

Weight Stigma Among Active Duty U.S. Military Personnel With Overweight and Obesity

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The rate of overweight and obesity in the U.S. military has tripled in the past 15 years, and the majority of service members are now overweight or obese. To date, however, there is no research on weight stigma within the uniformed services. As weight stigma in civilians is associated with adverse consequences, and service members are subject to strict weight standards that may promote stigma, it is vital to assess the presence of weight stigma within the U.S. military. We therefore assessed 119 active duty service members with overweight and obesity (70% male; 67% White; $M \pm SD$ age = 31.28 ± 7.55 ; $M \pm SD$ body mass index [kg/m^2] = 29.84 ± 1.97) who completed baseline self-report assessments of mood, psychological functioning, and weight stigma prior to participation in a randomized controlled obesity prevention program. Nearly half of respondents reported weight stigma within the military. Adjusting for age, race, sex, height, and body fat percentage, weight stigma within the military was associated with depressive symptoms ($p < .001$); maladaptive coping behaviors ($p < .001$); compensatory behaviors ($p < .001$); eating in response to anxiety, anger, and depression ($ps < .05$); and weight bias internalization ($p = .03$). Weight stigma was reported by nearly half of service members with overweight and obesity, and the experience of weight stigma within the military was associated with harmful thoughts and behaviors, above and beyond the contribution of body composition. Given these preliminary findings, stigma reduction efforts within the uniformed services may be warranted.

Keywords: military, weight stigma, obesity

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Similar to the general population (Flegal, Kruszon-Moran, Carroll, Fryar, & Ogden, 2016), the U.S. military is also facing unprecedented rates of overweight and obesity (Armed Forces Health Surveillance Center, 2011a). In fact, the prevalence of overweight and obesity in the military has tripled in the past 15 years (Armed Forces Health Surveillance Center, 2011a; Bray et al., 2009) and the majority of military personnel are now either overweight or obese (Barlas, Higgins, Pflieger, & Diecker, 2013; Reyes-Guzman, Bray, Forman-Hoffman, & Williams, 2015). Consequently, a threefold increase has been observed in the number of active duty service members with at least one obesity-related comorbidity between 1998 and 2010 (Armed Forces Health Surveillance Center, 2011a). Overweight and obesity in the military are associated with occupational consequences observed at both individual and mission-wide levels (Armed Forces Health Surveillance Center, 2011b); service members who fail to meet weight standards show significantly higher rates of absenteeism and reduced productivity compared with their lean counterparts (Dall et al., 2007; Sanderson, Clemes, & Biddle, 2011). As military personnel are required to meet weight and fitness standards for promotion and retention, overweight and obesity within the armed services are associated with increased risk of early discharge from the military (Armed Forces Health Surveillance Center, 2011b; Dall et al., 2007; Packnett, Niebuhr, Bedno, & Cowan, 2011), thereby potentially contributing to a reduction in force.

The Department of Defense emphasizes that a healthy body composition is integral to both physical fitness and military appearance (Bray et al., 2009). Yet a significant proportion of service members report difficulty meeting weight and/or body fat standards, signaling a need for greater attention to the health and fitness of our service members. Service members who fail to “make weight” at their fitness evaluation may be placed on a mandatory weight management program with a strict timeline by which they are expected to demonstrate satisfactory progress (defined as either a monthly loss of 3 to 8 pounds or 1% reduction in body fat; Department of the Army, 2013). Personnel who repeatedly fail to meet the standards risk being unable to deploy or reenlist and may face early dis-

charge from service. Given the prevalence of overweight and obesity, the social acceptability of weight stigma, and the cultural emphasis on leanness and fitness, service members with obesity may be particularly vulnerable to weight-based stigmatization.

