How Functional Movement Screening Scores Correlate to Y-Balance Scores

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Introduction

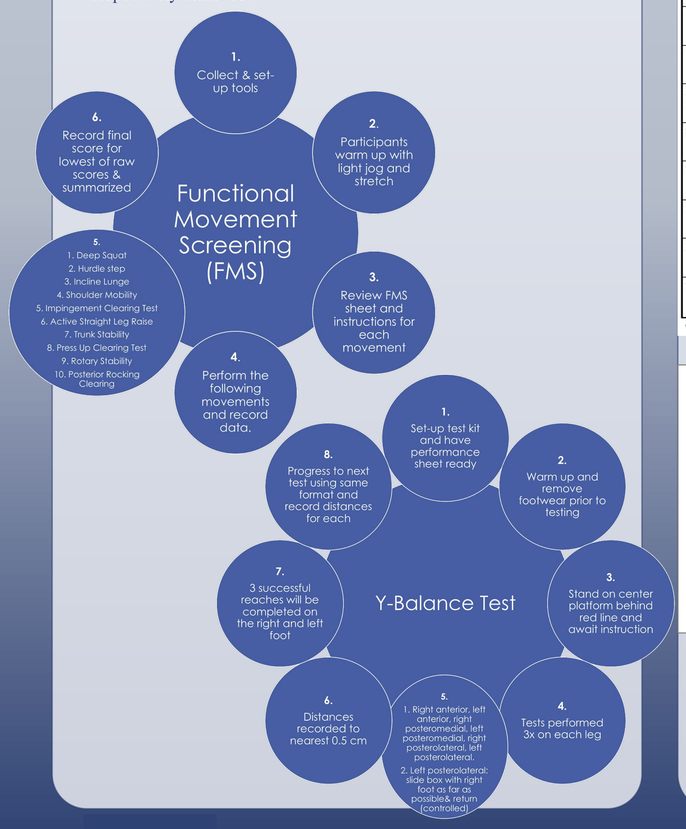
The Functional movement screening test (FMS) and the Y-balance test (YBT) are both assessments that are said to predict injury risk among whatever sample is being observed. The FMS test is a series of movements that are assessed based on the individual's ability to complete a specified movement without alterations in balance and form. This test includes a variety of movements that cover the overall mobility of the entire body. It is said to identify "functional movement impairments and asymmetries" (Bardenette et al. 2015). These criteria can help identify the injury risk of the individual being assessed.

The YBT is also said to determine injury risk among the sample being assessed. This test specifically is said to determine the injury risk of the lower extremities. This test uses three different movements and is said to determine "limits to stability and asymmetrical balance", which in turn, similar to the FMS, are used to determine injury risk (Shaffer et al. 2013).

Both the FMS and the YBT serve the same purpose, so it would be expected that the scores of both tests should have a strong positive correlation. The purpose of this study is to determine the level of correlation between the FMS and YBT assessments. The literature says that these two assessments have a moderately positive correlation (Koçak et al. 2019). The hypothesis of this study is that the FMS and YBT assessments will have a moderately positive correlation.

Methods

- FMS is used to to show functional movement deficiencies. FMS aims to identify imbalances in mobility and stability.
- The Y-Balance Test is used to measure dynamic balance.
- The duration for testing lasted approximately two days. The FMS test was performed after a ten minute warm-up was completed. After twenty-four hours, the YBT was respectively performed the same as FMS.
- Independent Variable = FMS and Y-Balance Test
- Dependent Variable = Correlation data between the two tests
- The data collected is between both tests and the quantitative ratios respectively achieved.



Results

The first correlation shows the Y-Balance test results, which consist of Anterior (R/L), Posteromedial (R/L), Posterolateral (R/L), and Composite scores (R/L). These results showed all subjects were either at or above average. The second correlation table shows the FMS test results which consist of deep squat, hurdle step, inline lunge, shoulder mobility, impingement clearing test, active straight-leg raise, trunk stability push up, press-up clearing test, rotary stability, and posterior rocking clearing test. These results also show all subjects were either at or above average.

