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This research has been conducted in compliance with all applicable federal regulations governing the protection of human subjects in research.

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ABSTRACT The objective of this study was to analyze trends in preservice characteristics among Marine Corps recruits during the recent operations in Iraq and Afghanistan. Recruits completed a confidential survey during their first week of training at the Marine Corps Recruit Depot in San Diego, California. Demographics, behaviors, and health information were analyzed for trends from 2001 to 2010 using the Cochran–Armitage trend test and F statistic. Data from 131,961 male recruits with a mean age of 19.8 years were analyzed. Overall, entry characteristics remained stable exhibiting only modest changes over the study period. Favorable trends included recent (2009–2010) improvements in body mass index and physical activity levels. Unfavorable trends included increases in smokeless tobacco and caffeine use, and angry outbursts. Although many recruit characteristics remained similar over the past decade, both favorable and unfavorable trends in sociobehavioral characteristics were noted. The ongoing assessment of preservice characteristics is important for detecting emerging trends over time. Findings may guide leadership's understanding of changes to help develop early-service trainings promoting a healthier force and potentially reducing future adverse outcomes.

INTRODUCTION

New accessions in the U.S. Marine Corps undergo an arduous period of recruit training followed by a variety of unique service-related experiences, which may include combat deployments. Nearly 12% of recruits do not complete recruit training to become Marines,[1] and approximately one-third experience early attrition before completing their 4-year active duty commitment.[2] The successful completion of training and service time is critical to the Department of Defense and its mission, and unexpected attrition leads to reduction in force readiness and increased costs.[3,4] The quality of new Marine recruits is of utmost importance; however, some have suggested this may have changed over time,[5–8] especially in the setting of the recent conflicts in which new enlistees can expect to experience a combat deployment within 1 to 2 years of enlistment.[9] Historically, a relaxing of recruiting standards has occurred during times of war when a larger number of troops were needed. During the recent conflicts, waivers excusing prior misconduct and health issues, and lower test scores were not uncommon as the military sought to hit enrollment targets.[10]

Underlying health and behavioral characteristics of new recruits is important, as such baseline characteristics may predict future health and military-related outcomes (e.g., development of postdeployment post-traumatic stress disorder, early attrition, and suicide). Prior studies have found specific preservice factors, such as adverse childhood experiences, smoking, lower educational attainment, and prior family problems, to be associated with increased odds of postdeployment psychiatric disorders among Marines.[11–14] Trends of pre-existing health outcomes and behaviors among accessioning Marine recruits, however, have not been extensively studied.[4,15] Identifying baseline trends among Marine Corps recruits may help leadership modify or develop the necessary early-service interventions and prevention programs to ensure a healthier force and potentially reduce future adverse health and military-related outcomes.

METHODS

Study Population

Marine Corps recruit training takes place at 2 locations: San Diego, California and Parris Island, South Carolina. At the male-only Marine Corps Recruit Depot (MCRD) in San Diego, a voluntary questionnaire called the Recruit Assessment Program (RAP) survey is administered to every consenting recruit during the first week of training. Responses are confidential and do not affect recruit training status. Data collection for the RAP began in July 2001, just before the start of operations in Iraq and Afghanistan. This study included all recruits who completed the survey from July 2001 to October 2010. Data sources also included Defense Manpower Data Center personnel files for military-related records, such as Armed Forces Qualification Test (AFQT) scores.

Demographic and Military Characteristics

Baseline demographic characteristics examined included age at the beginning of recruit training, race, ethnicity, education, and marital status. The score of the AFQT, a multiple choice

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test measuring verbal ability, mathematical knowledge, and arithmetic reasoning used to determine qualification for enlistment in the U.S. Armed Forces, was examined. The AFQT scores are reported as percentiles and standardized to have a mean of 50 and a standard deviation (SD) of 10. Scores on the AFQT reflect an applicant's standing relative to the national population of men and women aged 18 to 23 years. Currently a score of 32 is the minimum AFQT score requirement for entry into the Marine Corps. Reasons for joining the military were also examined, with response options including for education or skills, to serve my country, for travel and adventure, to earn money, to leave problems back home, having family in the military, for a 20-year career in the military, and for other reasons.

Weight and Physical Activity

On the basis of self-report of weight and height, body mass index (BMI) in kg/m^2 was calculated. Frequency of physical activity before service entry was assessed from self-report. Initial run speed was recorded during a timed 1.5-mile run during the first week at the MCRD.

