

Accession Medical Waivers and Deployment Duration in the U.S. Army

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ABSTRACT To examine the performance of active duty U.S. Army personnel with accession medical waivers during combat deployments, the deployment duration and likelihood of early return from theater for medically waived ($n = 18,093$) and medically qualified ($n = 250,209$) personnel deploying between September 2001 and March 2011 were determined. The mean and median deployment duration for waived men (309.4 ± 107.5 and 346) and for waived women (291.8 ± 115.3 and 341) was not shorter than for medically qualified men (304.6 ± 112.1 and 346) and women (289.5 ± 116.3 and 337). When adjusted for other accession factors in a multivariate linear regression model, neither waived men ($p = 1.00$) nor women ($p = 0.7713$) had significantly shorter deployments. In a case-control analysis, 24,369 men and 3,094 women were defined as having a short deployment. Multivariate logistic regression found that medically waived men (odds ratio [OR] = 0.87, 95% confidence interval [CI] = 0.82–0.92) and women (OR = 1.02, 95% CI = 0.87–1.19) were not more likely to have shorter deployments compared to medically qualified individuals. These findings show that those with an accession medical waiver were not more likely to have shorter deployments or more likely to return early from deployment than those without waivers.

INTRODUCTION

Illness or injury in military personnel can lead to lost training time, premature discharge (attrition), and delayed deployment, negatively impacting force readiness.¹ Medical attrition in U.S. Army recruits has been shown to be correlated with poor performance on physical fitness tests, musculoskeletal injuries during basic training, and cigarette smoking.^{2–3} Other risk factors for attrition from military service include divorced/separated marital status,³ lack of high school diploma, low aptitude test scores, and female sex.⁴ A review of initial entry training discharges at a U.S. Army training base found that reasons for attrition were often multifactorial, and that medical and psychiatric conditions were commonly present among individuals discharged for administrative causes.⁵

Pre-enlistment screening to determine eligibility for military service includes extensive physical, medical, and aptitude testing.⁶ Military applicants who do not meet medical accession standards because of medical conditions identified during their pre-enlistment medical examination are considered medically disqualified.⁷ Medically disqualified applicants may seek an accession medical waiver for conditions that are unlikely to affect their ability to perform military duties.⁶ The most common medically disqualifying conditions requiring a waiver include vision disorders of refraction

and accommodation, hearing loss, and attention deficit disorder/hyperactivity disorder.⁸ Although psychiatric conditions such as attention deficit disorder/hyperactivity disorder, anxiety disorders, and depression continue to rank among the top 20 medically disqualifying pre-enlistment diagnoses, the U.S. Army began restricting accession medical waivers for certain psychiatric disorders in 2009, specifically mood disorders, likely leading to fewer psychiatric waivers since that time (Office of the Deputy Chief of Staff G-1: Suspension of enlistment waivers for certain mental health conditions. Department of the Army, Washington DC, policy memo, 29 June 2009).

Enlistees with accession medical waivers have slightly higher overall attrition rates compared to those without pre-enlistment medical conditions.⁴ Survival analyses of new recruits with accession medical waivers have shown that risk of attrition varies by specific waived medical condition. Individuals with waivers for knee injuries,⁹ hearing deficiencies,¹⁰ and spinal curvature¹¹ have small but statistically significant increases in attrition compared to medically qualified recruits. Studies of waived enlistees with asthma,¹² attention deficit disorder/hyperactivity disorder,¹³ myopia,¹⁴ and recurrent headaches¹⁵ found no difference in attrition compared to medically qualified individuals. These studies suggest that differences in attrition risk between waived and medically qualified enlistees are small and have a limited operational impact on success in basic training and early military career.

Recent studies have also assessed the impact of medical conditions relative to combat deployments. Longer deployment duration and unexpectedly extended deployments have been shown to be associated with adverse health effects, including both psychological distress and physical symptoms.^{16,17} In general, medical diagnoses before deployment, including hospitalizations and mental disorders, are strong

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predictors of postdeployment diagnoses.^{18–21} However, no studies have examined the impact of pre-enlistment medical diagnoses on deployment or postdeployment health.