Correlations

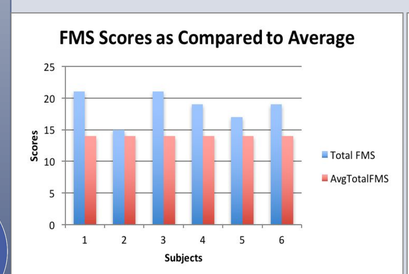
		AnteriorR	AnteriorL	PosteromedialR	PosteromedialL	PosterolateralR	PosterolateralL	CompositeR	CompositeL	LimbLengthR
AnteriorR	Pearson Correlation	1	.924**	.554	.747	.716	.585	.837*	.785	.195
	Sig. (2-tailed)		.008	.254	.088	.109	.223	.038	.064	.712
	N	6	6	6	6	6	6	6	6	6
AnteriorL	Pearson Correlation	.924**	1	.700	.853*	.877*	.705	.918**	.881*	.245
	Sig. (2-tailed)	.008		.122	.031	.022	.118	.010	.020	.640
	N	6	6	6	6	6	6	6	6	6
PosteromedialR	Pearson Correlation	.554	.700	1	.956**	.913*	.926**	.767	.756	.580
	Sig. (2-tailed)	.254	.122		.003	.011	.008	.075	.082	.228
	N	6	6	6	6	6	6	6	6	6
PosteromedialL	Pearson Correlation	.747	.853*	.956**	1	.927**	.908*	.833*	.823*	.579
	Sig. (2-tailed)	.088	.031	.003		.008	.012	.040	.044	.228
	N	6	6	6	6	6	6	6	6	6
PosterolateralR	Pearson Correlation	.716	.877*	.913*	.927**	1	.855*	.935**	.884*	.337
	Sig. (2-tailed)	.109	.022	.011	.008		.030	.006	.019	.513
	N	6	6	6	6	6	6	6	6	6
PosterolateralL	Pearson Correlation	.585	.705	.926**	.908*	.855*	1	.806	.877*	.348
	Sig. (2-tailed)	.223	.118	.008	.012	.030		.053	.022	.500
	N	6	6	6	6	6	6	6	6	6
CompositeR	Pearson Correlation	.837*	.918**	.767	.833*	.935**	.806	1	.964**	.062
	Sig. (2-tailed)	.038	.010	.075	.040	.006	.053		.002	.907
	N	6	6	6	6	6	6	6	6	6
CompositeL	Pearson Correlation	.785	.881*	.756	.823*	.884*	.877*	.964**	1	.019
	Sig. (2-tailed)	.064	.020	.082	.044	.019	.022	.002		.971
	N	6	6	6	6	6	6	6	6	6
LimbLengthR	Pearson Correlation	.195	.245	.580	.579	.337	.348	.062	.019	1
	Sig. (2-tailed)	.712	.640	.228	.228	.513	.500	.907	.971	
	N	6	6	6	6	6	6	6	6	6

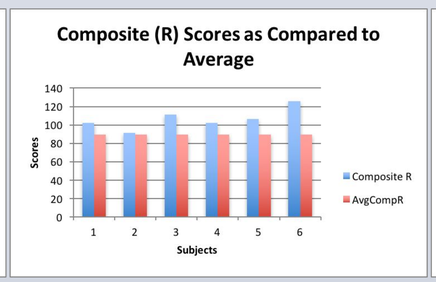
**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