Health Behaviors

Cigarette smoking, smokeless tobacco use, alcohol use, and substances used to enhance physical performance were examined among Marine recruits. Those who reported smoking more than 100 cigarettes (5 packs) in their lifetime and also reported smoking "some days" or "every day" in the year before entering the military were classified as current cigarette smokers. Smokeless tobacco users were defined as those reporting use 3 or more times during the past year. Alcohol-related problems were defined by endorsing 2 or more items on the validated alcohol questionnaire embedded in the survey, which asks the respondent if they have ever felt the need to cut down on their drinking, annoyed by others who criticized their drinking, felt guilty about their drinking, or needed an eye-opener or early morning drink (CAGE).[16,17] Binge drinking was defined as those who reported typically drinking 5 or more drinks on 1 occasion.[18] Performance enhancer use was defined as reporting ever using caffeine or Ephedra/Ma Huang to improve physical performance.

Adverse Past Events

The number of adverse childhood experiences was based on 9 questions derived from the Adverse Childhood Experiences (ACE) Study,[19,20] which adapted questions from the Childhood Trauma Questionnaire,[21] Conflict Tactics Scale,[22] and sexual abuse questions from Wyatt.[23] Respondents were asked about incidents of physical and emotional neglect or abuse, domestic violence, child sex abuse, living with someone who was depressed or mentally ill, living with someone with alcohol-related problems, and whether or not their parents had divorced. Each question was dichotomized with "yes" counting for 1 point, and "no" for 0 points. Questions with response options on a scale (e.g., never, rarely, sometimes, often, very often) were dichotomized depending on the nature of the question and based on criteria used by Dube et al.[12,20]

The frequency of angry outbursts was determined using the question, "Do you sometimes get mad enough to hit, kick, or throw things?" with response options of "never," "about once a year," "about once a month," "about once a week," and "more than once a week." Individuals responding once a week or more were classified as frequent, whereas all others were classified as less frequent.

Statistical Analyses

Descriptive statistics were used to compare demographic, behavioral, and health-related characteristics among Marine recruits over time. Trends were analyzed for all characteristics; of note, some data were not available until 2002 or 2003 when the survey instrument was updated to include additional questions. The Cochran–Armitage trend test[24,25] was used to predict significant linear trends in the data for each binomial characteristic at the $\alpha = 0.05$ level of significance. For continuous measures, the F statistic was calculated for the linear and quadratic terms of the variable, and assessed at the $\alpha = 0.05$ level of significance. All trend graphs were adjusted for age because of the fluctuations in recruit age dependent on the time of year (e.g., surge of younger recruits over the summer after high school graduation vs. older recruits off-season). Data management and statistical analyses were performed using SAS software (Version 9.3, SAS Institute, Cary, North Carolina).

RESULTS

A total of 131,961 Marine recruit accessions completed the survey. The mean age of the study population was 19.8 years (SD = 1.98), with 68% White non-Hispanic, 21% Hispanic, 4% Black non-Hispanic, and 7% other. Nearly the entire population (97%) had received a high school diploma or higher, and the average AFQT score (range 0–99) was 62.0 (SD = 18.8). The majority of recruits were single (94%). The most common reason for joining the military was "to serve my country," followed by "other reasons," and "for education and new job skills." The mean BMI of recruits was 24.1 (SD = 3.4) kg/m^2; 36% were overweight (BMI 25.0–29.9 kg/m^2) and 3% were obese (BMI $\geq$ 30.0 kg/m^2). The mean initial run speed was 8.2 (SD = 0.8) mph, and 67% reported exercising $\geq$3 times per week. Of the recruits, 27% were current cigarette smokers, 14% used smokeless tobacco, 4% had alcohol-related problems, and 13% were binge drinkers. Caffeine use was reported by 8%, although Ephedra/Ma Huang use was reported by approximately 1% of the population. On average, recruits reported 1 (mean = 1.2; SD = 1.4) childhood trauma, with 61% reporting at least 1 event. The most common adverse childhood event reported

TABLE I. Characteristics of New Marine Corps Recruits Included in This Study (N = 131,961[a])