Research among civilian samples demonstrates that persons with obesity face frequent instances of weight-based stigma, teasing, and discrimination in multiple domains (Puhl, Andreyeva, & Brownell, 2008; Puhl & Heuer, 2009; Seacat, Dougal, & Roy, 2014). Importantly, the experience of weight stigma is associated with a host of harmful outcomes, including increased caloric consumption, eating in secret, reluctance to diet, binge eating, and increased risk of mortality (Ashmore, Friedman, Reichmann, & Musante, 2008; Friedman, Ashmore, & Applegate, 2008; Schvey, Puhl, & Brownell, 2011; Sutin, Stephan, & Terracciano, 2015). Especially relevant to the uniformed services, the experience of weight bias is also associated with lower motivation to exercise and avoidance of physical activity altogether (Vartanian & Novak, 2011; Vartanian & Shaprow, 2008). As a result of the cultural emphasis on fitness and maintaining one’s military appearance, service members are already at considerable risk for body dissatisfaction, compensatory behaviors, unhealthy weight control practices, and disordered eating (Antczak & Brininger, 2008; Forman-Hoffman, Mengeling, Booth, Torner, & Sadler, 2012; Lauder, Williams, Campbell, Davis, & Sherman, 1999; McNulty, 1997a, 1997b, 2001; Tanofsky-Kraff et al., 2013; Warner et al., 2007). However, despite the high prevalence of overweight and obesity within the military, to date, no study has explored weight stigma among active duty military personnel with overweight and obesity. The aims of the current study, therefore, were to assess the experience of weight-based stigma among active duty military personnel and to explore the associations of weight stigma with mood and eating behaviors. We hypothesized that weight stigma would be reported among active duty military personnel with both overweight and obesity, and that the experience of weight stigma within the military would be associated with mood and disordered eating symptoms.

Method

Participants and Procedures

Participants were active duty military personnel participating in a randomized, controlled obesity prevention program at Joint Base Lewis-McChord in Fort Lewis, Washington. Participants were recruited via mailings to local military service members, in-person recruitment methods, electronic advertisements, and posted flyers around Joint Base Lewis-McChord. Individuals were eligible to participate if they were active duty personnel 18 years of age or older who were at-risk for excess weight gain as a result of a personal and/or family history of overweight. Individuals were excluded if they were underweight (body mass index [BMI] <18.5), or if they reported any of the following: a significant chronic illness, use of medications likely to affect body weight or appetite, pregnancy, ongoing weight-loss treatment, a psychiatric condition that would impede adherence to study procedures, or a planned deployment/training in the upcoming 2 months. All measurements and assessments were completed between July 2014 and September 2015 during an in-person baseline visit to the Madigan Army Medical Center. Eligible participants provided written consent. The study was approved by the Uniformed Services University Institutional Review Board and the Madigan Army Medical Center Institutional Review Board.

Anthropometric Measurements

Height was measured to the nearest quarter of an inch using a calibrated stadiometer. Participant weight and body fat percentage were measured using a Tanita BF 350 digital scale. Weight was measured to the nearest tenth of a pound. Participants remained clothed but did not wear shoes. Body fat percentage was measured to the nearest tenth of a percent. Tanita analyzers have compared favorably with dual energy x-ray absorptiometry ($r = .94$; [Jebb, Cole, Doman, Murgatroyd, & Prentice, 2000](#); [Rubiano, Nunez, & Heymsfield, 2000](#)) and demonstrate consistent reliability ([Ihmels, Welk, McClain, & Schaben, 2006](#)). Participant's height and weight were used to calculate BMI (kg/m^2). Abdominal waist circumference

and hip circumference were measured to the nearest quarter of an inch using a cloth tape measure with a spring-loaded handle.

Questionnaires

Demographics. Participants reported their age, sex, race, and ethnicity.

Beck Depression Inventory-II ([Beck, Steer, & Carbin, 1988](#)). The Beck Depression Inventory-II is a widely used 21-item scale that assesses current symptoms of depression. Scores range from 0 to 63; higher scores indicate greater depression. The measure demonstrated excellent reliability in the present sample ($\alpha = .90$).

Stigma in the Military Questionnaire. The Stigma in the Military Questionnaire was adapted from an existing measure of weight stigma ([Puhl, Luedicke, & Heuer, 2011](#)) for the present study. Participants were provided with a list of nine characteristics (e.g., body weight, body shape, gender, race, learning disability) and were asked to indicate, on a 5-point Likert scale, if and how often they are "made fun of, teased, or given a hard time by coworkers or supervisors" on the basis of the target characteristic. Higher scores indicate more frequent experiences of teasing. The scale demonstrated acceptable reliability ($\alpha = .72$).

