

Oosch, my hand! Is the identical hand intensive work task risk assessed equally in Swedish women and men?

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Why is risk assessment important?



Source: National Chicken Council. | GAO-10-337
Poultry workers cut and trim chicken as it moves along a line. According to a worker advocacy group, poultry workers may make specific cuts thousands of times each shift.

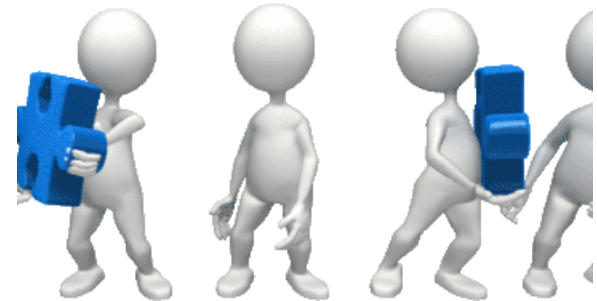


Exposure assessment in hand-intensive work

- Hand Activity Threshold Limit Value[®] (Latko 1997)
- Ratings
 - Hand activity 0-10
 - Force - Borg CR-10

Aim

- To investigate if women and men in an identical hand-intensive work task are equally assessed in self and observer ratings of hand activity and force levels
- To investigate if any gender differences of the ratings of hand activity and force are related to grip strength and anthropometrics of the forearm and finger abduction.



Method

Participants - workers, N=56 (n=28/28 women/men)

- Woman-man pairs - identical hand intensive work tasks (n=18)
- Grip strength, forearm length, finger abduction
- Ratings:
 - self- and observer rated; hand activity and force
- Video

Participants – observers, ergonomists (n=4) , two pairs, woman-man

RESULTS 1. Grip strength, forearm length and finger abduction

Variables	Women ¹	Men ¹	p-value ²
Right grip, JAMAR, kg	35.5 (6.8)	58.7 (10.0)	<0.001
Right forearm length, cm	43.9 (2.1)	48.5 (2.2)	<0.001
Right finger abduction, cm	19.8 (1.3)	22.1 (1.6)	<0.001

¹Mean (SD), ²paired samples test

RESULTS 2. Self- and observer ratings of hand activity and force - women compared to men

			Unadjusted	
	Women ¹	Men ¹	Diff [95%CI]	p-value ²
Hand activity self-rating	5.6 (1.6)	6.2 (1.4)	-0.6 [-1.22, 0.04]	0.07
Force self-rating	3.1 (1.4)	3.3 (1.4)	-0.2 [-0.89, 0.50]	0.57
Hand activity observer	5.0 (1.9)	4.9 (2.0)	0.1 [0.57, 0.79]	0.75
Force observer	3.9 (2.7)	3.1 (1.8)	0.8 [0.26, 1.42]	0.01

¹Mean [SD], ²Paired samples t-test

Self- and observer ratings of hand activity and force
- women compared to men, adjusted for grip strength, forearm
length and finger abduction

	Adjusted	
	Diff [95%CI]	p-value ¹
Hand activity self-rating	0.4 [-0.98, 1.77]	0.57
Force self-rating	0.2 [-1.23, 1.54]	0.82
Hand activity observer	-0.1 [-1.84, 1.61]	0.90
Force observer	1.7 [0.05, 3.29]	0.04

¹Linear mixed model

Results and Discussion

- Grips strength and size – **significant different** - similar others
- Self-rated hand activity, force and observer hand activity – not significant
 - Women rated lower - men higher.
 - Women's anthropometrics lesser, Identical work task/load in women-men
 - Similar others; Same time to *fatigue* in a repetitive pointing task in women and men
Slopeci et al. 2020, Srinivavasan et al. 2016
- Observer force rating – **significant difference between women and men**
 - Observers rated women higher – gender bias?
 - No studies on gender. Similar others; Higher accuracy for hand activity, lower for force ratings by observers Wurzelbacher et al., 2010, Lowe and Krieg 2009



Conclusion

In identical work tasks by women and men

- **Equal ratings** were found in workers' self-ratings in hand activity and force, and for observers' hand activity ratings ...
- ...workers' participation in hand activity and force, and observers' hand activity ratings may support equal ratings
- **Different ratings** were found in observers' force ratings...
- ...observers' force ratings may influence by gender bias
- The “true” value is unknown - need to compare ratings with objective methods.



Thank you!



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