Descriptive Characteristics	*n*	%
Survey Year		
2001–2004	54,125	41.0
2005–2007	50,057	37.9
2008–2010	27,779	21.1
Demographic and Military-Related		
Age in Years (Mean, SD)	19.8	1.98
Race/Ethnicity		
White Non-Hispanic	85,962	68.4
Black Non-Hispanic	5,022	4.0
Hispanic	26,568	21.1
Other	8,114	6.5
Highest Education Achieved		
No High School Diploma	3,956	3.0
High School Diploma or Higher	126,810	97.0
AFQT Score (Mean, SD)	62.0	18.8
Marital Status		
Single	111,241	94.2
Married	4,040	3.4
Other[b]	2,800	2.4
Reason(s) for Joining the Military[c]		
To Serve My Country	58,922	44.9
Other Reasons	40,382	30.7
For Education and New Job Skills	13,608	10.4
For Travel or Adventure	5,334	4.1
For a Job to Earn Money	5,039	3.8
20-Year Career in Military	4,554	3.5
Family Member was in the Military	2,230	1.7
To Leave Problems at Home	1,295	1.0
Weight and Physical Activity		
BMI[d] in kg/m^2 (Mean, SD)	24.1	3.4
BMI Category[e]		
Underweight (<18.5)	3,360	3.3
Normal (18.5–24.9)	58,566	57.5
Overweight (25.0–29.9)	36,755	36.1
Obese (≥30.0)	3,147	3.1
Frequency of Physical Activity[f]		
Never	5,717	5.0
Once Per Week or Less	13,838	12.1
Twice Per Week	18,347	16.0
Three Times Per Week	26,620	23.2
Four or More Times Per Week	50,280	43.8
Initial Run Speed in mph[g] (Mean, SD)	8.2	0.8
Health Behaviors		
Cigarette Smoking Habits[h]		
Not a Current Smoker	94,185	72.9
Current Smoker	34,945	27.1
Smokeless Tobacco Use[i]		
Never Used Dip/Chew/Snuff	90,972	86.4
Used Dip/Chew/Snuff	14,355	13.6
Alcohol-Related Problems (Defined by CAGE[j])		
No	121,892	95.7
Yes	5,444	4.3
Number of Alcoholic Drinks Consumed on a Typical Day When Drinking		
None	51,700	42.0
1 or 2	90,443	31.5
3 or 4	16,315	13.3
5 or 6	8,207	6.7
7–9	4,819	3.9
10 or More	3,303	2.7
Ever Used the Following to Improve Physical Performance		
Caffeine (Yes)	8,071	8.0
Steroids, Androgens, or Testosterone Boosters (Yes)	782	0.6
Ephedra/Ma Huang (Yes)	1,097	1.1
Adverse Past Events		
Number of ACE[k] (Mean, SD)	1.2	1.4
Type of Adverse Childhood Experience		
Parents Got Divorced	40,823	43.3
Physical Neglect	17,712	17.3
Emotional Neglect	16,195	15.9
Emotional Abuse	13,692	13.4
Lived With Someone Who was a Problem Drinker or Alcoholic	11,215	11.0
Domestic Violence	8,375	8.2
Lived With Someone Who was Mentally Ill	7,316	7.2
Physical Abuse	3,259	3.2
Child Sexual Abuse	1,718	1.7
Frequency of Angry Outbursts[l]		
Never	68,274	55.3
About Once a Year	31,970	25.9
About Once a Month	15,735	12.8
About Once a Week	5,246	4.3
More Than Once a Week	2,184	1.8

ACE, adverse childhood experiences; AFQT, Armed Forces Qualification Test; BMI, body mass index; mph, miles per hour; SD, standard deviation. [a]Numbers (n) may not add up to 131,961 because of missing self-reported data for individual items. [b]Other response options included living together, separated, divorced, or widowed. [c]Participants were instructed to mark all that apply; therefore, all categories are not mutually exclusive. [d]Calculated based on self-reported height and weight. [e]As defined by the Centers for Disease Control and Prevention standards. [f]Physical activity was defined as participation in a physical sport or activity (e.g., basketball, biking, or fast dancing) that made the participant sweat and breathe hard for at least 20 minutes. [g]Calculated based on the Initial Speed Test. [h]Current cigarette smokers were defined as those who endorsed smoking 100 cigarettes (5 packs) or more in their lifetime, and also reported smoking "some days" or "every day" in the year before entering the military. [i]Smokeless tobacco users were defined as those who reported using smokeless tobacco 3 or more times in the past year. [j]Respondents were classified as having alcohol-related problems if they positively endorsed 2 or more items on the CAGE questionnaire embedded in the RAP survey. [k]Questions asked about incidents of physical and emotional neglect, physical and emotional abuse, domestic violence, child sexual abuse, living with someone who was mentally ill, living with someone with alcohol-related problems, and whether or not the respondent's parents had ever divorced. [l]Defined by the question, "Do you sometimes get mad enough to hit, kick, or throw things?"

was divorce of their parents (43%), followed by physical neglect (17%), emotional neglect (16%), and emotional abuse (13%). Angry outbursts occurred frequently among 6% (Table I).