Experiences and Sources of Weight Stigma Questionnaire. The Experiences and Sources of Weight Stigma Questionnaire is a 26-item measure adapted from an existing measure of weight stigma ([Puhl et al., 2011](#)) for use in military populations by the authors. This scale assesses whether and how often individuals experience various forms of stigma in the military as a result of their weight (e.g., being passed up for promotion because of weight/shape; being made fun of during training/drills). Participants were also provided with a list of eight individuals (e.g., primary care manager, commander, fitness leader) and asked to indicate whether and how often any of these people have teased or mocked them because of their weight. Items are rated on 5-point Likert scale, with higher scores indicating more frequent experiences of stigma. Reliability in the current sample was excellent ($\alpha = .95$).

Coping Responses to Weight Stigma. Coping Responses to Weight Stigma were measured using an adapted version of [Myers and](#)

Rosen's (1999) Coping Responses Inventory. The 18-item measure assesses whether and how often participants use various strategies to cope with weight-related teasing (e.g., "I talked to supportive friends"; "I ate more food"; "I avoided physical activity"). Higher scores reflect greater use of maladaptive coping strategies in response to stigmatizing experiences. This measure demonstrated excellent reliability in the present sample ($\alpha = .92$).

Weight Bias Internalization Scale—Modified (WBIS-M; Pearl & Puhl, 2014). The WBIS-M was administered to assess the degree to which an individual believes that negative weight-based stereotypes apply to him or herself and can be administered to individuals with and without obesity. Higher scores indicate greater internalized weight bias. The WBIS-M demonstrated good reliability in the current sample ($\alpha = .85$).

Emotional Eating Scale (Arnold, Kenardy, & Agras, 1995). The Emotional Eating Scale is a 25-item self-report measure that assesses the urge to cope with negative affect by eating. The Emotional Eating Scale yields a mean score as well as three subscale scores: Anger/Frustration, Depression, and Anxiety. The Emotional Eating Scale demonstrated acceptable to excellent reliability in the present sample (α s = .76 to .93).

Data Analytic Plan

All analyses were conducted using SPSS for Windows, Version 22 (IBM Corp., 2013). Data were examined for outliers, skewness, and kurtosis. Outliers (<8% of data points) were adjusted to fall 1.5 times the interquartile range. Skewed variables were log-transformed to satisfy assumptions of normality. Though lean individuals with a family history of overweight were eligible to participate in the intervention, for the purpose of the present study, those individuals ($n = 8$) were omitted from analyses.

Given that no studies to date have assessed weight stigma in the military, an initial aim was to determine the proportion of respondents who reported at least one stigmatizing experience within the military. To determine this, Likert-scale responses to the Experiences and Sources of Weight Stigma Questionnaire were dichotomized to indicate agreement or disagreement with the items. Individuals were coded as hav-

ing experienced weight stigma in the military if they responded "sometimes," "often," or "very often" to any item querying about either experiences (e.g., denied promotion) or sources (e.g., the person weighing/taping you) of weight stigma in the military. To determine the proportion of individuals who reported coping with stigma with the use of various behaviors, items on the Coping Responses to Weight Stigma Questionnaire were similarly dichotomized.

Multiple regressions were performed to determine the associations of weight-related stigma in the military (as a continuous variable) with indices of psychological functioning after controlling for variables selected a priori (age, sex, race, height, and fat mass). Although controlling for height and body fat should allow for a more precise analysis of obesity and health than BMI, secondary analyses were also conducted controlling for BMI, rather than height and fat mass. As results did not differ, all subsequent analyses include height and fat mass as covariates. To compare individuals with overweight with those with obesity (National Heart, Lung, and Blood Institute, 1998), multivariate analyses of covariance were conducted, controlling for age, sex, and race. Differences were considered significant when p values were ≤ 0.05 . All tests were two-tailed.

Results

One hundred nineteen active duty service members (30% female) with overweight ($29.9 \geq \text{BMI} \geq 25$; 52%) and obesity ($\text{BMI} \geq 30$; 48%) were included. Average age was 31.28 ± 7.55 and mean BMI was 29.84 ± 1.97 (range = 25 to 34). The racial distribution of the sample was 67% White, 15% Black, 4% Asian, 2% Native American, 3% native Hawaiian/Pacific Islander, and 9% "Other" or unknown. The sample was 80% non-Hispanic and 20% Hispanic. Table 1 provides additional demographic information.

