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FUNCTIONAL SCREENING

The Functional Movement Screen as a predictor of police recruit occupational task performance

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Summary *Aim:* The aim of this study was to determine whether poor movement patterns impact on police recruit task performance.
Methods: Fifty-three volunteers were randomly selected from a pool of 173 police recruits attending basic recruit training. Relationships between movement performance, as measured by the Functional Movement Screen, and four occupational tasks were investigated.
Results: Eleven percent failed the marksmanship and baton strike assessments, 21% failed defensive tactics and 36% failed the tactical options assessment. Mean Functional Movement Screen score was 13.96 points (±1.99 points). Only the tactical options assessment approached a significant difference ($p = 0.077$) between pass/fail recruits. When Functional Movement Screen scores when graded as pass (14+) or fail (<14) again only the tactical options assessment approached significance ($p = 0.057$).
Conclusion: The results of this study suggest that a relationship between an officer's movement patterns and occupational performance, most notably choice of tactical options, may exist.

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Introduction

Occupational demands of tactical personnel, such as police officers, require the performance of daily duties that consist of dynamic tasks. These dynamic tasks can require movements like running, jumping, crawling, balancing, climbing, lifting, carrying, pushing, pulling, fighting and dragging, in unpredictable environments (such as rugged and hash terrains) often while the officer is wearing external loads (Blacker et al., 2013; Orr, 2007; Petersen and Smith, 2007). These external loads, which for a general police officer can equate to a weight of 10 kg and a specialist police officer over 20 kg (Blacker et al., 2013; Carlton et al., 2013), can consist of items such as protective armour, personal weapons and communication devices (Dempsey et al., 2013).

Performing these dynamic occupational duties can affect a police officer in a number of ways through imposing significant physiological stress like causing elevations in heart rate, oxygen consumption and heat production (Blacker et al., 2013; Sharkey and Davis, 2008). The addition of external load further influences the impact of dynamic occupational task performance, from reducing their physiological function (Perry and Koehle, 2013), task performance capability (Larsen et al., 2011) and ability to tolerate heat (Larsen et al., 2011), to increasing their energy expenditure while performing a given task (Hasselquist et al., 2008). The results of these impacts can in turn lead to decreases in the ability of the officer to mobilise over short explosive tasks (Treloar et al., 2011) and over tasks of longer durations (Drain et al., 2010). In addition, external load carriage is known to impair balance (Park et al., 2014), change gait patterns (running and walking) (Hasselquist et al., 2008; Park et al., 2014; Perry and Koehle, 2013), and influence postural stability (Park et al., 2014; Sell et al., 2013). Considering these occupational demands, it has been suggested that poor movement quality has the potential to impede occupational performance to the point of reducing performance or causing injury (Orr, 2007).

One means of identifying poor movement patterns is through the use of the Functional Movement Screen (FMS) tool. The FMS is an evaluation tool used to assess the fundamental movement patterns of an individual in a dynamic and functional capacity (Cook et al., 2006). The FMS consists of seven movement patterns that require elements of muscle strength, flexibility, range of motion, coordination, balance, and proprioception for successful completion (Cook et al., 2006; Kiesel et al., 2007). With poor execution of these elements associated with an increased risk of musculoskeletal injury (Cook et al., 2006), the FMS tool offers an approach to injury prevention and performance predictability by identifying an individual's functional limitations and/or asymmetries (Cook et al., 2006; Gribble et al., 2013; Kiesel et al., 2011; Kiesel et al., 2007; Perry and Koehle, 2013).

The use of the FMS as a predictor of injury forms one of the key tenants for its use within physically active populations (Cook et al., 2006). Previous studies have suggested that low FMS scores of $\leq$14 (out of a possible 21) have an association with musculoskeletal injuries in athletic (Chorba et al., 2010; Kiesel et al., 2007), general (Perry and Koehle, 2013; Schneiders et al., 2011) and tactical (Dempsey et al., 2013; Gribble et al., 2013; Lisman et al., 2013; O'Connor et al., 2011) populations. Kiesel et al. (2007) conclude that National Football League players with FMS scores $\leq$14 had an 11-fold increase in chance of injury in comparison with players with scores $>$14. These results were supported by Chorba et al. (2010). Schneiders et al. (2011) and Perry and Koehle (2013) both confirmed that a FMS score of $\leq$14 indicated an increased risk of injury within the general population while O'Connor et al. (2011) and Lisman et al. (2013) validated the use of the FMS score of $\leq$14 as a predictor of injury within tactical populations.

While evidence is available for the use of the FMS as a predictor of injury there is limited evidence that the FMS can predict performance. As the FMS assesses fundamental movement patterns of an individual in a dynamic and functional capacity, movement patterns typical of the occupational nature of police officers (Blacker et al., 2013; Carlton et al., 2013), the question arises whether this tool could be employed to assess occupational capability in tactical personnel. Therefore, the aim of this study was to investigate the relationship between (a) the quality of functional movement patterns (the independent variable assessed via the Functional Movement Screen instrument) and (b) each of four occupational police tasks (the four dependent variables) as demonstrated by police recruits.

Methods

Participants

A sample of 53 recruits, drawn from a pool of 173 police recruits, attending a police recruit training course provided the sample pool for this study. These recruits were undergoing fulltime training at the New South Wales (NSW) Police Academy. No demographic information on these recruits was available, however all recruits did meet the necessary entry requirements for age (a minimum of 18 years and 4 months of age), completed a health clearance from a General Practitioner and had a full medical assessment completed by an external provider. Inclusion criteria were a) the recruit was attending Session 2, police recruit training, b) the recruit had not attempted Session 2 previously and c) the recruit was able to complete the FMS and all occupational measures. The exclusion criterion for this study was a recruit currently suffering an injury.

Procedures

As part of their training process, 173 police recruits were divided into tutor groups by Academy staff who were blinded to the study. These tutor groups are smaller groups of approximately 20–30 recruits (depending on intake size) created for improved logistic coordination. Due to timetable limitations, two tutor groups were randomly selected by the researchers (via a hat draw) to complete the FMS, leading to a total of 53 police recruits completing the FMS. All recruits gave informed consent to study participation. Ethics approval for this research was granted by the Bond University Human Research Ethics Committee (RO1596).