All trends were statistically significant at the $p < 0.05$ level. The mean age at entry to recruit training slightly increased over time with a peak at 20.0 years in 2008. The majority (96–97%) of recruits had a high school diploma or higher during 2001 to 2008, with an increase to over 99%

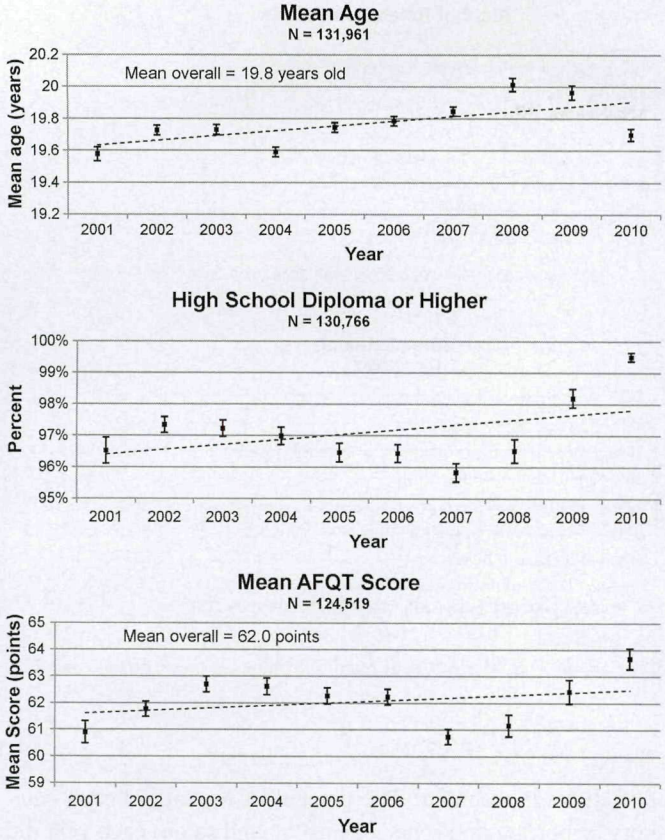


FIGURE 1. Trends in age, education, and AFQT scores among U.S. Marine Corps recruits. Point estimates (squares) and 95% confidence intervals (error bars) by year. Linear trend lines pictured, AFQT, Armed Forces Qualification Test.

