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Adherence to National Diet and Physical Activity Objectives Among Active Duty Military Personnel: What are the Implications?

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The federal government issues evidence-based nutrition and physical activity guidance, such as the *Dietary Guidelines for Americans* and *Physical Activity Guidelines for Americans*, to promote health, reduce the risk of chronic diseases, and reduce the prevalence of overweight and obesity through improved nutrition and physical activity.^{1,2} These Federal guidelines and the associated implementation and communication strategies that are developed for health professionals, program and policy groups, and the public, aim to promote the consumption of nutrient-dense foods and beverages and regular physical activity to achieve reduction of chronic disease risk and foster health promotion and disease prevention. These Federal guidelines also provide the foundation for *Healthy People* national health promotion and disease prevention objectives related to nutrition and physical activity and measurable targets to be achieved over a decade.³ In this issue, Smith and colleagues compare the diet and leisure-time physical activity behaviors of active duty military personnel based on the 2005 Department of Defense (DoD) Health Related Behaviors Survey (HRBS)⁴ to *Healthy People 2010* objectives and *Dietary Guidelines for Americans, 2005* recommendations.^{5,6}

The HRBS is a unique survey that targets the active duty military population, a group whose demographic and lifestyle characteristics differ from those of the civilian U.S. population. Although active duty military personnel are sampled in the National Health Interview

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Survey (NHIS) and the Behavior Risk Factor Surveillance System (BRFSS), this population subgroup is excluded from other surveys including the National Health and Nutrition Examination Survey (NHANES).^{7–9} Additionally, although the NHIS and BRFSS include active duty personnel in their samples, separate health estimates are not reported for active duty personnel. Thus, the cross-sectional HRBS data are an important component of the DoD's ongoing efforts to assess, monitor, and improve the well-being of U.S. active duty military personnel.¹⁰

The foundation of the *Healthy People 2010* initiative was “healthy people in healthy communities” in recognition of the fact that preventable conditions such as obesity and many chronic diseases have far-reaching economic and strategic consequences for the entire U.S. population.⁵ The *Healthy People 2010* framework includes specific objectives in 28 Focus Areas. Smith and colleagues focused upon *Healthy People 2010* Focus Area 19, “Nutrition and Overweight” whose overarching goal was to promote health and reduce chronic disease associated with diet and weight, and Focus Area 22, “Physical Activity and Fitness” that targeted improved health, fitness, and quality of life through daily physical activity. The *Dietary Guidelines for Americans* provide the foundation for the *Healthy People* nutrition objectives, including specific evidence-based recommendations to help Americans choose a nutritious diet, maintain a healthy weight, and achieve adequate physical activity.⁵ The DoD made the assessment of progress toward achieving *Healthy People 2010* health promotion objectives an integral component of the 2005 HRBS.¹⁰

In recent decades, all sectors of U.S. society have been affected by rising obesity and chronic disease health trends, including the U.S. military for whom filling the ranks with healthy, fit young adults is vital to protect our national security. The impact of the nation's obesity epidemic on military readiness, recruitment, and retention was brought to light in a recent report commissioned by Mission: Readiness, an organization comprised of retired senior military leaders entitled “*Too Fat to Fight*”.¹¹ The coalition reported that 27% of Americans 17 to 24 years, the prime age group for military recruitment, do not meet weight-for-height standards. Further, the report recommended that the military continue efforts to promote healthy diet and physical activity lifestyles within its ranks to ensure that those who are recruited are retained, remain healthy, and are able to perform their duties to support national security. The article by Smith and colleagues is thus especially informative with respect to providing insight into the myriad of factors that are associated with diet, leisure-time physical activity and weight status of active duty military personnel. The study results attest to the challenges that the active duty military population faces with respect to achieving and maintaining weight status and healthy lifestyle behaviors. We take this opportunity to highlight the study results and to offer our perspective on new approaches to strengthen the scientific evidence base on the health behaviors of active duty military personnel from our vantage as federal staff associated with *Healthy People* and retired service members.

