Association between Body Composition Standards and Disordered Eating Among Active-Duty Service Women

Jessica Korona-Bailey[1,2]*, Amanda Banaag[1,2], Jasmine Walker[1], Stephanie Fortin[1], Megan Eyeler[1] and Tracey Perez Koehlmoos[1]

[1]Department of Health, Uniformed Services University of the Health Sciences, Bethesda, USA

[2]The Henry M Jackson Foundation for the Advancement of Military Medicine Inc., Bethesda, USA

Corresponding author: Jessica Korona-Bailey, Department of Health, Uniformed Services University of the Health Sciences, Bethesda, United States, E-mail: Jessica.korona.ctr@usuhs.edu

Abstract

Introduction: Eating disorders are a worldwide public health concern with the United States having a particularly high prevalence. Eating disorders are of particular concern to the Department of Defense and Military Health System (MHS) because body composition standards are in place for active duty service members.

Methods: We conducted a cross-sectional study of Active-Duty Service Women (ADSW) ages 18 and older in the U.S. Army, Air Force, Navy and Marine Corps during Fiscal Years (FY) 2018-2019. Utilizing claims data from the MHS Data Repository (MDR), we identified ADSW with a Body Mass Index (BMI) measure during the study period and compared their BMI to service-specific requirements and diagnosis of an eating disorder.

Results: We identified a total of 161,209 ADSW from the MDR in FYs 2018 to 2019 with a recorded BMI, of whom 61,711 (38.3%) had a BMI exceeding the maximum BMI service-specific standards during the study period and 0.5% had an eating disorder diagnosis. Increased risk of an eating disorder was found overwhelmingly in ADSW with an Underweight BMI. Further, we found that there was no association of disordered eating diagnoses among ADSW who were near the height/weight standard set by their service.

Conclusion: There appears to be no association between body composition standards of the services and eating disorder diagnoses in ADSW. We were not able to investigate unhealthy habits around diet or exercise directly related to body composition standards.

Keywords: Disordered eating; Body composition standards; Military health system; Active duty service women; Women's health

Introduction

Eating disorders are a worldwide public health concern with the United States (U.S.) having a particularly high prevalence [1,2]. In the U.S., the prevalence of eating disorders ranges from 2.0%-13.5% and studies show women to have a greater odds of lifetime diagnosis compared to men [1,2]. Eating disorders are defined as disordered eating patterns or behaviors that can negatively impact physical and psychological health and manifest in a number of different diagnoses classified as anorexia nervosa, bulimia nervosa and binge eating disorder. An additional disorder is "other specified feeding or eating disorders" which includes any type of abnormal eating behavior that impairs an individual's social life [1-3].

Eating disorders can cause long term physical health consequences including malnutrition, over nutrition, gastrointestinal issues, endocrine and metabolic disorders, reproductive issues, cardiovascular problems, osteoporosis and skin problems [4]. Comorbidities include mental health conditions such as depression, bipolar disorder, anxiety, suicidality, obsessive compulsive disorder, Post-Traumatic Stress Disorder (PTSD), substance use disorders and sleep disturbances [4-6]. In fiscal year 2018-2019, total economic costs for eating disorders were estimated to be $64.7 billion. Costs of reduced wellbeing was valued at $326.5 billion leading to an urgency in identifying effective policy actions to reduce the impact of eating disorders [7].

Eating disorders are of particular concern to the Department of Defense (DoD) and Military Health System (MHS), which is charged with ensuring the health of the nation's fighting force, of which, 17% are Active-Duty Service Women (ADSW) [8]. Some studies show that prevalence estimates of eating disorders in the U.S. military are similar to the general population, however other survey-based studies show higher prevalence [3,9,10]. A number of factors increase the risk of ADSW developing an eating disorder. For example, traumatic experiences are a strong risk factor [3]. Additionally, limited evidence has shown that height and weight regulations have brought on unhealthy dieting behaviors by service members to meet standards

[11,12]. Eating disorders can detrimentally impact a service member's readiness as some individuals with the condition experience dizziness, fatigue, trouble concentrating and electrolyte imbalances, all of which could endanger other service members and consume medical resources [3,13]. While several studies have assessed prevalence of eating disorders in ADSW and female veterans, more recent studies using population level data are lacking. Further, there are no studies looking at the relationship between body composition standards and disordered eating. The aim of this study is to assess the prevalence of eating disorders in ADSW in Fiscal Years (FY) 2018-2019 and associated risk factors, while also comparing Body Mass Index (BMI) of ADSW to height and weight standards of the services.