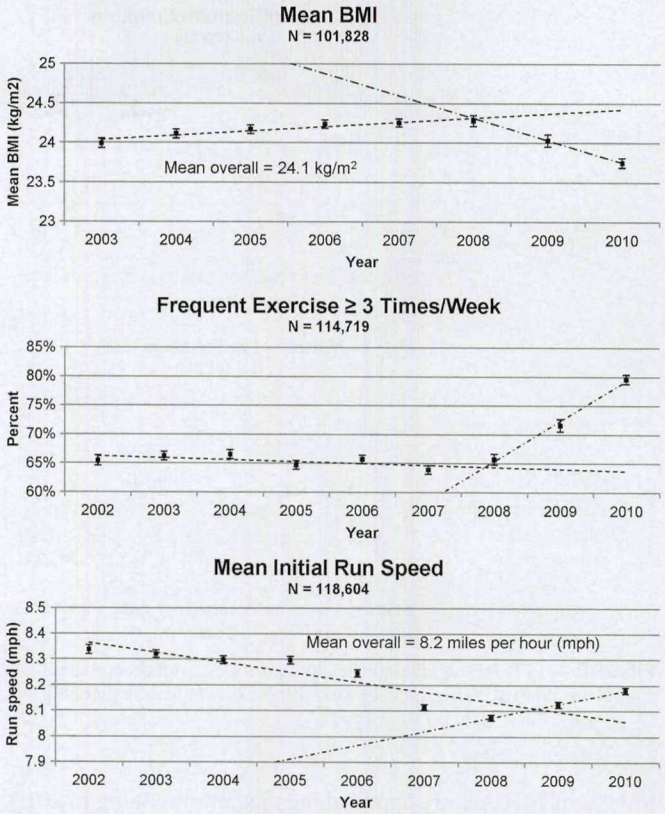


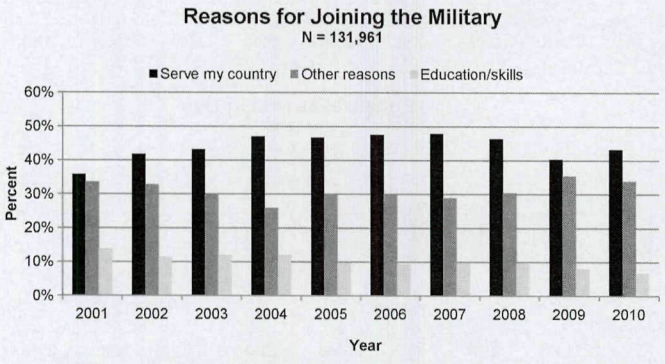
FIGURE 2. Trends in BMI, physical activity level, and initial run speed among U.S. Marine Corps recruits. Point estimates (squares) and 95% confidence intervals (error bars) by year. Linear trend lines pictured, BMI, body mass index.

in 2010. The AFQT scores increased slightly in the first few years, stabilized, decreased in 2007 and gradually recovered, and peaked in 2010; but the average score per year never changed more than 3 points (Figure 1).

The mean BMI of recruits gradually increased from 2003 to 2008, and then decreased in 2009 to 2010. Examining BMI categorically showed that those in the overweight or obese category increased until 2008, and then decreased in 2009 to 2010 to 35% overweight and <1% obese (data not shown). The frequency of exercise simultaneously increased in 2009 to 2010. Initial run speed showed an overall negative slope with the slowest mean running speed occurring in 2008, but showed improvement during the last 2 years of the study (Figure 2).

From 2001 to 2010, the most commonly endorsed reason for joining the military remained "to serve my country." The percent who selected this response increased significantly from 36% in 2001 to 48% in 2007, then declined from 2008 to 2010, but maintained a positive slope over time. Other highly endorsed options were "for education and new jobs skills" and "other reasons," although the least endorsed option consistently remained "to leave problems at home." Other response options included "for travel or adventure," "for a job to earn money," "family member was in the military," and for a "20-year career in (the) military" (Figure 3).

Trends in behavioral characteristics are shown in Figures 4 and 5. Cigarette smoking decreased in early years, began to increase from 2005 to 2009, and then dipped down to 22% in 2010. Smokeless tobacco use increased from 11% in 2002



Other response options endorsed: for travel or adventure, for a job to earn money, to leave problems at home, family member(s) in the military, for a 20-year career in the military.

FIGURE 3. Top three reasons for joining the military among U.S. Marine Corps recruits.

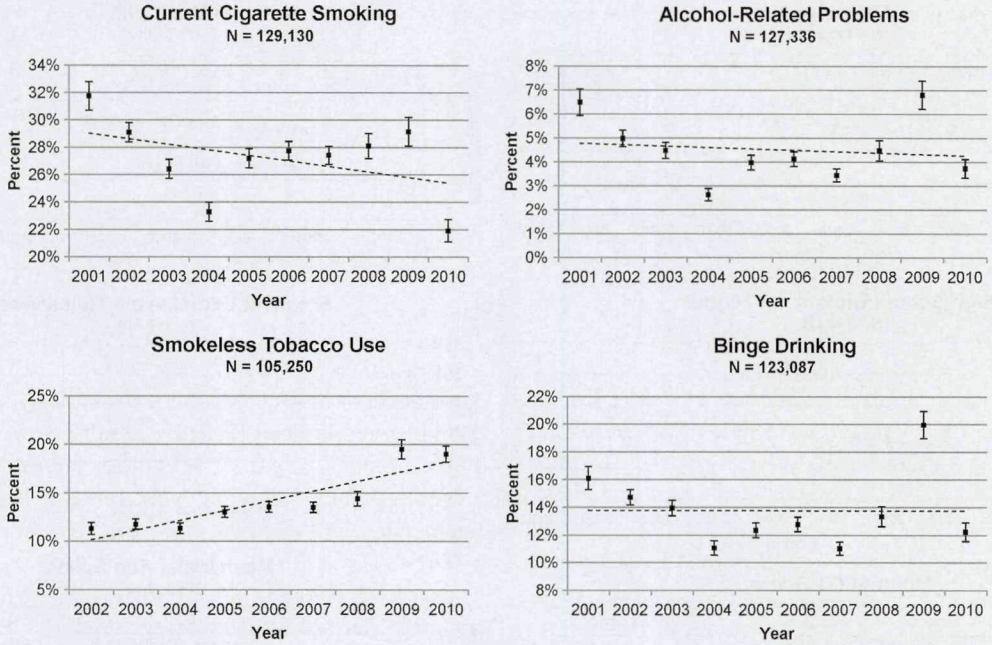


FIGURE 4. Trends in cigarette smoking, smokeless tobacco use, and alcohol use among U.S. Marine Corps recruits. Point estimates (squares) and 95% confidence intervals (error bars) by year. Linear trend lines are pictured.

to 19% in 2010, nearly approaching cigarette smoking in 2010. Alcohol-related problems and binge drinking fluctuated very little. An upward trend in caffeine use was seen from 2003 (6%) to 2010 (14%), although Ephedra/Ma Huang use diminished from 2003 (3%) to 2010 (<1%) (Figure 5).