Our first comment pertains to weight status and the problem of achieving and maintaining healthy weight throughout adulthood. We acknowledge that the U.S. armed forces have experienced serious problems with respect to readiness and force retention related to overweight and obesity. We caution however that the estimates presented in this paper are based solely on body mass index (BMI) results. The sensitivity and specificity of BMI have been shown to be poor. BMI does not take age, sex, bone structure, fat distribution or fat mass into account.¹² The relationship between BMI and percentage of body fat is not linear and differs for men and women.¹² Thus, lean, muscled individuals, male or female, with a BMI in the overweight range (25.0–29.9) may be classified as overweight even though their percentage body fat is in a healthy range. BMI is only one measure of body composition used by the military and it may not be the best measure given the limitations noted. Most of

the military services use BMI as a screening measure. Active duty service members whose BMI value exceeds the standards for their branch of service receive additional assessments to calculate their percentage body fat.^{10,13} Another intriguing question related to BMI status that was not explored in this paper has to do with the reasons active duty personnel cited for weight change during the past year. Of potential relevance to the topic of weight gain are the health, personal, and service-related factors that impact the weight status of active duty personnel. Self-reported information was collected during the 2005 HRBS on the reasons for recent weight gain.¹⁰ This information could inform efforts to develop tailored health programs for active duty personnel, particularly those over 30 years of age as a means of preventing inappropriate weight gain during adulthood.

With respect to achieving and maintaining healthy weight status, diet and physical activity are two important components of ongoing public health efforts to achieve and maintain healthy weight status. The study results showed that adherence to diet and physical activity recommendations was lower among adults over 30 years of age compared to younger service members. One possibility is that younger service members, especially those 17 to 20 years, have more structured meal and physical activity routines than service members 21–30, 31–39 or 40+ years. As such, younger service members may dine in mess halls and dining facilities that typically offer a varied selection of foods including fruits, vegetables and whole grains. Additionally, basal energy requirements are higher among younger service members. Their higher metabolic energy requirements coupled with increased total energy expenditure related to duty-related and leisure-time physical activity may make it easier for younger service members to achieve energy balance. The study results showing that skipping breakfast and higher frequencies of away from home dining were associated with higher rates of weight gain during the past year and lower rates of meeting the *Healthy People* dietary intake targets. Additional research is needed to identify the factors that contribute to age-related changes in physical activity, food choices, and meal patterns of active duty service members.

Several new lines of research could explore the reasons why for example, older service members are less likely to engage in leisure-time physical activity or prepare meals at home. As is true with the civilian U.S. population, the decision-making processes are likely influenced by personal, family, worksite, and in this case, service duty factors. With respect to physical activity behavior, the focus in this study was on leisure-time activity defined, but not explicitly stated in the question as, “exercise, sports, and physically active hobbies performed during one’s leisure time (i.e., non-work or duty-related in this case). One could postulate that in this population, individuals who engage in physically strenuous service-related activities may not engage in leisure-time activity because they have already exerted themselves during their tour or work shift. Additionally, the concept of vigorous and moderate intensity leisure-time physical activity may have a different meaning in this population compared to the civilian population. In any case, an element of subjectivity remains in the self-appraisals of activity intensity. The physical activities in which active duty service personnel engage may differ from those of the civilian population too. Service duty activities such as walking/marching, swimming, climbing and running would likely be categorized as leisure-time physical activity by civilians. Qualitative research with this population would be informative to understand how the standardized physical activity questionnaire instruments that are used in many health surveys are interpreted by active duty military personnel. Finally, with respect to older active duty personnel, the observed declines in leisure-time physical activity may reflect time and logistical constraints related to one’s family, career, and duty station location. We do not have enough information regarding time use, real or perceived time constraints, decision-making, and other influences on leisure-time physical activity behavior in this diverse population.

Numerous factors also influence meal patterns and food choices, some of which are related to time use and constraints and the conscious and unconscious decision-making processes. Little is known about the meal patterns of military families, their lifestyles and factors that impact food choices and meal planning. Active duty personnel are required to be on duty “24/7.” Depending on their duty station, dining facilities may be closed during evening and weekend hours, leaving fewer healthy dining options. Additionally, while some military bases are large and offer commissary, dining, fitness, recreational facilities, and post exchanges on the base or in the surrounding communities, many active duty personnel serve on ships, submarines, and in remote areas for extended periods of time.