Materials and Methods

Data source and study design

We used the MHS Data Repository (MDR) to conduct a cross-sectional study of ADSW in the U.S. Army, Air Force, Navy and Marine Corps during Fiscal Years (FYs) 2016 to 2019. The MDR houses administrative and healthcare claims data for MHS beneficiaries including active-duty service members, retirees and their dependents; however, claims data does not capture care delivered in combat zones or through the veterans' health administration [14]. Data from the MDR has been used in previous studies investigating health of ADSW [15,16].

Study population

Using the Defense Enrollment Eligibility Reporting System (DEERS) in the MDR, we identified all ADSW ages 18 years and older from FYs 2018 to 2019. Women in the National Guard or Reserves, both active and inactive, were excluded due to their inconsistent access to care in the MHS. Additionally, we excluded pregnant women as well as 12-month postpartum women from our population. Utilizing International Classification of Disease codes, 10th revision (ICD-10), we identified ADSW with a diagnosis of an eating disorder. Disordered eating was defined as anorexia (F50.0), bulimia (F50.2), other categories such as binge eating to include binge, avoidant or restrictive (F50.81, F50.89 and F50.9) [17].

Each of the military service branches has instituted body composition standards to ensure a force that looks both professional and can physically perform their job which is to ultimately defend the U.S. from all enemies both foreign and domestic. BMI was calculated using the following metric system formula: (Weight (lbs)/(height in inches (in)) 2 × 703). The respective service-specific BMI cutoffs listed in **Table 1** [18-20] are from the time period of the study.

Table 1: Maximum body mass index cutoffs by service branch and year.

Military service branch	Different categories	Body mass index cutoff	Year
Army	Age ≤ 20	25	2013
	Age 21-27	25.3	
	Age 28-39	25.6	
	Age ≥ 40	26	
Air Force	-	27.5	2019
Navy	Height ≤ 61 inches	27.5	2016
	Height 62-65 inches	27	
	Height 66-69 inches	26	
	Height 70-71 inches	25.5	
	Height ≥ 72 inches	25	
Marine Corps	-	25.9	2016

Prevalence of eating disorders was assessed by several demographic characteristics including age, service branch, marital status, race and rank which is a proxy for socioeconomic status. The study population was assessed by BMI classification based on standards of each service branch and overall BMI category. Service-specific BMI categories were defined first as below minimum BMI standards and exceeds maximum BMI standards. We created a borderline BMI defined as ± one BMI value above/below each service's maximum value. BMI classification was determined using the following standard categorization: Underweight (<18.5 kg/m^2), healthy weight (18.5-24.9 kg/m^2), overweight (25–29.9 kg/m^2) and obese (≥ 30 kg/m^2). The most recent and biologically plausible BMI measurement per patient was retained for analysis. Implausible

BMI values were identified for exclusion if they were greater than ± 3 times the interquartile range and if recorded height values did not meet minimum accession standards for each service.

Statistical analysis

Descriptive statistics were performed on patient demographics and service-related characteristics (age group, race and military service rank, branch of service, BMI category and service BMI standard) for the total population and by eating disorder diagnosis. The prevalence of eating disorders in ADSW was calculated and expressed as a percentage. Group differences between ADSW with and without eating disorders were analyzed utilizing the chi-square test for independence. Unadjusted logistic regression analysis was performed on each categorical variable to assess their association with eating disorder diagnosis in ADSW. To control for confounding factors, a subsequent logistic regression was performed and adjusted by all factors. Any observations with missing values were automatically removed from the logistic regression analyses. For all analyses, P-values<0.05 were considered statistically significant and were performed using SAS version 9.4. The study was considered exempt by the Institutional Review Board (IRB) of the Uniformed Services University of the Health Sciences.