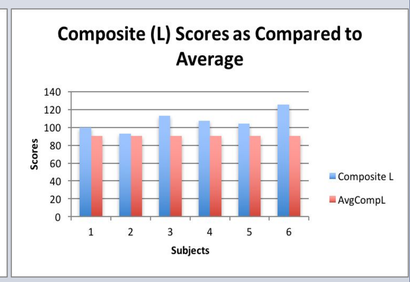
Correlations

		DeepSquat	HurdleStep	InlineLunge	ShoulderMobility	ImpingementTest	ActiveStraightLegRaise	TrunkStability	PressUpClearing	RotaryStability	PosteriorRocking	Total
DeepSquat	Pearson Correlation	1	-.316	-.158	.250	.a	.a	.000	.250	.250	.a	.221
	Sig. (2-tailed)		.541	.765	.633	.	.	1.000	.633	.633	.	.674
	N	6	6	6	6	6	6	6	6	6	6	6
HurdleStep	Pearson Correlation	-.316	1	.800	.632	.a	.a	.878*	-.316	-.316	.a	.768
	Sig. (2-tailed)	.541		.056	.178	.	.	.021	.541	.541	.	.074
	N	6	6	6	6	6	6	6	6	6	6	6
InlineLunge	Pearson Correlation	-.158	.800	1	.316	.a	.a	.878*	.316	.316	.a	.908*
	Sig. (2-tailed)	.765	.056		.541	.	.	.021	.541	.541	.	.012
	N	6	6	6	6	6	6	6	6	6	6	6
ShoulderMobility	Pearson Correlation	.250	.632	.316	1	.a	.a	.463	-.500	-.500	.a	.552
	Sig. (2-tailed)	.633	.178	.541		.	.	.355	.312	.312	.	.256
	N	6	6	6	6	6	6	6	6	6	6	6
ImpingementTest	Pearson Correlation	.a	.a	.a	.a	.a	.a	.a	.a	.a	.a	.a
	Sig. (2-tailed)	.	.	.	.	.	.	.	.	.	.	.
	N	6	6	6	6	6	6	6	6	6	6	6
ActiveStraightLegRaise	Pearson Correlation	.a	.a	.a	.a	.a	.a	.a	.a	.a	.a	.a
	Sig. (2-tailed)	.	.	.	.	.	.	.	.	.	.	.
	N	6	6	6	6	6	6	6	6	6	6	6
TrunkStability	Pearson Correlation	.000	.878*	.878*	.463	.a	.a	1	.000	.000	.a	.920**
	Sig. (2-tailed)	1.000	.021	.021	.355	.	.	.	1.000	1.000	.	.009
	N	6	6	6	6	6	6	6	6	6	6	6
PressUpClearing	Pearson Correlation	.250	-.316	.316	-.500	.a	.a	.000	1	1.000**	.a	.221
	Sig. (2-tailed)	.633	.541	.541	.312	.	.	1.000	.	.000	.	.674
	N	6	6	6	6	6	6	6	6	6	6	6
RotaryStability	Pearson Correlation	.250	-.316	.316	-.500	.a	.a	.000	1.000**	1	.a	.221
	Sig. (2-tailed)	.633	.541	.541	.312	.	.	1.000	.000	.	.	.674
	N	6	6	6	6	6	6	6	6	6	6	6
PosteriorRocking	Pearson Correlation	.a	.a	.a	.a	.a	.a	.a	.a	.a	.a	.a
	Sig. (2-tailed)	.	.	.	.	.	.	.	.	.	.	.
	N	6	6	6	6	6	6	6	6	6	6	6
Total	Pearson Correlation	.221	.768	.908*	.552	.a	.a	.920**	.221	.221	.a	1
	Sig. (2-tailed)	.674	.074	.012	.256	.	.	.009	.674	.674	.	
	N	6	6	6	6	6	6	6	6	6	6	6

*. Correlation is significant at the 0.05 level (2-tailed).







The results for the FMS test show all movements including Deep Squat, Inline Lunge, Shoulder, Mobility, Impingement Clearing Test, Active Straight-Leg Raise, Trunk Stability Push Up, Press-Up Clearing Test, Rotary Stability, Posterior Rocking Clearing Test. The results show completion from three males and three females. The total scores for each subject of the FMS test consisted of 21, 15, 21, 19, 17,and 19. The composite scores for each individual for the Y-balance test in the same order consists of 102.39(R) 99.97(L), 91.13(R) 92.95(L), 111.07(R) 112.59(L), 102.17(R) 107.37(L), 106.21(R) 104.16(L), 126(R) 125.3(L). The average total FMS scores range between 13-15. The average composite right scores is approximately 89.75. The average composite left scores is approximately 90.35.

Discussion

The norms for exercise, rest, and variables are all neutral in relation to changes. Exercise parameters are conducted to run the same throughout testing. Rest is also the same between participants being twenty-four hours of time. The variables are congruent to testing.

Results found in the three bar graphs were averages compared to the participants included in this study. Bar graph 1 are the FMS scores in relation to average scores. Bar graph 2 & 3 show the results between participants and average scores of the YBT.

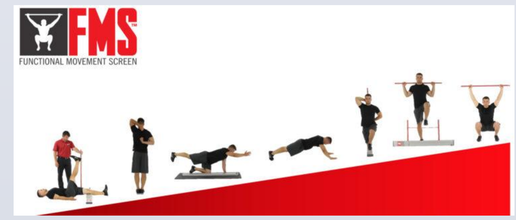
Discrepancies can be related back to the FMS scoring parameters and the leniency at which scores were given. As for YBT, scoring were correctly calculated.

FMS is designed to identify movements that increase the risk for injury and insufficient movement reducing performance values.

YBT is designed as a simple and reliable test to measure a person's risk for injury based on dynamic balance.

Conclusion

This lab was conducted to determine the correlation between FMS scores and YBT scores. The tests were conducted over a two day period with the FMS being done on the first day and the YBT being done of the second day. This allowed for the subjects to be rested between the two tests. The lab preformed confirmed the hypothesis presented by the literature and our group. This, in turn, means that the data provided has a moderately positive correlation. The main error found within this lab is the error in the scoring of FMS test.



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