History of adverse childhood events was also examined among recruits. The mean number of ACE remained stable over time at around 1. The percent of recruits in each category (reporting no events, one event, and so on) each year did not fluctuate by more than 3% over the time period. When divorce was excluded, the mean number of ACE remained less than 1 throughout 2003 to 2010 (data not shown). Marine recruits with frequent angry outbursts slightly decreased from 2001 to 2007, and then increased from 2008 to 2010 peaking at 11% in 2009 (Figure 6).

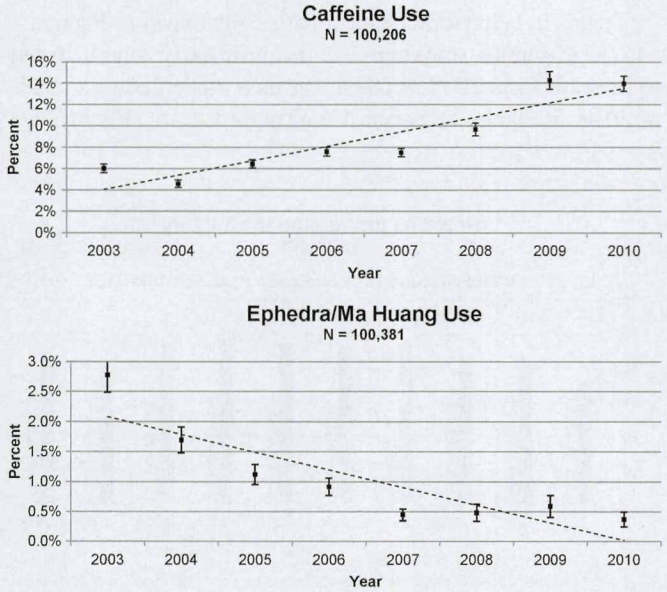


FIGURE 5. Trends in caffeine use and Ephedra/Ma Huang use among U.S. Marine Corps recruits. Point estimates (squares) and 95% confidence intervals (error bars) by year. Linear trend lines are pictured.

DISCUSSION

This study provides novel data on preservice demographic, behavioral, and health trends of over 130,000 young men joining the U.S. Marine Corps. Our data showed mostly modest changes in entry characteristics of Marine recruits over the last decade. Worsening trends from 2001 to 2007 and then gradual improvement from 2008 to 2010 were found for some characteristics, although a few other characteristics indicated worsening or improving trends over the entire period of assessment. Some unfavorable trends that were observed in the earlier years subsequently reversed in 2008 to 2010; such trends included an increase in BMI with a concurrent decrease in run speed and exercise frequency. The most concerning trends were an increase in the number of angry outbursts and increases in smokeless tobacco use and caffeine use over the decade. Favorable trends over the study period included a recent increase in physical fitness. Identifying changes in preservice characteristics and subgroups that are at potentially higher risk for early attrition or other adverse health events is critical in guiding early service trainings and educational programs.