Results

We identified a total of 161,209 ADSW from the MDR in FYs 2018 to 2019, of whom 38.3% had a BMI exceeding their service-specific maximum BMI standard during the study period, 61.7% had a BMI below the service-specific maximum BMI standard and 21.0% had a borderline BMI. **(Table 2)** details demographic distributions for the total ADSW study population and within group distributions by service-specific BMI standard category during the study period. The majority of groups, including those with an eating disorder (52.5%), had a BMI below service-specific standards, However, ADSW aged 35-44 (51.3%), of Black race (51.1%) and of senior enlisted rank (50.5%) had a BMI exceeding the maximum service-specific BMI standard. We identified 765 (0.5%) ADSW with an eating disorder diagnosis during the study period **(Table 3)**. When assessing by demographic characteristics, the majority of ADSW were age 18-24 (50.2%), of White race (62.3%), unmarried (65.8%) and with a healthy BMI (39.0%). The borderline service-specific BMI standard category accounted for 14.6% of eating disorder diagnoses. For service-specific factors, the majority of ADSW with an eating disorder were in the Army (34.0%) and were a junior enlisted rank (48.8%).

Table 2: Demographics of ADSW study population by status of meeting service-specific maximum BMI standards, FY 2018-2019.

	Total study population	Below maximum BMI standards	Exceeds maximum BMI standards	Borderline BMI
		N (row%)	N (row%)	N (row percent of total pop%)
Total	161209	99498 (61.72)	61711 (38.28)	33790 (20.96)
Age group (years)				
18 to 24	76584	52686 (68.80)	23898 (31.20)	16287 (21.27)
25 to 34	53902	31727 (58.86)	22175 (41.14)	11265 (20.90)
35 to 44	24568	11968 (48.71)	12600 (51.29)	4940 (20.11)
45 to 54	5678	2848 (50.16)	2830 (49.84)	1200 (21.13)
≥ 55	477	269 (56.39)	208 (43.61)	98 (20.55)
Race				
White	93224	61635 (66.11)	31589 (33.89)	20012 (21.47)
Black	42385	20714 (48.87)	21671 (51.13)	8980 (21.19)
Asian/Pacific Islander	11662	7784 (66.75)	3878 (33.25)	2273 (19.49)
American Indian/Alaskan Native	1892	1100 (58.14)	792 (41.86)	444 (23.47)
Other	6792	4172 (61.43)	2620 (38.57)	1271 (18.71)
Missing	5254	4093 (77.90)	1161 (22.10)	810 (15.42)
Marital status				

Married	60194	34492 (57.30)	25702 (42.70)	12587 (20.91)
Unmarried	101015	65006 (64.35)	36009 (35.65)	21203 (20.99)
Service				
Army	57791	30550 (52.86)	27241 (47.14)	14197 (24.57)
Air Force	53848	37165 (69.02)	16683 (30.98)	9134 (16.96)
Navy	36255	21182 (58.43)	15073 (41.57)	6910 (19.06)
Marine Corps	13315	10601 (79.62)	2714 (20.38)	3549 (26.65)
Rank				
Junior Enlisted	78322	51112 (65.26)	27210 (34.74)	17010 (21.72)
Senior Enlisted	47733	23637 (49.52)	24096 (50.48)	9888 (20.72)
Junior Officer	25527	17960 (70.36)	7567 (29.64)	5117 (20.05)
Senior Officer	5639	3386 (60.05)	2253 (39.95)	1139 (20.20)
Other	3988	3403 (85.33)	585 (14.67)	636 (15.95)
Eating disorder diagnosis				
No	160442	99095 (61.76)	61347 (38.24)	33678 (20.99)
Yes	767	403 (52.54)	364 (47.46)	112 (14.60)

Note: Borderline population includes service women from the below maximum BMI standard and exceeds maximum BMI standard categories. ADSW: Active Duty Service Women.

Table 3: Demographics of ADSW study population by eating disorder status and chi-square P-values from difference in frequency tests, FY 2018-2019.

