Strength Evaluation System

University of Jordan

Lab Human

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Team

- Alaa Saqr 0201373
- Saleem BOURI 0202428
- Bara Edris 0206169
- Yazan Othman 0195843
- Nour eddin zwayed 0199286

❖ Objectives:

This experiment is designed to Measure isometric strength of the body muscles in a standing position; using the Jackson strength evaluation system a simple and accurate method of measuring maximum body strength. In this experiment, we are testing the strength of the body muscles in two different positions at a duration of 3 seconds first each trial.

Flexibility is described as the ability to bend without sustaining any injury.

Muscles are strongest nearest at the beginning of contraction and weaken as they extend.

❖ Background:

Strength is the ability of muscles to work against resistance to generate maximal muscle force. There are two natures for the body strength: static and dynamic.

Static Strength: The maximum voluntary muscular exertion (contraction) of a body part (e.g., the arms, the legs, or the back) in a restrained position without movement.

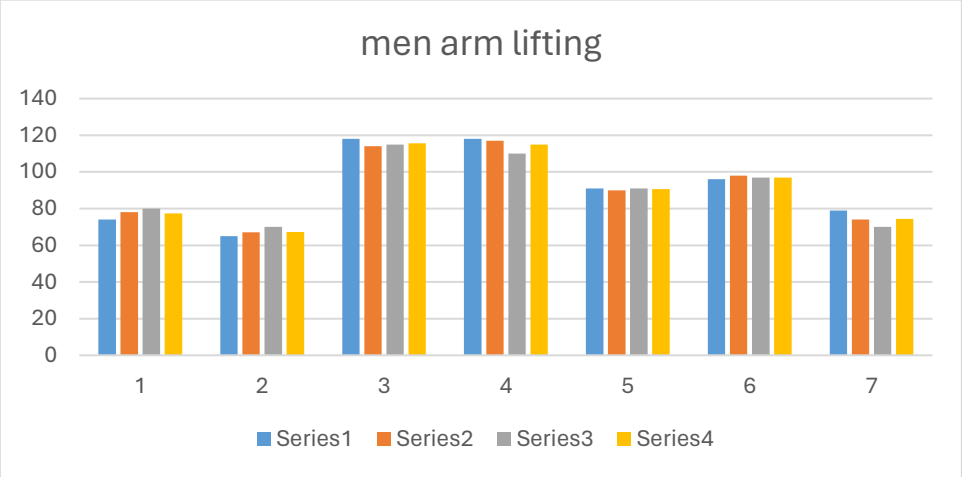
In this experiment we measure static strength of the arm lifting muscles in a standing position (neutral); using the Jackson strength evaluation system with a load cell attached to platform.

❖ Equipment:

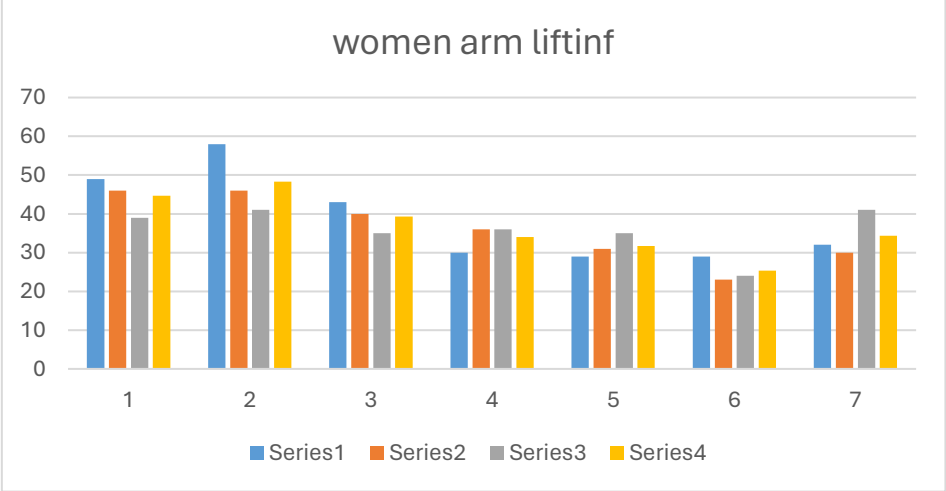
In this experiment we used the a precise and accurate device (electronic load cell) accompanied with a portable tablet that helps conduct the test more efficiently.