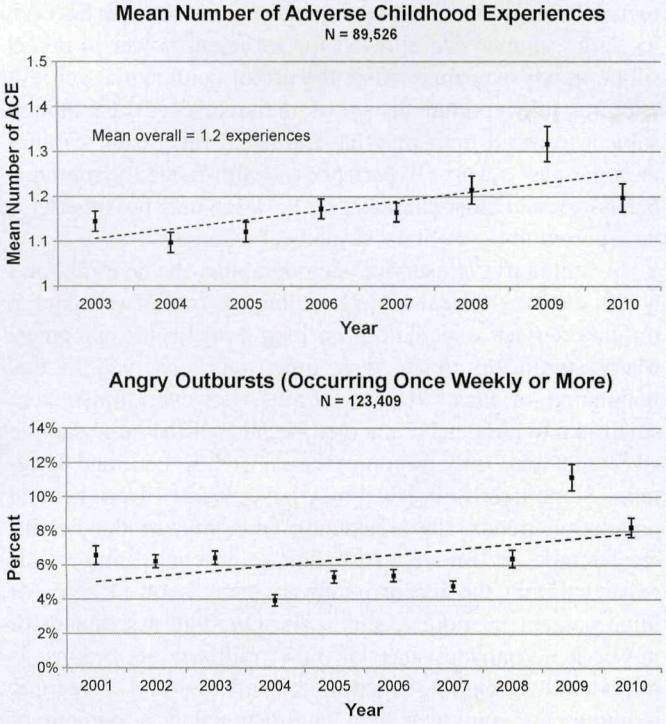


FIGURE 6. Trends in ACE and frequency of angry outbursts among U.S. Marine Corps recruits. Point estimates (squares) and 95% confidence intervals (error bars) by year. Linear trend lines pictured, ACE, adverse childhood experiences.

Although we detected a trend of increasing age from 2001 to 2010, the mean age only fluctuated from 19.6 to 20.0 years with the highest in 2008. This slight increase in age among the MCRD recruits in 2008 may have been associated with a push from Congress that same year to increase total active duty strength from 182,000 to 202,000 to support the ongoing combat operations in Iraq and Afghanistan. To achieve this increase in personnel, the Marine Corps decided to "mature" the force by increasing re-enlistments and opening more opportunities for prior service recruiting. As such, a Delayed Entry Program (DEP) was instituted as the recruit training pipeline backed up. Most recruits were in DEP for 6 months or longer before arriving at the MCRD for training; thus, likely resulting in an age shift compared to years prior when most recruits were sent directly to training within the same month that they were recruited.[8,26]

Overall, alcohol-related rates were low in our study population. This finding was most likely because of evaluating recruits before military service, most of whom were under the legal drinking age of 21. Our study is important as it shows that alcohol-related behaviors did not exist at an elevated rate in this young male population before military service. Because studies have shown that younger service members who deploy and experience combat are at increased risk of new-onset heavy weekly drinking, binge drinking, and alcohol-related problems,[27] in-service interventions targeting young Marines could be beneficial in preventing future increases in these behaviors.

Caffeine use to enhance physical performance more than doubled over the years, although Ephedra/Ma Huang use nearly ceased after the ban of these supplements.[28,29] Energy drinks, supplements, and caffeinated gum are increasingly used to improve physical performance among young persons as highlighted by the high and rising rates of use among military recruits in this study. In addition, military personnel during active duty service may use caffeine to improve focus and alertness; in fact, 45% of deployed service members reported drinking at least one energy drink daily.[30] Caffeine may also be frequently used among military members during periods of required sustained wakefulness such as long-range flying missions, guard duty, combat, and other deployment-related activities. Research on the possible benefits as well as health risks[31] of caffeine use among military personnel is important given the rising rates of its use.

Cigarette smoking fluctuated over time among newly enlisting Marines. A decreasing trend has been seen in the U.S. military as a whole,[32] the U.K. Armed Forces,[33] and in the general U.S. population.[34,35] However, smoking is still prevalent in the military[36–39,40] and has been linked to poor training performance and early discharge.[41,42] Thus, smoking cessation and prevention programs are essential to continue this trend and to prevent future initiation and recidivism. Interestingly, an increasing trend in smokeless tobacco use was observed in this population. This observation contradicts data in the general population[43,44] and reiterates the ongoing tobacco problem in the military,[38] suggesting that more men enlisting are already using smokeless tobacco products. Earlier interventions and continued surveillance of this unhealthy preservice trend are warranted. Because recruit training is tobacco-free, this may be the ideal time to strengthen strategies for sustaining abstinence.

A slight increase in ACE occurred over time with the most highly endorsed event being that their parents had divorced, which is consistent with the national divorce rate.[45] Premilitary trauma has been shown to significantly increase risk for early attrition among Marines[46] and postdeployment mental health issues, such as post-traumatic stress disorder.[12] Although this trend was of a small magnitude and was only detected because of the large sample size, it is important to continue monitoring this characteristic in new accessions over time.

An upward trend in BMI was observed concurrent with decreasing run speeds during 2001 to 2008. However, during 2009 to 2010, these trends reversed, and there was also a positive trend in exercise frequency. In the U.S. population, BMI showed a significantly increasing linear trend from 1999 to 2010 among men, but no significant difference when comparing estimates from 2009 to 2010 with 2003 to 2008, suggesting a slowing or leveling off.[47] These data suggest that an unhealthy trend existed, but then interestingly reversed when the pool of potential recruits increased in 2008 concurrent with the economic downturn and exponential

increase in the U.S. unemployment rate.[48] It is also possible that this temporal finding was a result of the DEP that was instituted around the same time, which provided many recruits extra time to get into shape before beginning training at MCRD. Maintaining fitness standards before and throughout military service, as well as educating personnel on maintaining a healthy weight, is important to ensure a fit and combat-ready force.