Stigma in the Military

Nearly half (49%) of respondents reported that they had experienced at least one instance of stigma within the military based on shape and/or weight. Furthermore, among those reporting stigma in the military based on any attribute, weight (71%) and shape (61%) were

Table 1
Participant Demographics

Measure	Overweight ^a		Obese ^a			<i>F</i>	Total sample			
	<i>n</i>	Valid %	<i>n</i>	Valid %			<i>n</i>	Valid %		
Sex						4.48*				
Male	38	61	45	79			83	70		
Female	24	39	12	21			36	30		
Race						.04				
White	43	71	36	63			79	67		
Black	8	13	10	18			18	15		
Asian	2	3	3	5			5	4		
Native American	0	0	2	3			2	2		
Native Hawaiian	2	3	1	2			3	3		
Multiracial/Other	6	10	5	9			11	9		
Ethnicity						.03				
Hispanic	13	21	11	20			24	20		
Non-Hispanic	49	79	45	80			94	80		
Reported ≥1 instance of weight stigma in the military	26	46	28	53		.55	54	49		
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>F</i>	<i>M</i>	<i>SD</i>	<i>n</i>
Age	31.08	7.97	62	31.49	7.13	57	.09	31.28	7.55	119
BMI	28.32	1.29	62	31.49	1.04	57	215.84**	29.84	1.97	119
Fat mass (%)	29.75	6.91	62	31.87	6.41	57	2.97	30.77	6.73	119
Depressive symptoms ^b	10.66	9.30	62	9.53	6.61	57	.58	10.12	8.11	119
Coping behaviors ^b	2.38	.43	58	2.36	.44	52	.04	2.37	.43	110
Weight bias internalization ^b	3.75	1.35	58	3.38	1.27	53	2.14	3.57	1.32	111

Note. BMI = body mass index.

^a Assigned according to the National Heart, Lung, and Blood Institute, 1998 standards (obese: BMI ≥ 30; overweight: 29.9 ≥ BMI ≥ 25). ^b Higher values indicate greater depressive symptoms, maladaptive coping, and weight bias internalization. Statistical test conducted: one-way analysis of variance.

* $p < .05$. ** $p < .001$.

the two most commonly reported stigmatized attributes. Nearly one third (32%) of the sample reported that others assume they are lazy or out of shape; 19% have been laughed at, mocked, or given a weight-related nickname as a result of their weight/shape; and 21% have been told that they need “more willpower.” One quarter (24%) of respondents reported punitive measures, such as multiple sessions of physical training per day and denial of awards or career advancement opportunities because of shape or weight. Nearly one third (32%) of participants reported coping with weight stigma in the military by using unhealthy weight control behaviors, for instance, purging, diet pills, saunas, body wraps, fasting, waist trainers, and liposuction. Weight stigma in the military was not associated with percentage body fat ($r = -.02$, $p = .82$), waist-to-hip ratio ($r = .13$, $p = .17$), weight status ($F = .92$, $p = .34$), sex ($F = .82$, $p = .37$), or race ($F = 1.34$, $p = .25$).

Weight Stigma in the Military and Psychological Functioning

Accounting for age, sex, race, height, and body fat percentage, experiences of weight stigma within the military were positively associated with depressive symptoms ($\beta = .39$, $p < .001$) and maladaptive behaviors used to cope with stigma (e.g., consuming more food, avoiding physical activity; $\beta = .48$, $p < .001$). Weight stigma within the military was significantly associated with the use of compensatory behaviors to cope with stigma (e.g., laxative misuse, purging, fasting; $\beta = .35$, $p < .001$), and with eating in response to anger/frustration, anxiety, and depression (β s = .21 to .34, $ps < .05$). Adjusting for covariates, experiences of weight stigma within the military were positively associated with weight bias internalization ($\beta = .21$, $p = .03$; see Figure 1).



