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Published in:
Journal of Strength and Conditioning Research

DOI:
10.1519/JSC.0000000000004141

ASSOCIATIONS BETWEEN AGE AND JUMP PERFORMANCE AMONG SPECIAL WEAPONS AND TACTICS TEAM OPERATORS

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ABSTRACT

Lower-body power is essential for Special Weapons and Tactics (SWAT) unit operators when performing many occupational tasks, such as breaching, casualty extraction, and seeking cover.

PURPOSE: The aim of this study was to examine the relationship between age and vertical jump performance among multi-jurisdictional SWAT team members.

METHODS: Seventeen (n=17, age 35.5 ± 5.9 yrs; HT 181.5 ± 8.4 cm; BM: 96.2 ± 13.1 kg) male police officers belonging to a multi-jurisdictional SWAT unit participated in this study.

RESULTS: No significant relationship (r = .245, r2 = 0.05, p = 0.97) was found between age and VJ height among the officers. However, a strong positive correlation between age and ground contact time (r = .712, r2 = 0.50, p = 0.001) was found.

CONCLUSION: Based on the observations from this study, it appears that, although vertical jump height is not affected by age, there are differing mechanisms utilized to produce power vertically. This should be addressed by those working with tactical training programs.

INTRODUCTION

- Lower-body power is essential for Special Weapons and Tactics (SWAT) unit operators when performing many occupational tasks, such as breaching, casualty extraction, and seeking cover.
- Ordinarily, the demographics of a SWAT team often consist of a diverse age range. SWAT teams must be able to adequately perform their occupational duties in order to successfully complete their mission, regardless of age.
- In general, several of the occupational duties relating to law enforcement officers have been reported to have an association with an individual's ability to produce muscular strength and power.
- However, the relationships between age and lower-body power within this population (multi-jurisdictional SWAT team) have not been fully explored.
- The previous investigations on this topic frequently have not included an assessment of vertical jump which required multiple efforts.

The aim of this study was to examine the relationship between age and vertical jump performance among multi-jurisdictional SWAT team members.

METHODS

- **Subjects**: Seventeen (n=17, age 35.5 ± 5.9 yrs; HT 181.5 ± 8.4 cm; BM: 96.2 ± 13.1 kg) male police officers belonging to a multi-jurisdictional SWAT unit participated in this study.
- Multi-jurisdictional SWAT units are generally a collective group of SWAT operators from several smaller departments who combine forces and respond to the needs of all the law enforcement agencies they serve.
- **Procedures**: After anthropometric data and self-reported age were recorded, all officers performed four consecutive vertical jumps on a contact mat. Data collected from this assessment included average vertical jump height for the four jumps (VJ height) and the average ground contact time between jumps.
- **Statistical Analysis**: A Pearson correlation was used to determine if significant relationships ($p < .05$) existed between age, VJ height, and ground contact time. Linearity and absence of outliers were assessed via scatterplot of the dataset.

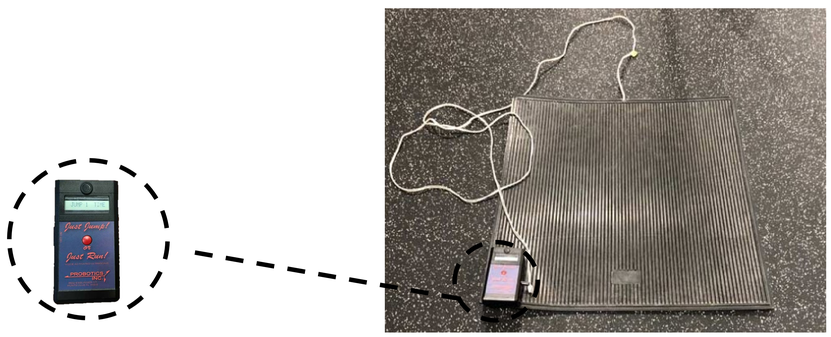

Figure 1. Just Jump System was used to capture VJ height and average ground contact time between jumps.

RESULTS

- No significant relationship (r = .245, r2 = 0.05, p = 0.97) was found between age and VJ height among the officers.
- However, a strong positive correlation between age and ground contact time (r = .712, r2 = 0.50, p = 0.001) was found.

Figure 1. Relationships between age and VJ height

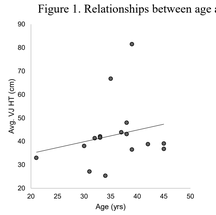

Figure 2. Relationships between age and GCT

Table 1. Descriptive Statistics for sample (*n* = 17)

Variable	Mean ± SD
Age (yrs.)	35.5 ± 5.9
Ht (cm)	181.5 ± 8.4
BM (kg)	96.2 ± 13.1
VJ Height	16.8 ± 5.3
GCT	0.4 ± 0.1

CONCLUSIONS

- The results of this study reveal that VJ height did not decrease with age. However, the results indicated that increased age was associated with a longer average ground contact time between the consecutive jumps.
- This suggested that older officers may have spent more time in contact with the ground to maintain the same jump height as their younger counterparts.
- This may be due to a greater dampening of the stretch-shortening cycle at ground contact among older officers.

PRACTICAL APPLICATIONS

- Older SWAT operators may utilize different jump strategies and rely more on concentric force production to achieve greater vertical jump heights in contrast to the utilization of stored elastic energy when ground contact time is reduced.
- Additionally, this may influence job performance by increasing the time to completion of power-based occupational tasks.

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