Although previous studies have shown that most individuals receiving medical waivers were not prematurely discharged from service, little is known about how well individuals with accession medical waivers perform during combat deployments. Limitations in the availability of existing surveillance health care and administrative data during deployment prevent the assessment of waived enlistees' actual performance during deployment, but it is reasonable to assume that interference with their duties or performance that is related to medically waived conditions could result in a shorter duration of deployment or in an increased likelihood of early return from deployment. This study was undertaken to ascertain if U.S. Army personnel with accession medical waivers had shorter deployments, or were more likely to return from deployment early, compared to medically qualified recruits.

METHODS

Study Design

This epidemiologic analysis of active U.S. Army personnel studied accession medical factors associated with shortened deployment length from September 2001 to March 2011 using linear and logistic regression methods. Accession medical waivers were the primary risk factor of interest.

Data Sources

Accession Medical Examination

Department of Defense Instruction 6130.03 outlines specific medical diagnoses, or history of particular medical conditions, considered disqualifying for military service.⁷ These accession medical standards were developed to maximize accession of qualified recruits by minimizing unnecessary medical disqualifications and to reduce early discharge by disqualifying applicants with high risk medical conditions.⁶ The U.S. Military Entrance Processing Command provided data on applicant medical examinations, including disqualifying medical conditions, screening test results, aptitude scores, educational achievement, height and weight measurements, and demographic information.

Accession Medical Waiver

Applicants with disqualifying medical conditions identified during their initial medical examination may seek an accession medical waiver for conditions that are unlikely to affect their ability to perform military duties.⁶ Medical accession waivers are granted by a service-specific waiver authority, who may request additional medical history and documentation.^{1,22} The decision to approve or deny an accession medical waiver is made on a case-by-case basis depending on the severity of the medical condition and the current needs of each service.²² The U.S. Army Recruiting Command is

responsible for approving accession medical waivers in Army recruits, and provided medical waiver application data for this study. Medical waiver data included waived medical conditions and waiver date.

Deployment and Casualty Data

Administrative records pertaining to deployment and casualty events were provided by the Defense Manpower Data Center. These data included start and end dates for deployment as well as dates for wounded-in-action or killed-in-action events.

Study Population

The study population consisted of active duty U.S. Army enlistees who deployed for the first time to Operation Iraqi Freedom or Operation Enduring Freedom between September 2001 and March 2011 and returned before March 2012 ($n = 268,302$). Soldiers who were wounded-in-action or killed during their deployment were excluded, to exclude deployments shortened due to battle injuries or death. Since deployments generally do not exceed 15 months,¹⁷ outliers in this population who deployed for more than 15 months were also excluded.

Enlistees in the study were categorized as having an accession medical waiver if they had a medical waiver consideration reviewed by the U.S. Army waiver authority within 2 years of accession to allow for the Delayed Entry Program (i.e., high school juniors and periods when the Army is in excess of its recruiting goals). Enlistees who did not have an accession medical waiver record were categorized as medically qualified.

Statistical Analysis

The primary risk factor of interest was accession medical waiver status. Other accession factors included age, race, body mass index category (BMI), and Armed Forces Qualification Test category (AFQT), which is a measure of cognitive aptitude and educational achievement. BMI (kg/m^2) was divided into three categories: underweight (<18.5), normal/overweight ($18.5\text{--}29.9$), and obese (≥ 30).²³ All analyses were stratified by sex.

Deployment duration was measured in days using the start and return dates and was reported as the mean (\pm standard deviation) and median. We compared average deployment lengths for waived and medically qualified individuals using multivariate linear regression, adjusting for other accession factors. Analyses were conducted on both raw and squared transformed deployment length data because of non-normality. To test for shorter deployment duration, the statistical test was one-tailed, with a p value of 0.05 indicating statistical significance.