❖ Tables:

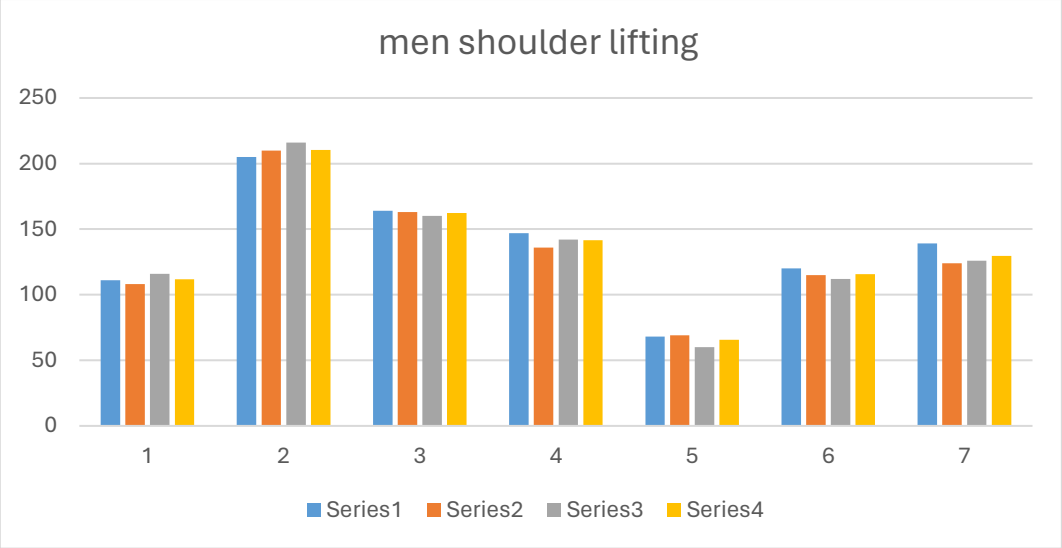
arm lifting	avg1	avg2	avg3	avg avg
1	74	78	80	77.33333
2	65	67	70	67.33333
3	118	114	115	115.6667
4	118	117	110	115
5	91	90	91	90.66667
6	96	98	97	97
7	79	74	70	74.33333



arm lifting	avg1	avg2	avg3	avg avg
1	49	46	39	44.66667
2	58	46	41	48.33333
3	43	40	35	39.33333
4	30	36	36	34
5	29	31	35	31.66667
6	29	23	24	25.33333
7	32	30	41	34.33333



shoulder lifting	avg1	avg2	avg3	avg avg
1	111	108	116	111.6667
2	205	210	216	210.3333
3	164	163	160	162.3333
4	147	136	142	141.6667
5	68	69	60	65.66667
6	120	115	112	115.6667
7	139	124	126	129.6667



sholder lifting	avg1	avg2	avg3	avg avg
1	60	71	69	66.66667
2	71	71	69	70.33333
3	45	52	53	50
4	50	52	55	52.33333
5	60	78	90	76
6	58	52	40	50
7	43	42	55	46.66667

❖ Procedure:

- A person must stand in a neutral posture. Holding the metal bar using face-up palms. Feet must be shoulder width apart. Elbows at 90 degrees. While adjusting the metal bar to the right height for each student.
- The purpose of this test is to measure the arm lifting strength of the body. The person is not allowed to lean back or grasp the handle in the ulnar direction.
- The force is correctly exerted by lifting with the hand palm.
- The person must grip the handle with full strength for the adjusted time on the Jackson unit load cell (3 sec).
- The peak and the average values will be shown on the tablet in (kg) for each student in each trial.

❖ Sources of Error:

- 1- Inconsistent Posture: Despite instructions, some participants may not maintain a neutral posture throughout the test, potentially affecting the accuracy of the results.
- 2- Variability in Grip Technique: Participants may apply varying grip techniques, leading to inconsistencies in force exertion and measurement accuracy.
- 3- Equipment Calibration: Calibration errors in the Jackson Strength Evaluation System could result in inaccurate force measurements, impacting the reliability of the data.
- 4- Fatigue Effects: Fatigue may accumulate over multiple trials, leading to decreased performance and potentially skewing the results towards the end of the testing session.

❖ Conclusion:

The Jackson Strength Evaluation System was designed to conduct force tests for a variety of users, including athletes, patients, and other groups. Its purpose is to test a person's ability to perform these forces without subjecting them to direct force, which prevents muscle fatigue or rupture. Additionally, the results of our experiment showed that males exhibited higher percentages of strength than females. Men should perform the tasks that call for strength to lift and pull in this manner; male athletes performed better than other athletes, therefore it is safe to say that they are the most suited for these kinds of duties.