

# FACTORS INFLUENCING STUDY RETENTION IN LAW ENFORCEMENT OFFICERS

Zarmina Amin<sup>1</sup>, Hayden K. Giuliani-Dewig<sup>2</sup>, Gena R. Gerstner<sup>1</sup>, Nicholas A. Buoncristiani<sup>1</sup>,  
Amber N. Schmitz<sup>1</sup>, Eric D. Ryan<sup>1</sup>

University of North Carolina at Chapel Hill, Chapel Hill, North Carolina<sup>1</sup>  
Human Performance Innovation Center, Rockefeller Neuroscience Institute, West Virginia University, Morgantown<sup>2</sup>

## INTRODUCTION

- Law enforcement officers (LEO) are critical to public safety. However, their exposure to stressful and hazardous work conditions and unpredictable strenuous tasks may significantly impact their health-related quality of life (HR-QOL).
- LEO face higher rates of mental illness and often experience poor diet, low physical activity, and fatigue due to irregular schedules.<sup>5,7</sup>
- Therefore, the purpose of this study was to examine the how worker characteristics, behavioral factors, and HR-QOL impact the likelihood of completing a 12-month longitudinal study in LEO.

## METHODS

### Participants:

- 50 full-duty LEO (age: 37.10 ± 10.10 years, stature: 177.99 ± 8.10 cm, body mass: 94.19 ± 24.64 kg).

### Self-reported surveys:

#### Worker characteristics

- Demographics (sex, tenure, shift)
- Work Index (WI): Likert scale (1-5)<sup>4</sup>
- Work-Related Fatigue (WRF): Likert scale (1-5)<sup>5</sup>
- Mental Health: Patient Health Questionnaire (PHQ) – Anxiety and Depression: Likert scale (0-3)<sup>2</sup>

#### Behavioral characteristics

- Physical Activity: NASA scale (0 - 7)<sup>3</sup>
- Dietary Habits: Rapid Eating Assessment for Participants – Shortened Version (REAPS): Likert scale (1-3)<sup>6</sup>
- HR-QOL: visual-analog scale (0 = worse health, 100 = perfect health)<sup>1</sup>

### Measurements:

- Body Fat Percentage (%BF): 3-compartment model using ultrasound and bioelectrical impedance spectroscopy (Figure 1.A-B).
- Handgrip Strength (HGS): Peak dominant isometric peak force relative to body mass (N/kg; Figure 2.A-B).

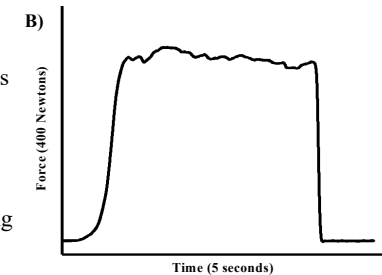
### Statistical Analysis:

- Exploratory logistic regression models were used to identify key worker and behavioral predictors of study completion ( $P \leq 0.25$ ). Significant predictors were included in a final multivariable logistic regression model ( $\alpha = 0.05$ ; Table 2).

## RESULTS



**Figure 1.** Portable assessments to examine %BF with A) bioelectrical impedance spectroscopy and B) ultrasound-derived subcutaneous fat thickness



**Figure 2.** A) Handgrip isometric dynamometer, B) sample force signals during an isometric maximal voluntary contraction (MVC)

**Table 1: Demographic, Survey, and Performance Data (M ± SD, or %)**

Variables	M ± SD, or %
Sex (%)	
Male	94.7
Female	5.3
Tenure (yr)	11.7 ± 8.6
Shift (%)	
Day	35.0
Night	40.0
Rotating	25.0
WI (au)	3.1 ± 0.3
WRF (au)	2.5 ± 0.9
PHQ (au)	28.4 ± 6.2
NASA (au)	4.0 ± 2.1
REAPS (au)	28.0 ± 4.1
HR-QOL (au)	64.4 ± 18.6
%BF (%)	28.4 ± 6.2
HGS (N/kg)	6.8 ± 2.3

