wash walls, wash floors).) Question No. (17) which represents'(Recreational activities which require little effort(e.g., card playing, knitting, etc.). has answered obtained a percentage (70.8%) of the study sample members was Severe Difficulty. Question No. (19) which represents(Recreational activities in which you move your arm freely (e.g., playing frisbee, badminton, etc.)Question No. (9) which represents'(Make a bed..). has obtained a percentage (70%) of the study sample members was Severe Difficulty. Question No. (13) which represents(Wash or blow dry your hair) Question No. (3) which represents'(Turn a key). has obtained a percentage (60%) of the study sample members was Moderate Difficulty. Question No. (21) which represents(Sexual activities) has obtained a percentage (54.4%) Question No. (16) which represents'(Use a knife to cut food.) has obtained a percentage (53.6%). of the study sample members was Moderate Difficulty. Question No. (6) which represents'(Place an object on a shelf above your head.) has obtained a percentage (55.2%). of the study sample members was Moderate Difficulty. Question No. (18) which represents(Recreational activities in which you take some force or impact through your arm, shoulder or hand(e.g., golf, hammering, tennis, etc.). Question No. (8) which represents'(Garden or do yard work) has obtained a percentage (47.2%) of the study sample members was Mild Difficulty .Question No. (11) which represents(Carry a heavy object (over 10 lbs)) Question No. (1) which represents'(Open a tight or new jar.). has obtained a percentage (46.4%) of the study sample members was Mild Difficulty Question No. (14) which represents(Wash your back.) has obtained a percentage (44.4%) Question No. (12) which represents'(Change a light bulb overhead) has obtained a percentage (43.6%). of the study sample members was Mild Difficulty. Question No. (4) which represents(Prepare a meal.) has obtained a percentage (44.4%) Question No. (12) which represents'(Write.) has obtained a percentage (46.8%) of the study sample members was Mild Difficulty. Question No. (20) which represents(Manage transportation needs(getting from one place to another).) has obtained a percentage (34.8%) Question No. (10) which represents'(Carry a shopping bag or briefcase.) has obtained a percentage (34%). of the study sample members was NO Difficulty. Question No. (15) which represents(Put on a pullover sweater.) has obtained a percentage (35.2%) Question No. (5) which represents'(Push open a heavy door.) has obtained a percentage (36 %). of the study sample members was NO Difficulty

<u>Discuss the interpretation of the results</u>

The contents related to this are stated in three parts, the first part is related to the summary of the research, the second part is related to the results of the current research and the interpretation of the obtained results, and the last part is the suggestions of the research. At the beginning, the summary of the research is presented and then the results obtained from the research are discussed. In each section, an attempt has been made to refer to similar researches while interpreting the obtained results. At the end, while presenting the suggestions derived from the research, suggestions for further research have been presented.

<u>Summary of the research</u>

Examining repetitive and compensatory movements is one of the important factors that if the athlete does not pay special attention to it, he will be exposed to serious injury. Sometimes a traumatic muscle imbalance is the trigger for a functional compensatory movement that leads to a sports injury [14]. Due to the increase in sports injuries, pre-season screening of athletes in competitive and non-competitive sports is common nowadays. Screening is done in order to prevent harm and also improve implementation strategies [15]. Through screening during post-season examinations, it is possible to give valid specific exercise programs to people who have some risk factors [16].FMS tests are an example of functional tests. These tests allow experts to evaluate the person's readiness before participation in sports or during rehabilitation after injury or surgery by evaluating the functional status and the level of dynamics of the person in the basic movement patterns [17] . These screening tests, as part of a comprehensive evaluation, help specialists to have unique, specific and functional physical programs for athletes or active people [18]. Therefore, the use of the functional movement test is suggested as a way to reduce the possibility of injury and increase sports performance, and despite the lack of sufficient scientific evidence, this test has become common among coaches and athletes. However, the way and extent of its relationship with other functional tests have not been clearly defined, and therefore, important questions about the importance and utility of this test in the prevention of sports and musculoskeletal injuries remain unanswered. To answer these questions, a number of researches have investigated the relationship between functional movement screening test (FMS) and physical fitness factors. But due to various reasons such as the newness of this test and the lack of research on this test, so far researchers have not been able to definitively understand the role of this test in preventing sports injuries and its relationship with other valid tests, according to the results of such research. Therefore, more research in this field is necessary. Sports are particularly important, one of which is the functional movement screening test, which is worth choosing and paying attention to. The functional movement screening test (FMS) has been reported as one of the ways to diagnose and prevent sports injuries [19]. The FMS test is a tool that has the ability to determine the probability of an athlete's injury. This test examines the condition of the athlete by observation [19]. (FMS) consists of seven tests to check movement patterns that athletes need both acceptance movement and stability for their correct execution. These tests include shoulder mobility tests, deep squats, step forward test, direct and active lifting test or obstacle stepping test, trunk swimming test, rotational swimming test) [19]. Completing these 7 tests is scored from the total of these seven tests and the individual's score is calculated from a maximum of 21. The scoring method is that each of the 7 tests has 3 points. If the movement pattern is done correctly, the person gets 3 points. If the test is accompanied by compensatory movements, a score of 2 will be recorded for the athlete, and if the person cannot perform the movement completely, a score of 1 will be recorded for him, and if the athlete feels pain while performing the movement pattern, he will receive a score of zero.) [19]. It should be noted that research on the FMS test has not been extensive. To check the role of the test (FMS) in avoiding injuries.