A case-control study design was also used to determine if waived individuals were more likely to have a short deployment compared to medically qualified individuals. Because

TABLE I. Demographics of Study Population, Stratified by Sex

Characteristic	Men (N = 237,739)		Women (N = 30,563)	
	n	%	n	%
Medical Waivers				
Medically qualified	221,601	93.2	28,608	93.6
Medically Waived	16,138	6.8	1,955	6.4
Age at Accession				
17–20	147,526	62.1	19,436	63.6
21–25	67,961	28.6	7,770	25.4
26–30	15,982	6.7	2,133	7.0
>30	6,270	2.6	1,224	4.0
Race				
White	193,272	81.3	19,232	62.9
Black	29,841	12.6	8,948	29.3
Other	14,626	6.2	2,383	7.8
BMI				
Underweight	4,209	1.8	982	3.2
Normal/Overweight	200,506	84.3	28,814	94.3
Obese	33,024	13.9	767	2.5
AFQT				
93–99	13,967	5.9	891	2.9
65–92	83,409	35.1	7,899	25.8
50–64	64,060	27.0	8,080	26.4
30–49	71,492	30.1	12,823	42.0
11–29	4,811	2.0	870	2.9
Education				
Below HS Senior	1,405	0.6	53	0.2
HS Diploma	206,115	86.7	25,690	84.1
Some College	21,344	9.0	3,144	10.3
Bachelor's and Above	8,875	3.7	1,676	5.5

HS, high school.

no a priori definition of short deployment exists, individuals were stratified by year of deployment, and then categorized into deciles of deployment duration within each year. Individuals in the lowest 10th percentile were defined as cases with short deployments. The 50th to the 90th percentiles for each year were defined as controls. To maximize contrast between cases and controls, individuals in the 20th to 40th percentile were excluded from these analyses. Individuals above the 90th percentile were also excluded as these values were extreme and likely represented atypical deployments. Multivariate logistic regression models were used to determine the relative odds of having a short deployment for waived and nonwaived individuals, adjusting for other accession factors. The null hypothesis was that waived individuals did not have shorter deployment durations nor were more likely to return from deployment early. All statistical analyses were performed using SAS version 9.2 (SAS Institute, Cary, North Carolina).

RESULTS

A total of 237,739 men and 30,563 women meeting the inclusion criteria deployed for the first time between September 2001 and March 2011 (Table I). Those excluded from the study population included 7,924 individuals who were wounded-in-action and 1,069 individuals killed during deployment. Approximately 0.5% of the study population was injured in nonbattle-related incidents (N = 1,351). There

TABLE II. Deployment Duration for Accession Factors for Waived and Medically Qualified Individuals, Stratified by Sex

	Men				Women			
	Medically Qualified		Medically Waived		Medically Qualified		Medically Waived	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
AFQT								
93–99	293.5	342	302.3	344	291.6	341	295.2	344.5
65–92	300.7	345	307.4	346	293.4	340	294.4	335
50–64	302.8	345	308.6	346	287.3	336	289.9	343
30–49	310.6	347	314.1	348	287.1	335	289.2	339
11–29	336.1	355	329.3	354	306.7	345	326.6	354
BMI Category								
Underweight	305.5	346	317.4	351	289.0	338	299.7	341
Normal/Overweight	303.3	346	308.6	346	289.0	337	292.1	341
Obese	312.2	348	312.0	347	307.8	345	254.8	293.5
Education								
Below HS Senior	307.0	342	308.7	342	278.2	325	331.8	356.5
HS Diploma	305.5	346	310.7	347	288.6	337	293.8	341
Some College	303.2	345	304.8	345	296.0	340	279.9	332
Bachelor's and Above	286.6	338	298.9	340	290.7	339	289.2	335
Race								
White	304.3	346	309.3	347	290.8	339	289.6	340
Black	302.8	345	305.4	345	285.3	334	292.9	339
Other	311.7	348	317.3	347	294.4	339	306.6	345.5
Age at Accession								
17–20	304.4	346	309.6	347	288.0	337	290.7	339
21–25	305.3	346	310.4	346	291.8	338	296.1	342
26–30	303.1	345	307.6	345	294.2	339	279.1	335
>30	306.3	345	304.8	342	290.1	338	296.6	339

HS, high school.

