

EVALUATION OF FIREFIGHTERS' FUNCTIONAL MOVEMENT



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Introduction & Background:
According to a previous research, firefighters have a higher rate of being overweight, or obese, than the general population. These higher risks predict mortality, morbidity, short and long medical costs. Various programs in conjunction with acute care will allow for athletic trainers to utilize a variety of skills and improve the quality of health care provided for firefighters while reducing the fiscal bottom line.

Firefighters who exercise regularly on-duty were found to have nearly half the odds of suffering a non-exercise-related injury compared with those who do not regularly exercise on duty. One third of injuries reported among firefighters were the result of physical training or exercise., which are most communally sprains and strains.

Purpose:
To determine the effectiveness of an athletic trainer prescribed fitness regime based on athletic training functional assessment on firefighter fitness testing performance.

Methods:
16 current firefighters (14 male, 2 female) were recruited to participate in this study. Participants were informed of the study, signed an informed consent. Data was collected on height, weight, blood pressure, pulse, respirations. The sit and reach was performed after the participants removed their shoes. They sat on the floor with their legs stretch out in front with the knees straight and feet flat on the test box. They were asked to slowly and steadily slide the ruler up as far as they went. This was repeated three times. Each participant then had their goniometric measurements taken for both limbs. A trained clinician placed the participant in each motion's neutral position and then asked them to actively go as far as they could. Using a digital inclinometer, the range of motion was noted. This was performed 3 times per side for the following joints: hip (flexion, extension, internal rotation, external rotation), knee (flexion), ankle (dorsiflexion, plantar flexion), and shoulder (flexion, extension, abduction, internal rotation, external rotation). For the sit and reach and goniometric measurements, averages were calculated. Means and standard deviations were calculated for all values. Paired samples t-tests were utilized to compare range of motions bilaterally with an alpha of 0.05.

Results:

measure	Mean	Std. deviation
Sit and reach	21.46	10.12
Hip flexion (R)	90.44	16.22
Hip flexion (L)	94.40	10.89
Hip extension (R)	36.65	10.81
Hip extension(L)	35.60	7.87
Hip internal rotation(R)	35.35	7.76
Hip internal rotation(L)	34.85	8.43
Hip external rotation (R)	59.66	40.33
Hip external rotation (L)	49.04	25.95
Hip abduction (R)	64.73	16.41
Hip abduction (L)	64.56	15.92
Hip adduction (R)	23.97	30.99
Hip adduction(L)	24.04	30.60
Knee flexion(R)	108.40	23.92
Knee flexion (L)	109.63	22.81
Ankle dorsiflexion(R)	28.21	7.92
Ankle dorsiflexion(L)	25.88	7.03
Ankle planter flexion(R)	50.98	11.46
Ankle planter flexion(L)	50.54	13.60
Shoulder flexion(R)	151.88	18.15
Shoulder flexion(L)	144.50	13.79
Shoulder extension(R)	72.42	10.61
Shoulder extension(L)	94.67	69.28
Shoulder abduction(R)	123.83	17.37
Shoulder abduction(L)	112.06	17.02
Shoulder internal rotation(R)	89.04	15.30
Shoulder internal rotation (L)	85.35	12.16
Shoulder external rotation(R)	92.79	20.99
Shoulder external rotation (L)	88.67	13.34

measurement((pair: L&R)	t value	sig
Shoulder external rotation	-0.79	0.44
Shoulder internal rotation	-0.83	0.42
Shoulder abduction	-2.8*	0.04*
Shoulder extension	1.7*	0.23
Shoulder flexion	-2.6*	0.02
Ankle planter flexion	-0.26	0.80
Ankle dorsiflexion	-1.3*	0.22
Knee flexion	0.69	0.50*
Hip adduction	0.03	0.98
Hip abduction	0.07	0.94
Hip external rotation	-1.2*	0.27
Hip internal rotation	-0.35	0.73
Hip extension	-0.36	0.72
Hip flexion	1.0*	0.31

Conclusion:
After deeply looking through the data collected, the results have shown that firefighters not only have a limited hip motion, but also have a limited shoulder motion. Additionally, the data have put a light spot on a significant difference (about 20%) between the left and right side at the shoulder. Thus, we need to address limitations not only as just the shoulder but individuals limbs.
The research results will not only minimize the acute and chronic injuries of firefighters daily life, but also minimize the financial burden associated with time loss or workman's' compensation claim.

Acknowledgement:
Special thanks to Dr. Nedra Wilson for organizing OKStars, to Dr. Volberding, Emily Madrak, and Steve Lintern for their support and guidance through this process, and to all of the research participants.