Considering the fact that the tests conducted in this hypothesis, the results showed that there is a negative and relatively weaker significant correlation between the overall scores of the FMS test and the DASH questionnaire. Therefore, there was a significant relationship between the test among female (amateur) badminton players

<u>. Discussion and conclusion about the research hypothesis</u>

In this part, the significant reasons of communication in the present research are investigated. The results obtained from this research were compared with the results of other similar researches conducted abroad and inside the country, and the related situations were discussed around these results. The theoretical foundations related to performance tests indicate the importance of the role of this test in preventing sports injuries, which, based on these principles, pre-season screening has become very common among athletes and coaches in recent years. However, few studies have been conducted in this area, and fewer have been conducted to determine the relationship between these tests and other functional tests. In order to answer these questions and to promote the use of such performance tests in athletes of different disciplines, researchers have deemed it necessary to conduct more studies in this field. According to the gaps in the literature on the topic under study, the researcher in this research investigated the relationship between the scores of the functional movement screening test (FMS) and upper limb disability (DASH) among female (amateur) badminton players. the payment. Also, the results showed that there is a negative and relatively weak significant relationship between the overall score of the FMS test and functional disability of the upper limbs (DASH). This means that the lower a person scores in the questionnaire, the higher the score in the FMS test, and vice versa. In general, the results of the research showed that there was a significant relationship between the components of the FMS test and upper limb disability (DASH) in female (amateur) badminton players. Various internal factors make athletes prone to injury. These factors include the inappropriate ratio of strength and endurance of positive and negative aspects, structural abnormalities, gender, level of preparation before the season and history of injury [20]. have been identified as effective in injuries [20]. First, the factors related to the increase in the risk of injury (risk factors) should be identified [21]. Some of the ways to avoid injury is to identify the common injuries in sports and the risk factors that cause that injury [22]. In the articles published in the years Recently, researchers have identified two methods to avoid sports injury to prevent the possibility of injury in many sports held in the Olympics [23].