Qualitative Data

Participants were also given the opportunity to write in specific experiences of weight-related consequences they had faced in the military and to describe the impact their weight/shape has had on their military career. Fifty-one respondents elected to provide qualitative data, which included four domains: weight-related nicknames, denial of promotion/career advancement opportunities, and consequences of weight status both at work and at home. Of these 51 respondents, 8% reported weight-related nicknames (e.g., “fatty,” “gorda”), 39% cited examples wherein their weight resulted in the denial of a promotion/opportunity/award (e.g., “missed out on an award,” “cannot be promoted”), 75% described weight-related consequences at work (e.g., “physical training 3× per day,” “weigh ins before and after work”), and 25% described weight-related consequences at home (e.g., “lowered self-esteem,” “spouse upset by career impact”).

Discussion

In this study of active duty service members with overweight and obesity, nearly one half of respondents reported at least one instance of shape- or weight-based stigma in the military (e.g., being made fun of during drills or training exercises). Furthermore, shape- and weight-based stigma were the two most commonly reported types of stigma among respondents. One-third of participants reported responding to weight stigma by using unhealthy methods to lose weight quickly, such as diet pills, body wraps, and saunas. Weight-based stigma in the military was associated with depressive symptoms and maladaptive behaviors to cope with stigma, such as avoidance of physical activity and overeating. Weight stigma in the military was also associated with the use of compensatory behaviors to cope with the stigma of being

Figure 1. Association of stigma in the military with psychological indices. Stigma in the military was significantly associated with (A) depressive symptoms ($p = .001$), (B) maladaptive coping behaviors ($p < .001$), (C) compensatory behaviors ($p = .001$), and (D) weight bias internalization ($p = .03$). Unstandardized residuals are shown, controlling for covariates as specified in the Method section.

overweight (e.g., laxative misuse and purging), eating in response to negative affect, and the internalization of weight bias, after controlling for potential confounds, including body composition and sex.

These data indicate that service members with overweight and obesity are vulnerable to weight stigma, and that the experience of weight stigma in the military is associated with adverse psychosocial correlates, including depressive symptoms and compensatory behaviors. Weight stigma in the military was not associated with weight status or fat mass, indicating that weight-based teasing may be directed at individuals irrespective of degree of overweight. This finding is in accordance with prior research among civilians (Puhl, Moss-Racusin, Schwartz, & Brownell, 2008) indicating that individuals with even modest overweight may be as vulnerable to weight stigma as their counterparts with obesity. The lack of association between stigma and degree of overweight may also reflect the military's emphasis on a lean and muscular physique, such that even individuals who deviate slightly from these norms become targets of stigma. Alternatively, this lack of association may result from the fact that the sample comprised only individuals with a modest degree of overweight/obesity; it is possible that in a more diverse sample inclusive of lean individuals and individuals with a higher degree of obesity, weight stigma would be associated with body composition. In addition, the lack of sex differences reveals that male and female service members may be equally susceptible to weight-based stigma within the uniformed services. This lack of sex difference is in accordance with some (Carr & Friedman, 2005; Friedman et al., 2005; Puhl, Moss-Racusin, et al., 2008), but not all (Hebl & Turchin, 2005; Puhl, Andreyeva, et al., 2008), previous research. Results underscore the importance of assessing weight stigma among service members, irrespective of sex and degree of overweight. Given that service members may be vulnerable to stigma based upon other attributes (e.g., depression, eating pathology; Ben-Zeev, Corrigan, Britt, & Langford, 2012), the current research identifies another way in which service members may be at-risk for stigma and victimization.

Weight-related comorbidities among military personnel may compromise national defense

and preparedness, and there is a legitimate need for a fit force; thus, the current military fitness standards are not without basis, and efforts to promote weight loss and fitness within the U.S. military may be justified. However, as many respondents described ways in which their weight resulted in negative occupational consequences (e.g., denial of career advancement opportunities, frequent weighing and taping), and nearly one third reported the use of unhealthy weight-control behaviors to cope with weight stigma, it may be worth examining the current standards and assessing whether they are reasonable and warranted given the increasingly accepted position that body weight is not a reliable proxy for health or fitness level (Bacon & Aphramor, 2011). A Health at Every Size framework (Bacon & Aphramor, 2011) might prove advantageous by reducing the emphasis on body weight and shape, while still recognizing the need for a healthy and fit force. In addition, it may be important to provide supportive programs for service members at risk of failing fitness tests, and to treat service members who fail to meet standards with dignity and not derision. If implemented respectfully, it may be less likely that service members view the current practices (e.g., remedial physical training) as stigmatizing.