	Total study population	No eating disorder diagnosis	Eating disorder diagnosis	Chi-square tests
	N (col%)	N (col%)	N (col%)	p-value
Total	161209	159967	765	-
Age group (years)	-	-	-	0.257
18 to 24	76584 (47.51)	76199 (47.49)	385 (50.20)	-
25 to 34	53902 (33.44)	53661 (33.45)	241 (31.42)	-
35 to 44	24568 (15.24)	24447 (15.24)	121 (15.78)	-
45 to 54	5678 (3.52)	5660 (3.53)	18 (2.35)	-
≥ 55	477 (0.30)	*	*	-
Race	-	-	-	0.0134
White	93224 (57.83)	92746 (57.81)	478 (62.32)	-
Black	42385 (26.29)	42203 (26.30)	182 (23.73)	-
Asian/Pacific Islander	11662 (7.23)	11626 (7.25)	36 (4.69)	-

American Indian/Alaskan Native	1892 (1.17)	*	*	-
Other	6792 (4.21)	6761 (4.21)	31 (4.04)	-
Missing	5254 (3.26)	5220 (3.25)	34 (4.43)	-
Marital status	-	-	-	0.068
Married	60194 (37.34)	59932 (37.35)	262 (34.16)	-
Unmarried	101015 (62.66)	100510 (62.65)	505 (65.84)	-
Service	-	-	-	0.0009
Army	57791 (35.85)	57530 (35.86)	261 (34.03)	-
Air Force	53848 (33.40)	53628 (33.43)	220 (28.68)	-
Navy	36255 (22.49)	36046 (22.47)	209 (27.25)	-
Marine Corps	13315 (8.26)	13238 (8.25)	77 (10.04)	-
Rank	-	-	-	0.1431
Junior Enlisted	78322 (48.58)	77948 (48.58)	374 (48.76)	-
Senior Enlisted	47733 (29.61)	47492 (29.60)	241 (31.42)	-
Junior Officer	25527 (15.83)	25423 (15.85)	104 (13.56)	-
Senior Officer	5639 (3.50)	5617 (3.50)	22 (2.87)	-
Other	3988 (2.47)	3962 (2.47)	26 (3.39)	-
BMI category	-	-	-	<0.0001
Underweight	1318 (0.82)	1294 (0.81)	24 (3.13)	-
Healthy	73141 (45.37)	72842 (45.40)	299 (38.98)	-
Overweight	64176 (39.81)	63945 (39.86)	231 (30.12)	-
Obese	22574 (14.00)	22361 (13.94)	213 (27.77)	-
Body composition status	-	-	-	<0.0001
Below maximum BMI standards	99498 (61.72)	99095 (61.76)	403 (52.54)	-
Exceeds maximum BMI standards	61711 (38.28)	61347 (38.24)	364 (47.46)	-
Borderline BMI	33790 (20.96)	33678 (20.99)	112 (14.60)	<0.0001

Note: *Censored due to one or more stratified cell counts <11. ADSW: Active Duty Service Women; BMI: Body Mass Index.

Table 4 shows unadjusted and adjusted logistic regression results characteristics of ADSW associated with an eating disorder diagnosis during the study period. After adjustment for all variables included in the model, logistic regression results indicate there is no association between having a BMI within the borderline limits of service-specific standards and having an eating disorder diagnosis (p>0.05). While having an overweight BMI was not significantly associated with an eating disorder

(p>0.05), we observed higher odds of an eating disorder in ADSW being in an underweight BMI category (Adjusted Odd Ratio (AOR)=4.48, Class Intervals (CI): 2.89-6.95) and obese BMI category (AOR)=2.21, CI: 1.57-3.11) compared to those with a healthy BMI. With regards to demographic and service characteristics, logistic regression results indicate lower odds of an eating disorder in ADSW of Asian/Pacific Islander race (AOR=0.61, CI: 0.43-0.85), Black race (AOR=0.74, CI: 0.62-0.89), and in the Air Force (AOR=0.82, CI: 0.68-1.00) compared to those of White race and in the Army. No significant associations were observed for age, marital status or rank (p's >0.05).