TABLE III. Difference in Deployment Duration for Accession Factors, by Sex

Accession factor	Men		Women	
	Diff.	p value	Diff.	p value
Waiver Status				
Medically Qualified				
Medically Waived	5.3	1.00	2.0	0.7713
AFQT				
93–99				
65–92	5.0	1.00	2.2	0.8477
50–64	6.9	1.00	–3.1	0.3779
30–49	14.7	1.00	–2.7	0.4164
11–29	39.5	1.00	17.2	0.9999
BMI Category				
Underweight				
Normal/Overweight	–2.4	0.1016	–2.0	0.4167
Obese	5.9	0.9997	13.6	0.9984
Education				
Below HS Senior				
HS Diploma	–2.6	0.256	7.2	0.7147
Some College	–5.2	0.0692	11.2	0.7912
Bachelor and Above	–18.6	<.0001*	5.0	0.6637
Race				
White				
Black	–5.0	<.0001*	–4.6	0.0026*
Other	6.4	1.00	4.3	0.9959
Age at Accession				
17–20				
21–25	2.26	1.00	3.0	0.9996
26–30	1.82	0.9998	3.8	0.997
>30	4.68	1.00	0.9	0.8962

HS, high school; Diff, difference. *Indicates significance at $p < 0.05$ level.

were 16,138 men (6.8%) and 1,955 women (6.4%) with accession medical waivers.

Overall, the mean deployment duration for men was 304.9 (± 111.8) and 289.6 (± 116.2) for women (Table II). Median deployment duration ranged from about 12% to 18% higher than the mean for both men and women, waived and medically qualified, reflecting that deployment lengths were not normally distributed and were skewed to the left. Deployment duration varied by year of deployment for both men and women, with the longest average deployments for those deployed in 2007 and the shortest in 2002.

Unadjusted deployment mean and median duration for waived men (309.4 \pm 107.5 and 346) was not shorter than for medically qualified men (304.6 \pm 112.1 and 346) (Table II). A similar pattern was observed for waived and medically qualified women (mean, 291.8 \pm 115.3 and median, 341; mean, 289.5 \pm 116.3 and median, 337, respectively). For both men and women, by most covariates (except obese and those >30 years, and among women only, those aged 26–30), waived individuals did not have shorter deployments.

Table III shows the average differences in deployment duration for all the accession factors included in the multivariate linear regression models. When adjusted for other accession factors, neither men nor women with accession

medical waivers had significantly shorter deployments than medically qualified men and women. The positive differences for both waived men (5.3) and women (2.0) indicate that they actually had longer deployment durations on average compared to the individuals without waivers. Other factors, including AFQT, BMI, education, race, and age were significantly associated with deployment length for men but not for women. The results were similar for the analysis of transformed data.

In the case-control analysis, there were 24,369 men and 3,094 women defined as cases, and 118,299 men and 15,231 women defined as controls (Table IV). Logistic regression analysis found that having an accession medical waiver was not associated with short deployments for men (OR = 0.87, 95% CI = 0.82–0.92) and was not significantly associated with deployment length among women (OR = 1.02, 95% CI = 0.87–1.19). Among men, AFQT, BMI, education and age at accession and race were significantly associated with shortened deployment; among women, education alone was significantly associated with shortened deployment.

DISCUSSION

The mission of the accession medical waiver process is to identify persons who are initially medically disqualified from

TABLE IV. Adjusted Odds Ratios for Early Return From Deployment, Stratified by Sex

Accession Factor	Men	Women
	OR (95% CI)	OR (95% CI)
Waiver Status		
Medically Qualified	1.00	1.00
Medically waived	0.87 (0.82–0.92)*	1.02 (0.87–1.19)
AFQT		
93–99	1.62 (1.52–1.72)*	1.03 (0.82–1.31)
65–92	1.34 (1.29–1.39)*	0.96 (0.87–1.06)
50–64	1.18 (1.14–1.23)*	0.95 (0.86–1.04)
30–49	1.00	1.00
11–29	0.77 (0.68–0.86)*	0.82 (0.63–1.05)
BMI Category		
Underweight	0.93 (0.83–1.03)	1.01 (0.81–1.26)
Normal/Overweight	1.00	1.00
Obese	0.80 (0.80–0.87)*	0.83 (0.64–1.08)
Education		
Below HS Senior	0.75 (0.61–0.92)*	1.19 (0.49–2.91)
HS Diploma	1.00	1.00
Some College	1.15 (1.10–1.21)*	0.95 (0.83–1.09)
Bachelor and Above	1.46 (1.35–1.57)*	1.07 (0.89–1.29)
Age at Accession		
17–20	1.00	1.00
21–25	0.97 (0.93–1.00)	0.96 (0.83–1.05)
26–30	0.95 (0.89–1.00)	0.90 (0.76–1.06)
>30	0.89 (0.81–0.97)*	1.05 (0.86–1.29)
Race		
White	1.00	1.00
Black	0.94 (0.90–0.99)*	0.98 (0.90–1.07)
Other	0.92 (0.87–0.98)*	0.98 (0.85–1.14)

