Associations of muscular power and endurance to change of direction speed under two loading conditions among female police officers

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Purpose: Change of direction speed (CODS) is essential for law enforcement officers during many occupational tasks, such as when pursuing a suspect. Typically, these tasks are performed while in uniform and while wearing duty equipment weighing up to an average of 10kg . It could be expected that greater strength and power would contribute to more effective task performance in loaded conditions. The purpose of this study was to determine the relationship between lower-body power and upper body muscular strength-endurance to a CODS task both with and without occupational load.

Methods: Forty-four (n=44, age: 27.09 ±7.25 yrs., Ht: 166.48 ± 6.88 cm; Wt.: 69.92 ± 13.69 kg) female police officers performed a standing long jump (SLJ), modified push-ups (MPU), and time to complete the Illinois Agility Test both unloaded (IAT) and while wearing a 10 kg vest (IATL). Completion times for the IAT and IATL were recorded to the nearest .01 sec.

Results: The results revealed significant moderate relationships between SLJ and IAT (r =-0.586, p < .001), as well as between SLJ and IATL (r =-0.567, p < .001). A low, but significant, relationship was also found between MPU and IATL (r =-377, p =.012). No significant relationship was observed between IAT and MPU (Table 1).

Conclusions: Female officers with greater lower-body power and upper-body strength endurance may have an advantage when performing the IATL; however, the MPU does not appear to significantly impact in the IAT. These results suggest that as occupational load increases, especially around the trunk, greater upper-body muscular strength and endurance become more important when performing essential job tasks that require short distance sprinting and direction changes (i.e., foot pursuits, seeking cover).

Table I: Relationships between Lower-body power, muscular strength/endurance, and

		Age	Ht	Wt	SLJ	PU	IAT	IATL
Age	Pearson's r	—						
	p-value	—						
HT	Pearson's r	-0.509†	—					
	p-value	< .001	—					
WT	Pearson's r	0.37†	0.292	—				
	p-value	0.013	0.054	—				
SLJ	Pearson's r	-0.475†	0.649†	0.134	—			
	p-value	< .001	< .001	0.384	—			
MPU	Pearson's r	.464**	-.244	.195	-.024	—		
	p-value	.002	.110	.204	.878	—		
IAT	Pearson's r	0.452	-0.355*	0.171	-0.586†	-.153	—	
	p-value	0.002**	0.018	0.268	< .001	.321	—	
IATL	Pearson's r	0.26	-0.28	0.023	-0.567†	-.377**	0.9†	—
	p-value	0.088	0.065	0.88	< .001	.012	< .001	—

$p \leq 0.05$ = *; $p \leq 0.01$ = **; $p \leq .001$ = †