The HRBS dietary results are based on food frequency data rather than 24-hour dietary recall data, the data source that is used to assess adherence to the Dietary Guidelines in *Healthy People*. Food frequency methods are widely used in epidemiologic studies to collect information about usual long-term food consumption patterns.¹⁴ While the HRBS dietary pattern information is useful and sheds light on several questions of interest, the HRBS food frequency data are not sufficiently detailed to answer other important questions related to dietary behavior such as when and where meals are eaten, specific food selections and meal patterns, and the quantities of food consumed by active duty personnel. Additional research is needed to explore the dietary patterns of active duty personnel. The baseline estimates for *Healthy People 2010*, the basis for comparison in the HRBS, reflect dietary intakes reported during the 1994–96 U.S. Department of Agriculture Continuing Survey of Food Intakes of Individuals (CSFII), which occurred a decade prior to the 2005 HRBS.¹⁵ Nevertheless, the HRBS findings suggest that access to healthy foods and convenience are two priorities for active duty service members. In 2011, the General Services Administration (GSA) in collaboration with the U.S. Department of Health and Human Services (DHHS) released Health and Sustainability Guidelines for Federal Concessions and Vending Operations as a means of promoting the *Dietary Guidelines for Americans, 2010* and demonstrating HHS’ and GSA’s commitment to a healthy workforce.¹⁶ The Health and Sustainability Guidelines constitute an important step and can be adapted to many food service settings, including military food service and vending operations.

A broad, social-ecological view of active duty military communities and lifestyles is needed to develop effective strategies to improve health. This brings us to our final point regarding the need for a comprehensive data collection and surveillance system to inform health and wellness initiatives for active duty personnel. Several suggestions are provided as a means of strengthening the evidence base that informs health promotion activities for this population. We see improved data quality and coverage as essential to expanding the knowledge base and improving the ability of ongoing health surveillance and data systems to answer strategic questions pertaining to health and wellness of active duty personnel.

Smith and colleagues stated that the HRBS response rate of 51.8 percent was lower than expected due to personnel deployment. Although potential nonresponse bias was not evaluated in the target sample (non-deployed personnel), the suboptimal response rates are concerning because we know that another large segment of the active duty population was unable to participate in the HRBS due to duty-related constraints. The study results were weighted to be representative of the entire U.S. active duty military population which differs from the civilian U.S. population with respect to age (younger), having higher percentages of males (85%), higher education attainment, and many other characteristics.¹⁷ Our initial thoughts are to a broad spectrum of data gathering tools including mobile and web-based data collection technology to expand the reach of DoD health survey data systems. Many government and non-government groups currently survey civilian and active duty beneficiaries using confidential, automated, survey methods. In addition to capturing important information on a larger, representative sample, and reducing respondent burden

and data processing time through the use of automated data collection, one can potentially achieve higher response rates. Another possibility would be to link to other electronic DoD health databases that are managed by the Tricare system, the nationwide managed care program for the Military Health System (MHS).¹⁸ Extensive health data are collected routinely on active duty personnel throughout their military careers and thus the potential for longitudinal data collection. Such data linkages would expand the health information that is used to plan and evaluate health promotion programs and assess trends over time through the use of objective health, nutrition, physical activity, and biomarker data. These potential areas of research are worth exploring in the near future.

We are encouraged that since the 2005 HRBS data were collected, DoD has embarked on comprehensive force wellness initiatives targeting all Tricare beneficiaries, including active duty personnel. The MHS Senior Oversight Committee was created in 2008 to evaluate and oversee the recommendations of the Task Force on the Future of Military Health Care, a Subcommittee of the Defense Health Board Care.¹⁹ One of the Task Force recommendations was that “DoD should follow national wellness and prevention guidelines and promote the appropriate use of health care resources through standardized case management and disease management programs. These guidelines should be applied across the MHS to ensure military readiness and optimal beneficiary health.”²⁰ The DoD has taken the recommendations seriously and is actively engaged in force wellness initiatives that target active duty personnel and provide education, health promotion, and health prevention resources to improve military readiness and retention.

Conclusions

This report should stimulate new research on the health behaviors of active duty military personnel. Diet and physical activity behaviors are extremely complex and thus a “one size fits all” approach is unrealistic for this diverse population. From our vantage, tremendous progress has been made and we are optimistic that new opportunities for DoD to engage with federal and public partners will arise. New qualitative and quantitative research is needed to identify the determinants of health behaviors and relate these findings to actual health measures among active duty personnel. Such research can promote the development of promising strategies to achieve sustained healthful behavior change associated with the achievement and maintenance of optimum health and fitness in our active duty service members. Successful approaches can then serve as a model to improve the health of family members and the general public.

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