Notes: WI = work index, WRF = work-related fatigue, PHQ = Patient Health Questionnaire, NASA = physical activity, REAPS = dietary habits, HR-QOL = health-related quality of life, %BF = body fat percentage, HGS = relative handgrip strength, M = mean, SD = standard deviation, % = percent, au = arbitrary unit, N/kg = Newton/kilogram, yr = years

**Table 2: Multivariable logistic Regression Model**

Variables	OR (95% CI)
Sex (au)	402.1 (7.5 – 21694.1)*
WI (au)	0.1 (0.0 – 2.6)
WRF (au)	0.4 (0.1 – 1.3)
NASA (au)	1.6 (1.0 – 2.5)*
REAPS (au)	0.7 (0.5 – 0.9)*
HR-QOL (au)	1.1 (1.0 – 1.1)*

Notes: WI = work index, WRF = work-related fatigue, NASA = physical activity, REAPS = dietary habits, HR-QOL = health-related quality of life standard error, CI = confidence interval, \* =  $P \leq 0.05$

## RESULTS

- A total of 19 LEO completed the study. The odds of study completion was more likely among males (OR: 402.12, 95% CI = 7.45-21694.06,  $P = 0.003$ ), those with greater physical activity levels (NASA score, OR: 1.60, 95% CI = 1.04-2.45,  $P = 0.049$ ), poorer eating habits (REAPS score, OR: 0.66, 95% CI = 0.50-0.88,  $P = 0.006$ ), and higher HR-QOL score (OR: 1.07, 95% CI = 1.01-1.13,  $P = 0.026$ ).

## CONCLUSIONS

- Sex, physical activity, dietary habits, and HR-QOL were significantly associated with study retention. These factors may play an important role in shaping engagement and adherence in longitudinal HR-QOL research within LEO.

## PRACTICAL APPLICATIONS

- Researchers and professionals working with LEO should be aware that individual characteristics—including sex, physical activity levels, dietary habits, and HR-QOL, may influence study retention. Considering these factors during recruitment and engagement planning may enhance data completeness in longitudinal studies and inform participants-centered strategies.

## REFERENCES

1. de Boer, A., et al. (2004). Is a single-item visual analogue scale as valid, reliable, and responsive as multi-item scales in measuring quality of life? *Quality of Life Research*, 13(2), 311–320.
2. Kroenke, K., Spitzer, R. L., & Williams, J. B. (2002). The PHQ-15: validity of a new measure for evaluating the severity of somatic symptoms. *Psychosomatic medicine*, 64(2), 258–266.
3. Hernandez, R., et al. (2022). Validation of the National Aeronautics and Space Administration Task Load Index (NASA-TLX) adapted for the whole day repeated measures context. *Ergonomics*, 65(7), 960–975.
4. Hertogh, E. M., Monnikhof, E. M., Schouten, E. G., Peeters, P. H., & Schuit, A. J. (2008). Validity of the modified Baecke questionnaire: comparison with energy expenditure according to the doubly labeled water method. *The international journal of behavioral nutrition and physical activity*, 5, 30.
5. Jetelina, K., et al. (2020). Prevalence of mental illness and mental health care use among police officers. *JAMA Network Open*, 3(10), e2019658–e2019658.
6. Pols, M. A., et al. (1995). Validity and repeatability of a modified Baecke Questionnaire on physical activity. *International Journal of Epidemiology*, 24(6), 1011–1018.
7. Ramey, S. L., et al. (2012). The effect of work shift and sleep duration on various aspects of police officers' health. *Work*, 43(2), 133–142.
8. Segal-Isaacson, C. J., et al. (2004). Validation of a short dietary assessment questionnaire: The Rapid Eating and Activity Assessment for Participants short version (REAP-S). *Diabetes Educator*, 30, 774–778.

## FUNDING

This project was supported by NIOSH (# T42OH008673) and the National Strength and Conditioning Association Foundation