

REPORT DOCUMENTATION PAGE

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION.

1. REPORT DATE 20211015	2. REPORT TYPE Final	3. DATES COVERED	
		START DATE	END DATE
4. TITLE AND SUBTITLE Information Paper: Response Accuracy for Injury and Physical Fitness Survey Questions			
5a. CONTRACT NUMBER	5b. GRANT NUMBER	5c. PROGRAM ELEMENT NUMBER	
5d. PROJECT NUMBER	5e. TASK NUMBER	5f. WORK UNIT NUMBER	
6. AUTHOR(S) Schuh-Renner, Anna; Jones, Bruce H.; Canham-Chervak, Michelle			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Army Public Health Center (APHC), Clinical Public Health and and Epidemiology Directorate, Injury Prevention Branch, Aberdeen Proving Ground, MD 21010-5403			8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Army Public Health Center		10. SPONSOR/MONITOR'S ACRONYM(S) APHC	11. SPONSOR/MONITOR'S REPORT NUMBER(S)
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for Public Release/Distribution Unlimited			
13. SUPPLEMENTARY NOTES			
14. ABSTRACT The Injury Prevention Branch (IPB) routinely collects survey responses about recent injuries, physical characteristics, and physical fitness test scores to investigate injury risks in various Army populations. Efforts to investigate the accuracy of survey-collected injury and physical fitness data are described. Injury and fitness information have consistently been accurate and valid when compared to other data sources.			
15. SUBJECT TERMS			
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT NONE
a. REPORT UNCL	b. ABSTRACT UNCL	c. THIS PAGE UNCL	
			18. NUMBER OF PAGES 3
19a. NAME OF RESPONSIBLE PERSON Dr. Anna Renner			19b. PHONE NUMBER (Include area code) 410-417-2886

INFORMATION PAPER

MCHB-PH-MIP
15 October 2021

SUBJECT: Response accuracy for injury and physical fitness survey questions

1. PURPOSE: To summarize validation of survey data collected by the Injury Prevention Branch (IPB)

2. FACTS:

a. While injury diagnoses and Soldier demographics are routinely captured in military medical databases, injury cause-coding is not required.¹ Therefore, self-reported information from survey respondents, such as the activities, mechanisms, and limited duty time associated with injuries, can provide valuable details to inform leadership in the development and prioritization of injury prevention efforts and strategic initiatives.² Likewise, information about known risk factors for injuries among military populations – such as physical fitness, body composition, and health behaviors like participation in physical training, sleep habits, and smoking history – may not always be consistently available. Self-reported survey responses are often the best available data source to investigate the effects of these factors on injury risk.

b. The accuracy of self-reported Soldier injury information has been investigated.³ When self-reported injury information on a paper survey was compared to medical record injury diagnosis data from the Defense Medical Surveillance System (DMSS), 75% of self-reported injuries closely matched medical record information for injury date, injured body region, and injury type. This high degree of alignment suggests that other self-reported details like activities, mechanisms, and limited duty associated with these injuries are likely accurate as well. As an additional benefit, minor injuries that are reported on surveys but do not receive medical attention can be considered in analyses. In the validation effort, it was found that injuries were less likely to be self-reported if they occurred further in the past (recall bias) or if they were less severe, which may result in under-reporting. Recent Soldier surveys now utilize an electronic format, which may reduce answer avoidance and improve survey response agreement with medical records even further.

c. Survey-reported Army Physical Fitness Test (APFT) data has been validated.^{4,5} When self-reported performance on the push-up, sit-up, and 2-mile run time events of the APFT were compared to unit-collected records in the Defense Training Management System (DTMS) in two different populations, correlations were very good ($r=0.71-0.83^4$, $r=0.78-0.87^5$), for both men and women. Therefore, in cases when this information is not available in the DTMS (e.g., due to troop movement), investigators

can confidently rely upon self-reported information instead. Especially because slower performance on the APFT 2-mile run has frequently been associated with increased injury risk for Soldiers,⁶ having multiple valid methods to collect this data is important.

d. Self-reported body mass index (BMI) information has been validated.⁵ When self-reported height and weight information was compared to DTMS data, correlations were very high for both sexes ($r=0.78-0.98$), and resulting BMI calculations were also highly correlated ($r=0.78-0.88$). Because high and low BMI are risk factors for military injuries,⁷ and more comprehensive body composition assessments may be unavailable to many populations, valid height and weight information from multiple sources is valuable.

e. When applicable, survey questions recommended by nationally-recognized expert organizations are utilized. For example, many frequently asked IPB survey questions about cigarette smoking and exercise follow tools for assessing tobacco use and physical activity provided by the Centers for Disease Control and Prevention,^{8,9} and routinely utilized questions about Soldier sleep habits are based on recommendations from the National Sleep Foundation.¹⁰

f. As part of routine data cleaning procedures, raw survey data containing extremely unreasonable information is not considered in analyses (e.g., a reported height of 8 feet). This ensures that aggregated summaries of self-reported information are minimally impacted by erroneous entries.

g. Injury and fitness information that are integral to epidemiologic analyses of Soldier injuries have consistently been accurate and valid when compared to other data sources. These results encourage overall confidence in self-reported information, especially when alternative data sources are not available.

Dr. Michelle Chervak/(410) 436-3992
Approved by: Dr. Raúl A. Mirza

References

1. Canham-Chervak M, Steelman RA, Schuh A, Jones BH. Importance of external cause coding for injury surveillance: lessons from assessment of overexertion injuries among US Army soldiers in 2014. *Medical surveillance monthly report*. 2016;23(11):10-15.
2. Gunlicks JB, Patton JT, Miller SF, Atkins MG. Public health and risk management: a hybridized approach to military injury prevention. *American journal of preventive medicine*. 2010;38(1):S214-S216.
3. Schuh-Renner A, Canham-Chervak M, Grier T, Jones B. Accuracy of self-reported injuries compared to medical record data. *Musculoskeletal science and practice*. 2019;39:39-44.
4. Jones SB, Knapik JJ, Sharp MA, Darakjy S, Jones BH. The validity of self-reported physical fitness test scores. *Military medicine*. 2007;172(2):115-120.
5. Martin RC, Grier T, Canham-Chervak M, et al. Validity of Self-Reported Physical Fitness and Body Mass Index in a Military Population. *The Journal of Strength & Conditioning Research*. 2016;30(1):26-32.
6. Jones BH, Hauschild VD, Canham-Chervak M. Musculoskeletal training injury prevention in the US Army: Evolution of the science and the public health approach. *Journal of science and medicine in sport*. 2018.
7. Jones BH, Hauret KG, Dye SK, et al. Impact of physical fitness and body composition on injury risk among active young adults: A study of Army trainees. *J Sci Med Sport*. 2017;20:S17-S22.
8. Centers for Disease Control and Prevention. Adult Tobacco Use Questions: List of Questionnaires. 2017; https://www.cdc.gov/nchs/nhis/tobacco/tobacco_questions.htm. Accessed July 1, 2021.
9. Centers for Disease Control and Prevention. Adult Physical Activity Questions: List of Questionnaires. 2017; https://www.cdc.gov/nchs/nhis/physical_activity/pa_questions.htm. Accessed July 9, 2021.
10. Knutson KL, Phelan J, Paskow MJ, et al. The National Sleep Foundation's sleep health index. *Sleep health*. 2017;3(4):234-240.