AFQT scores and education level fluctuated over the decade; however, changes were of small magnitude and likely not scientifically meaningful. A review of the literature has suggested that recruits without a high school diploma are twice as likely to attrite from the military in their first term of service.[2] Compared to the other service branches, the Marine Corps had the highest percentage of recruits scoring in the low AFQT category IIIB (i.e., the bottom half of test takers scoring from 31 to 50) in 2004.[8] However, this study provides reassurance that average AFQT scores have not worsened over the last decade.

The most commonly endorsed reason for joining the military was "to serve my country." It is not surprising that this endorsement increased over time as the tempo of the recent conflicts gained momentum. Recruits voluntarily choosing to join the Marine Corps during a time of war likely understood the possibility of deploying and supporting the United States. Many recruits (around 30%) reported joining the military for "other reasons"; therefore adding additional choices and/or an open-text field for this category on the RAP survey may prove beneficial for future research. Those who joined to earn an education and new job skills significantly decreased over time, suggesting that these opportunities may need to be more strongly emphasized in recruitment strategies to gain more appeal from future recruits.

This study has several limitations that must be considered. First, all data taken from the RAP surveys were self-reported, which may have resulted in some biased results (e.g., recall bias, volunteer bias) and the under-reporting of some negative behaviors. Second, this study did not include female Marines or Marines who entered initial training at Parris Island; that said, we believe the RAP participants to be well-representative of male Marine recruits. BMI findings should be interpreted with caution and considered in the context of this young Marine population because it is not a direct measure of body fat and may be affected by increased muscle mass, which is common among Marines.[49] However, the BMI trends were concordant with the trends in exercise frequency and run speed in this study. In addition, there were many factors that were not measured by the RAP survey, such as illicit drug use, prior injuries and concussions, mental health problems, and other health outcomes and behaviors. Future RAP surveys will include many of these important factors.

Despite these limitations, this study has important strengths. First, this study provided a unique opportunity to investigate various characteristics of new Marine Corps recruits over time before beginning military service. Second, the large sample size allowed for sufficient power to detect subtle trends over time. Also, the use of confidential surveys eliciting self-reported behaviors or adverse events, though subject to recall bias, may have allowed for greater capture of some past adverse experiences, health-related symptoms, behaviors, and other characteristics, which may not otherwise be reported in the military or medical records.

In summary, preservice demographic, behavioral, and health data are critical in determining the role of subsequent military service experiences on long-term health outcomes. Many significant trends over time were observed in this population of male Marine recruits; however, most were small in magnitude and emerged because of the large sample size, and may only become issues if they continue long-term. Some trends observed may have resulted from general population trends, the weakening economy, or the heightened tempo of the war. Although some concerning trends existed during the recent conflicts, many showed signs of improvement in more recent years. Ongoing assessment of preservice characteristics of new military accessions is important in guiding recruitment efforts and screening requirements, and may help facilitate the development of early service interventions and educational programs to reduce future adverse military outcomes.

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14. ABSTRACT
The objective of this study was to analyze trends in preservice characteristics among Marine Corps recruits during the recent operations in Iraq and Afghanistan. Recruits completed a confidential survey during their first week of training at the Marine Corps Recruit Depot in San Diego, California. Demographics, behaviors, and health information were analyzed for trends from 2001 to 2010 using the Cochran-Armitage trend test and F statistic. Data from 131,961 male recruits with a mean age of 19.8 years were analyzed. Overall, entry characteristics remained stable exhibiting only modest changes over the study period. Favorable trends included recent (2009-2010) improvements in body mass index and physical activity levels. Unfavorable trends included increases in smokeless tobacco and caffeine use, and angry outbursts. Although many recruit characteristics remained similar over the past decade, both favorable and unfavorable trends in socio-behavioral characteristics were noted. The ongoing assessment of preservice characteristics is important for detecting emerging trends over time. Findings may guide leadership's understanding of changes to help develop early-service trainings promoting a healthier force and potentially reducing f'uture adverse outcomes.

15. SUBJECT TERMS
Recruits, Marine Corps, trend analysis, Operation Iraqi Freedom/Operation Enduring Freedom, pre-service characteristics

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