Table 4: Unadjusted and adjusted logistic regression results for odds of an eating disorder, FY 2018-2019.

Effect	Unadjusted			Adjusted			
	OR	95% CI	p-value	OR	95% CI		p-value
Age group (years)							
18 to 24 (ref)	1	1	1	-	1	1	1	-
25 to 34	0.89	0.76	1.05	0.1525	0.88	0.71	1.09	0.2283
35 to 44	0.98	0.8	1.2	0.8436	0.93	0.69	1.24	0.6092
45 to 54	0.63	0.39	1.01	0.0553	0.62	0.36	1.07	0.0837
55 and older	0.83	0.21	3.35	0.7975	0.83	0.2	3.55	0.805
Race							
White (ref)	1	1	1	-	1	1	1	-
Black	0.84	0.71	0.99	0.0412	0.74	0.62	0.89	0.001
Asian/Pacific Islander	0.6	0.43	0.84	0.0032	0.61	0.43	0.85	0.004
American Indian/ Alaskan Native	0.62	0.28	1.38	0.241	0.56	0.25	1.26	0.1632
Other	0.89	0.62	1.28	0.5291	0.83	0.57	1.2	0.31
Marital status							
Married (ref)	1	1	1	-	1	1	1	-
Unmarried	1.15	0.99	1.34	0.0682	0.86	0.74	1.02	0.0763
Service							
Army (ref)	1	1	1	-	1	1	1	-
Air Force	0.9	0.76	1.08	0.2727	0.82	0.68	1	0.0468
Navy	1.28	1.07	1.53	0.0083	1.11	0.91	1.35	0.2945
Marine Corps	1.28	0.99	1.66	0.0558	1.3	1	1.7	0.0526
Rank							
Junior Enlisted	1.23	0.8	1.89	0.3558	0.93	0.55	1.57	0.7916
Senior Enlisted	1.3	0.84	2.01	0.2458	1.06	0.65	1.72	0.8289
Junior Officer	1.04	0.66	1.66	0.8533	0.88	0.53	1.47	0.6237
Senior Officer (ref)	1	1	1	-	1	1	1	-
Other	1.68	0.95	2.96	0.0756	1.33	0.57	3.08	0.5105
BMI category							

Underweight	4.52	2.97	6.87	<0.0001	4.48	2.89	6.95	<0.0001
Healthy (ref)	1	1	1	-	1	1	1	-
Overweight	0.9	0.78	1.05	0.1748	0.86	0.67	1.11	0.2396
Obese	2.32	1.95	2.77	<0.0001	2.21	1.57	3.11	<.0001
BMI Body composition status								
Exceeds max BMI standards	1.46	1.27	1.68	<0.0001	1.28	1	1.64	0.0462
Borderline BMI*	0.64	0.53	0.787	<0.0001	0.82	0.65	1.03	0.0911
Below BMI standards	1	1	1	-	1	1	1	-

Note: Borderline BMI status was included in a separate multivariate model from below/exceeds max BMI standards due to overlap between the two variables. ADSW: Active Duty Service Women; BMI: Body Mass Index.

Discussion

This cross-sectional study identified 161,209 ADSW with a recorded BMI from FY 2018-2019 serving in the US Army, Air Force, Navy and Marine Corps. Most ADSW, 61% were below the maximum service-specific BMI standards. Prevalence of eating disorder diagnosis was low at 0.5%. The highest prevalence of eating disorder diagnosis for each category was in ADSW of white race, unmarried, serving in the Army and of junior enlisted rank. Odds of an eating disorder diagnosis were increased for ADSW who were underweight or obese and no association was found between a borderline service-specific BMI and eating disorder diagnosis.

Prevalence of eating disorders was low in this study at 0.5% compared to some prevalence ranges of 2%-13.5% in civilian populations [1,2]. However, when limiting the comparison to studies using claims data for identification, our study is in line with civilian estimates of 0.3% and military estimates of 0.6%. The differences in estimates are important to note when studying prevalence of eating disorders. Using medical claims for identification has the added benefit of increased specificity. An alternate approach to identification is using self-report assessments to ensure sensitivity but then following up with interview assessments to confirm diagnoses. Studies using this two-stage approach report similar estimates of 0.2%-1.7% in civilian populations [1,3].

