Feasibility and Validity of Functional Movement Screen in Assessing Postural Control of Operative Firefighters Aged 22-59, Anne Punakallio, PhD; Miia Wikström, MSc; Sirpa Lusa, PhD, Finnish Institute of Occupational Health, Helsinki, Finland

BACKGROUND AND AIM:

Roof work, working in moving emergency vehicles and rescuing victims in changeable environments are typical tasks in fire and rescue work, in which good postural and movement control are critical for safe and efficient work performance. We examined the feasibility and work- and health-related validity of the functional movement screen (FMS) assessing postural and movement control as part of the evaluation of the work ability of operative firefighters.

METHODS:

The participants comprised 97 male firefighters in the age groups of 20–29, 30–39, 40–49 and 50–59 years (mean±SD 39.9±10.6). The FMS included seven tests with different movement patterns: deep squat, hurdle step, inline lunge, shoulder mobility, active straight-leg raise, trunk stability push-up and rotary stability. The participants performed each test one to three times, and scored 0–3. The final score was the sum of the seven items. Work-related dynamic balance was measured by a functional test in which the participants wore fire-protective clothing and equipment. The participants also performed the modified agility T-test. A questionnaire elicited perceived work ability, balance and musculoskeletal pain (MSP) in the last year. Age-adjusted Spearman's correlation analysis was also used.

RESULTS:

The FMS was feasible for the different age groups and fitness levels of the firefighters, and took about 30 minutes. Its mean (range) was 14.2 (7.0-21.0) and it was significantly related to age ($r=-.64$, $p<.0001$). Good FMS results were connected with efficient performance in the dynamic balance test ($r=-.19$, $p=.064$) and associated significantly with fast performance in the agility T-test ($r=-.23$, $p=.023$). Good perceived work ability in relation to the physical demands of fire and rescue work, as well as perceived balance in relation to the balance demands of work were significantly associated ($r=.26$, $p=.009$, $r=.28$, $p=.005$, respectively) with better FMS results. Poor FMS results were related to previous MSP ($r=-.26$, $p=.011$) in several body sites.

CONCLUSIONS:

The FMS score was strongly related to age, perceived and measured work-related balance, agility, work ability and the number of MSP sites among operative firefighters. The test was suitable for firefighters of different ages, and took a reasonable amount of time when performed by a well-qualified tester. Our results support the work- and health-related validity of the use of FMS among operative firefighters. Peate et al. (2007) have shown a correlation between past musculoskeletal injury and FMS score among firefighters. However, a longitudinal study is needed to evaluate the predicted value of FMS in respect to work ability and MSP. Our results also support the feasibility of FMS as a part of the evaluation of the physical work performance of operative firefighters. For early prevention of decreased work ability, we recommend that a qualified tester perform FMS during firefighters´ periodic health examinations.