A wealth of existing research indicates that weight stigma not only does not motivate weight loss, but that it actually promotes obesogenic processes and behaviors (Schvey et al., 2011; Sutin et al., 2015; Tomiyama et al., 2014; Vartanian & Novak, 2011; Vartanian & Shaprow, 2008). Military service members face enormous pressure to be fit and are already at high risk for body dissatisfaction and unhealthy weight control behaviors (Carlton, Manos, & Van Slyke, 2005; Jacobson et al., 2009; Lauder et al., 1999; McNulty, 1997a, 1997b, 2001); thus, they may be particularly vulnerable to the harmful effects of weight stigma. Therefore, it will be critical to determine how best to address excess weight among service members in order to promote health and fitness while ensuring that persons with overweight and obesity are not subjected to weight-based victimization.

Given that weight stigma is associated with numerous harmful outcomes among civilian populations (Puhl & Heuer, 2009, 2010; Sutin et al., 2015), it will be important to assess the causal relationship between stigma and health

indices in military populations. If weight stigma directed at service members is found to predict unhealthy outcomes, then stigma reduction efforts within the uniformed services may be warranted. For instance, commanders and those weighing and taping service members may be advised to use appropriate language and to avoid weight-related comments and pejorative terms for excess weight. It may also be recommended that stigma and weight-based teasing are eliminated from physical training and fitness drills, and that weight is addressed sensitively among service members of all weight strata. Additionally, punitive measures, such as disciplinary action and denial of career advancement opportunities, may have adverse consequences for those in uniform; thus, these common practices warrant further evaluation.

As weight stigma remains the last socially acceptable form of bias, and was reported by nearly half of respondents in the current sample, it may be necessary to implement antibullying policies and to provide education on the complex etiology of obesity to reduce blame on the individual (Crandall, 1994). As weight-based teasing may ostensibly be used to motivate service members to lose weight and exercise, it will be important to provide education to service members and commanders about the potentially harmful consequences of weight stigma and to impart the awareness that weight stigma has an iatrogenic effect on those targeted. Finally, the effectiveness of military weight-loss strategies should be thoroughly assessed, and adaptive methods to confront and cope with stigma should be provided to our service members.

Study strengths include the use of measured height, weight, and fat mass. The study sample is also somewhat representative of the U.S. military (Military One Source, 2014) and thus includes a preponderance of men, who are typically underrepresented in studies pertaining to eating and weight pathology (Pagoto et al., 2012; Striegel, Bedrosian, Wang, & Schwartz, 2012). Limitations include the cross-sectional nature of the data, which precludes any causal interpretation. Furthermore, our primary variables of interest, including weight-based teasing, were obtained via self-report. Our sample also consisted exclusively of treatment-seeking adults with either overweight or obesity; thus, results may not be generalizable to non-

treatment-seeking service members. More specifically, systematic differences may exist between those in our sample who opted to enroll in a weight-gain prevention trial and service members with overweight who do not seek out elective treatment. For instance, the former may have experienced more weight stigma or greater unit pressure to lose weight compared with the latter. Results should be considered in light of this possible limitation.

As the current study found significant associations between weight stigma in the military and a host of unhealthy behaviors, including eating in response to negative affect, avoidance of exercise, and compensatory behaviors, longitudinal studies of the effects of weight-based stigmatization on the psychological functioning, eating behaviors, and weight status of service members may be warranted. In civilian populations, weight stigma is predictive of body dissatisfaction and eating pathology (Ashmore et al., 2008; Friedman et al., 2008; Friedman et al., 2005), and military populations are already vulnerable to eating (Bartlett & Mitchell, 2015) and mood (Department of Defense, 2008) disturbances, likely a result of weight limits, frequent fitness testing, and the stress associated with military service. Thus, service members may be especially vulnerable to the adverse consequences of weight stigma. Extant research has also demonstrated links between weight-based stigma and weight gain (Hunger & Tomiyama, 2014), metabolic dysfunction (Tsenkova, Carr, Schoeller, & Ryff, 2011), and mortality (Sutin et al., 2015); thus, future research is needed to assess the relationship between weight stigma and indices of health among service members. As the health of the military affects the well-being and safety of the nation, it will be critical to better understand the effect of weight stigma on the health, fitness, and morale of our service members.

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