Discussing the relationship between the FMS test and the DASH questionnaire

Questionnaire (DASH) is a reliable tool that examines the health of the upper limbs. But so far, it has been used less in previous researches, and especially in amateur athletes, less research has investigated the health of the upper limbs and shoulders of amateur athletes using the DASH questionnaire. The results of this research are based on the hypothesis that between FMS It is related to upper limb function disability index, it supports .In the review of the research literature, it has been determined that most of the studies have focused on the validity and reliability of this questionnaire in different societies, and less studies have focused on the correlation of this questionnaire with other screening tests. The use of this questionnaire has been investigated in different injuries and the results of the studies have shown that different muscle injuries can be effective in the overall score of this questionnaire. DASH is a valid tool that examines upper limb health. But so far, it has been less used in previous research, and especially in amateur athletes, less research has been done to examine the health of the upper limbs and shoulders of non-competitive athletes using the DASH questionnaire. Therefore, it seems necessary to use valid tests so that we can examine the physical health of these people along with competitive athletes. Several studies are mentioned below .Ali H. Al-Nahadi (2021) Objective: To realistically investigate the psychometric properties of the Arabic DASH in patients with musculoskeletal disorders of the upper limbs. Materials and methods Participants with musculoskeletal disorders of the upper limbs (N=109) were selected using available sampling and They completed the Arabic DASH, Numerical Pain Rating Scale, Global Assessment of Functioning, and the 36-item RAND Health Survey in two experimental sessions (2 to 7 days apart). . Arabic DASH's structural validity, internal consistency, floor and ceiling effect, test-retest reliability, measurement error, and construct validity were investigated. The results of exploratory factor analysis showed an underlying factor of Arabic DASH. The Arabic DASH had a Cronbach's alpha of 0.90 and an ICC2.1 of 0.91, indicating excellent internal consistency and test-retest reliability. None of the participants reached the minimum or maximum score. The standard error of measurement of the scale and the minimum detectable change were 7.0 and 16.3. Five of the six pre-defined construct validity hypotheses were confirmed by the results. The result of DASH Arabic is a unidimensional scale with excellent internal consistency, test-retest reliability and acceptable measurement error. The Rapid Arabic DASH is a valid and reliable outcome measure that can be used in Arab-speaking countries with Arab patients suffering from various upper limb activity limitations and symptoms. [24]. Naser et al. (2016) Materials and methods Participants were 139 patients with various upper limb conditions who completed DASH-Arabic at baseline, 2 to 5 days later, and 30 to 36 days later. Participants completed demographic information forms, the SF-36, and the VAS at baseline and the Global Rating Scale of Change at the first and second follow-ups. The results of Cronbach's alpha of DASH-Arabic was 0.94. Test-retest reliability was excellent with an ICC of 0.97. SEM was 3.50 and MDC95 was 9.28. The construct validity of DASH-Arabic with SF-36 subscales and VAS scores ranged from 0.32 to 0.57. All were statistically significant (p50.001). The effect size (ES) for DASH-Arabic was 1.39 and the mean standardized response was 1.51. The area under the curve was 0.82 (95% CI ¼ 0.72-0.92, p50.001). The optimal cut-off for improvement was a difference of 15 DASH points. Conclusion DASH-Arabic is a reliable, valid, and responsive upper extremity outcome measure for patients whose first language is Arabic. It can be used to document patient status and outcomes and support evidence-based practice. [25]. Samia Sohrabi Renani et al. (2014) Materials and methods: In this study, 136 female student athletes with an average age of 20.11 2 2.23 years, an average height of 165.04 37 5.37 cm, an average weight of 56.60 6.90 kg without a history of musculoskeletal injury (<last) month) participated. From the functional motor screening test (shoulder motion tests, smooth and active leg raising, Swedish swimming stability test, turning stability, stepping forward in a line, full squat, and stepping on the hurdle) as an evaluation tool in prevention of sports injuries and using three consecutive distance jump tests to evaluate upper extremity function, Davis test for lower extremity function, balance error score test (BESS) to evaluate static balance, and Y-adjusted balance test to evaluate dynamic balance. arm (DASH), Owsestry Assessment, HOOS Assessment (KOOS), KOOS Injury and Ankle Ability Assessment (FAAM) questionnaires were used to evaluate joint function. To check the relationship between the variables, Pearson's correlation coefficient was used at a significance level of $p \geq 0.05$. Findings: The results showed that there is a significant relationship between the functional movement screening test score and the three-step jump test (0.005). P = 0.242 r =) There is also a significant relationship between the score of this test and the static balance test (r = 0.363) (p = 0.001) and the dynamic balance test (r = 0.24) (08/08). 0 = p). Also, there is a difference between the scores of arm disability evaluation questionnaires (p = 0.001 = 0.219), back disability (r = 0.252 = 0.002), hip disability (r = 0.322 = 0.001, p = 0.001) There is a significant relationship between knee injuries (r = r). 0.283 p = 0.001) and ankle joint ability (r = 0.274 p = 0.001) with functional movement screening test. [26]. Considering the fact that the tests conducted in this hypothesis, the results showed that there is a negative and relatively weaker significant correlation between the overall scores of the FMS test and the DASH questionnaire. Therefore, there was a significant relationship between the test among female (amateur) badminton players.

Conclusion

- Considering that the results of the FMS functional movement test have been related to upper limb functional tests and upper limb disability among amateur athletes, although with a relatively low negative rate, this test can be used as a convenient, cheap and fast tool in screening athletes. and can provide a report of the risk of injury to coaches and athletes.
- It seems necessary to choose suitable tests for athletes to prevent sports injuries from coaches and sports experts.
- And can effectively reduce the cost of treatment and improve the level of exercise.

Therefore, based on the results of this study, it can be said that although the test has been introduced as an assessment tool for injury prevention. However, its association with other functional tests and some physical factors has not been studied.

Recommendation

- According to the results of this study, it can be said that the functional motor screening test (FMS) as a reliable test can be used by coaches, athletes and the medical team of athletes prone to injury.

• Considering the significant relationship between the DASH questionnaire and the overall score of the FMS test, this questionnaire can be used to identify and diagnose people with upper limb injuries.

• Examining the relationship between the components of the functional movement test separately with the performed tests.

• Conducting a similar research using the shoulder arm hand rehabilitation questionnaire in other cities in Iran.

• Conducting similar research on amateurs in other cities in Iran.

• Examining the relationship between the functional movement test and other functional tests.

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