HS, high school. *Indicates significant odds ratio.

military service, but whose condition is not of such severity as to be likely to interfere with a Soldier's ability to perform military duties, including during deployment to areas of conflict. The findings of this study indicate that once a Soldier with an accession medical waiver deploys, s/he does not deploy for shorter periods of time and is not more likely to return early from theater. Although the mean duration for waived men was significantly longer than for medically qualified, this difference was small and not operationally important. Logistic regression analysis supported the findings from linear regression methods in that those with an accession medical waiver were not more likely to have shorter deployments than those without waivers. Several other factors were associated with shorter deployment duration, including among men, higher AFQT score, and higher educational achievement; and among men and women, black race. Longer deployments were found among men with accession medical waivers and obese accession BMI.

There are a number of potential reasons for our findings, any or all of which may explain our observations. The substantial medical screening that military personnel undergo both at enlistment⁷ and before deployment²⁴ may prevent those at risk of unsuccessful deployment from initially entering the military or from being deployed. It is possible that medically waived enlistees have increased motivation to serve.¹¹ Although it is possible that waived soldiers may be less likely to deploy, all enlistees must complete initial entry and advanced training.⁶ Soldiers who are medically unfit are generally discharged within the first 6 to 12 months of service,^{3,4,8} and thus are not likely to be among the deployed population. Predeployment health assessments (routine medical evaluations to check for medical conditions that may either interfere with a soldier's ability to perform their duties or which cannot be treated in theater²⁴) must be completed before any deployment longer than 30 days, and individuals with medical conditions are not cleared to deploy or must undergo further evaluation through an additional deployment waiver process.²⁴⁻²⁶ If a waived individual can pass all the screening procedures related to enlistment and deployment, then it is likely that they are capable of completing a deployment.

Approximately 4% of deployed Army personnel were medically evacuated from Operation Iraqi Freedom and Operation Enduring Freedom, with a majority of medical evacuations from theater because of nonbattle-related illness or injury.²⁷ Most soldiers medically evacuated from theater do not return to duty.²⁸ The leading causes for medical evacuation combat theater include musculoskeletal disorders, nonbattle injuries, and mental disorders.²⁷⁻²⁸ It is clear that medical conditions diagnosed during deployment, particularly those serious enough to merit medical evacuation, are a significant challenge for force readiness and individual deployment success. Although it has been reported that conditions diagnosed before deployment are generally strong predictors of postdeployment health problems, this study

showed that waived pre-enlistment medical conditions did not impact deployment duration.¹⁸⁻²¹ The analyses in this study suggest that the current accession medical waiver process, perhaps along with predeployment attrition and predeployment screening, appropriately eliminates Soldiers at increased risk of being unable to complete a full deployment.

Strengths of this study include the comprehensive data capture of deployment, demographic, service-related, and medical accession information for all Army-deployed personnel within the study period. Data limitations prevented the determination of whether a soldier deployed and returned from deployment with his/her unit. As such, this study does not distinguish between those who had short deployments but returned with their unit and those who had short deployments, returning before their units. The inability to measure this aspect of deployment would have the greatest impact on individuals belonging to certain units that generally deploy for shorter periods of time because of their mission.¹⁶ This study is also limited to comparisons of deployed medically qualified individuals with deployed waived individuals in the U.S. Army.

It is possible that waiver status could be associated with other deployment and postdeployment outcomes. During deployment, medical encounters for nonbattle-related injuries and illnesses are the primary causes of medical diagnoses and health care,²⁷ but the potential associations between waivers and these conditions, and of postdeployment conditions, have not been investigated. Further research is needed to identify correlates between pre-enlistment medical conditions, accession medical waivers, and in-theater diagnoses, or subsequent medical evacuation. In addition, because pre-deployment diagnoses are strong predictors of postdeployment medical diagnoses, analysis of the chain of events from accession medical waivers to postdeployment health care needs is warranted. Nonetheless, this study suggests that the current accession medical waiver process, in conjunction with success in basic training and pre-deployment medical screening, appropriately identifies Soldiers capable of completing a first deployment.

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