There is a pervasive belief that military weight standards may contribute to increased risk factors for disordered eating behaviors around the time of height and weight measures and tape tests. Several studies have investigated this hypothesis and found increased prevalence near testing periods [12,21]. One study of active-duty personnel assigned to a Navy hospital had prevalence ranging from 5%-18%, with diet pills, diuretics, and laxatives being the most common behaviors. However, this study was self-report survey based and the response rate was low which could skew results [21]. In a study published by Antczak and colleague in 2008, the Marines were the majority (66%) of

anorexia nervosa diagnosis, and females, specifically White females, had a higher incidence of eating disorders [22]. Our study showed a similar trend in prevalence of eating disorder diagnoses among White females (62%), however, service in the Marine Corps did not yield a significant finding when comparing with other branches of service.

While our study did not assess the diagnosis around a testing period, we did compare BMI as recorded in the medical record to the service-specific BMI standards and found no association between a borderline BMI category and an eating disorder diagnosis. Overall, the BMI category with the largest risk for an eating disorder was ADSW who were underweight suggesting that they may have a chronic condition. A study by Carlton et al. discussed the idea that some new recruits may present to training with pre-existing subclinical disordered eating attitudes and behaviors despite being examined at the Military Entrance Processing Station (MEPS) [21]. We cannot be sure whether the ADSW in our study had an eating disorder prior to joining the armed forces or if they developed one during their service time.

The DoD as a whole has undergone a complete overhaul of the physical fitness and body composition program brought on by DoD instruction 1308.03 in 2022 in an effort to improve the health and well-being of service members [23]. The new BMI standard is a maximum of 27.5 which was the maximum for the Air Force in this study. In recent years, the Air Force and Army have adjusted body compositions measurements for their tape test policies [24,25]. Additionally, the Army and Marines Corps have implemented directives where soldiers and Marines who score at a certain level on physical fitness tests are exempt from body composition assessment [25,26]. Body composition requirements are important to maintain a ready force. While some service members may engage in risky behaviors to meet body composition requirements, our study demonstrates that ADSW with a borderline BMI measurement are not at increased risk for eating disorder diagnosis. Increasing the body composition maximum limits as the services have done can allow service members to gain muscle mass to meet physical

fitness requirements. Follow on research should be conducted to determine which body composition standards are appropriate for ADSW to achieve the physical fitness requirements of their service branch, which was a recommendation in a Defense Health Board report discussing ADSW's health care services [27].

Conclusion

Our study found no association between body composition standards of the services and disorder eating diagnosis among ADSW. The highest risk for eating disorders occurred in ADSW who were underweight which could suggest these individuals have a chronic condition. Future research should examine how nutritional education programs can be designed in initial entry training to address unhealthy eating attitudes and behavior to identify those who may be entering into the service with an underlying condition.

Limitations

This study had several limitations. The use of claims data has the potential for coding errors and inadequate specificity for a condition. Further, we did not capture undiagnosed disordered eating behavior. An eating disorder diagnosis may be stigmatized with negative career impacts and ADSW may not seek professional care for their condition. Additionally, this study does not capture data for any healthcare received outside of the TRICARE benefit.

Disclaimer

The contents of this publication are the sole responsibility of the authors and do not necessarily reflect the views, assertions, opinions or policies of the Uniformed Services University of the Health Sciences (USUHS), the Henry M Jackson Foundation for the Advancement of Military Medicine, Inc. (HJF), the Department of Defense (DoD), or the Departments of the Army, Navy, or Air Force. Mention of trade names, commercial products, or organizations does not imply endorsement by the U.S. Government.

Acknowledgements

None

Competing Interests

The authors have no conflicts of interest.

References

1. Galmiche M, Dechelotte P, Lambert G, Tavolacci MP (2019) Prevalence of eating disorders over the 2000-2018 period: A systematic literature review. Am J Clin Nutr 9:1402-1413.

2. Udo T, Grilo CM (2018) Prevalence and correlates of DSM-5-defined eating disorders in a nationally representative sample of U.S. adults. Biol Psychiatry 84:345-354.

3. Touma DA, Quinn ME, Freeman VE, Meyer EG (2022) Eating disorders in U.S. active duty military members and veterans: A systematic review. Mil Med 2022:usac180.

4. Brien KM, Whelan DR, Sandler DP, Hall JE, Weinberg CR (2017) Predictors and long-termn health outcomes of eating disorders. PLoS One 12:e0181104.

5. Rijkers C, Schoorl M, Van HD, Hoek HW (2019) Eating disorders and posttraumatic stress disorder. Curr Opin Psychiatry 32:510-517.

6. Ward ZJ, Rodriguez P, Wright DR, Austin SB, Long MW (2019) Estimation of eating disorders prevalence by age and associations with mortality in a simulated nationally representative US cohort. JAMA Netw Open 2:e1912925.

7. Streatfeild J, Hickson J, Austin SB, Hutcheson R, Kandel JS, et al. (2021) Social and economic cost of eating disorders in the United States: Evidence to inform policy action. Int J Eat Disord 54:851-868.

8. (2021) Demographics profile of the military community. Military One Source.

9. Williams VF, Stahlman S, Taubman SB (2018) Diagnoses of eating disorders, active component service members, U.S. Armed Forces, 2013-2017. MSMR 25:18-25.

10. Bodell L, Forney KJ, Keel P, Gutierrez P, Joiner TE (2014) Consequences of making weight: A review of eating disorder symptoms and diagnoses in the United States military. Clin Psychol (New York) 21:398-409.

11. Bartlett BA, Mitchell KS (2015) Eating disorders in military and veteran men and women: A systematic review. Int J Eat Disord 48:1057-1069.

12. McNulty PA (2001) Prevalence and contributing factors of eating disorder behaviors in active duty service women in the Army, Navy, Air Force, and Marines. Mil Med 166:53-58.

13. Clark LL, Taubman SB (2016) Update: Diagnoses of overweight and obesity, active component, U.S. Armed Forces, 2011-2015. MSMR 23:9-13.

14. Schoenfeld AJ, Kaji AH, Haider AH (2018) Practical guide to surgical data sets: Military health system tricare encounter data. JAMA Surg 153:679–680.

15. Wheat JE, Khan M, Banaag A, Vaccaro C, Greer JA, et al. (2022) Prevalence of pelvic floor disorders in United States active-duty service women seeking medical care. Female Pelvic Med Reconstr Surg 28:e195-e200.

16. Korona-Bailey J, Banaag A, Nguyen DR, Pasieka H, Koehlmoos TP (2023) Free the bun: Prevalence of alopecia among active duty service women, fiscal years 2010-2019. Mil Med 188:e492-e496.

17. (2013) Feeding and eating disorders. In: Diagnostic and Statistical Manual of Mental Disorders (DSMR). (5th ed), American Psychiatric Association, India: 29-54.

18. (2019) Department of the Navy. Marine Corps order 6110.3A Change-3. Washington DC. Department of the Defense.

19. (2016) NAVADMIN 178/15. Department of the Navy.

20. (2013) The army body composition program. Department of the Army.

21. Carlton JR, Manos GH, van Slyke JA (2005) Anxiety and abnormal eating behaviors associated with cyclical readiness testing in a naval hospital active duty population. Mil Med 170:663-667.

22. Antczak AJ, Brininger TL (2008) Diagnosed eating disorders in the U.S. Military: A nine-year review. Eat Disord 16:363-377.

23. (2022) DoD Instruction 1308.03 DoD physical fitness/body composition program. Department of Defense.

24. (2023) Department of the Air Force, Washington DC. Department of Defense.

25. (2023) Army body fat assessment exemption for Army combat fitness test score. APD.

26. (2022) Forthcoming changes to the body composition program. MARADMINS.

27. (2020) Active Duty Women's Health Care Services. Defense Health Board.