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Epidemiology and Disease Surveillance Directorate**

**Evaluation of the Mountain Athlete Warrior (MAW) Physical Training Program in a
Light Infantry Brigade, March 2011-February 2012**

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14. ABSTRACT A variety of exercise and conditioning programs with greater focus on injury reduction and improved physical fitness are currently being implemented by brigades and battalions throughout the United States Army. The Mountain Athlete Warrior (MAW) physical fitness program was developed to mentally and physically prepare Soldiers for the rigorous demands of combat in varied environments. The MAW program was based on the fundamentals of powerlifting and on extreme conditioning. Purpose: To evaluate risk factors for injury among participants in the MAW program and all battalions in a light infantry brigade. Methods: Personal characteristics, physical training, physical fitness scores, and injury data over 6 month periods were obtained by initial and follow-up surveys from male and female Soldiers in an Army light infantry brigade. Physical fitness tests including Functional Movement Screening (FMSTM) were performed before and after implementation of MAW. Results: A total of 595 male and 31 female Soldiers completed both initial and follow-up surveys. Both average body mass index and the number of smokers increased among male Soldiers after implementation of MAW. Injury incidence did not change after implementation of MAW (23% before MAW vs 23% after MAW). Soldiers had higher average total FMS scores before implementation of MAW (16.9 points) compared to after implementation of MAW (16.5 points). Significant improvement was noted in the APFT total score for male Soldiers (an increase of 8 points after MAW implementation). Conclusion: The MAW program resulted in no change in injury incidence, but some physical performance improved.					
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Table of Contents

	<u>Page</u>
1 Summary	1
1.1 Overview	1
1.2 Purpose.....	1
1.3 Methods	1
1.4 Results	1
1.5 Conclusions & Recommendations	2
2 References	2
3 Authority	2
4 Background	2
4.1 Oversight.....	3
4.2 Overview	3
5 Methods	3
5.1 Data Collection	3
5.2 Data Analysis	6
6 Results	6
6.1 Personal Characteristics	6
6.2 Exercise Leader Training	8
6.3 Physical Training	8
6.4 Physical Fitness Performance	10
6.5 Injury Data from Surveys.....	12
6.6 Injury Risk Factors	16
7 Discussion	19
7.1 Physical Training	20
7.2 Physical Fitness Assessments	21
7.3 APFT Performance	21
7.4 Injury and Injury Rates	21
7.5 Limited Duty Days	22

	<u>Page</u>
7.6 Limitations	22
8 Conclusions and Recommendations	22
9 Points of Contact	23

Appendices

A	References	A-1
B	Supplemental Tables	B-1
C	Initial Survey Template	C-1
D	Follow-up Survey Template	D-1

Tables

1	Comparison of demographics and injury data from electronic medical records: Evaluation sample vs. all enrolled: Men and Women	7
2	Comparison of Demographics, Evaluation Sample: Men and Women	8
3	Unit Physical Training Before and After MAW Implementation, Evaluation Sample	9
4	Personal Physical Fitness Training Before and After MAW Implementation, Evaluation Sample: Men and women	10
5	Injury, Evaluation Sample: Men and Women (Type of Injury and Body Part Injured)	11
6	Limited Duty Days by Injury Activity, Evaluation Sample: Men and Women	11
7	Limited Duty Days by Injury Type, Evaluation Sample: Men and Women	12
8	Number of Limited Duty Days by Body Area, Evaluation Sample: Men	

Technical Report No. S.0032423.3-11

	and Women.....	12
9	Demographic Injury Risk Factors, Evaluation Sample: Men (Follow-Up Survey) .	13
10	Injury Risk, Evaluation Sample: Men (Univariate Unit PT)	14
11	Personal PT and Injury Risk, Evaluation Sample: Men	15
12	Descriptive Statistics for Initial FMS Assessment, Evaluation Sample: FMS Men and Women.....	15
13	FMS TM Frequency Table, Evaluation Sample: FMS Men and Women	16
14	Average Physical Fitness Test and BMI Scores, Evaluation Sample Data: Men.....	17
15	Average Physical Fitness Test and BMI Scores, Evaluation Sample Data: Women	19

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Light Infantry Brigade
March 2011 – February 2012

1 Summary

1.1 Overview

A variety of exercise and conditioning programs with greater focus on injury reduction and improved physical fitness are currently being implemented by brigades and battalions throughout the United States Army. The development of the Mountain Athlete Warrior (MAW) physical fitness program was for Soldiers to prepare, mentally and physically, for the rigorous demands of combat in varied environments.

In the fall of 2011, the MAW program was implemented into the light infantry brigade and replaced the brigades prior physical training program which primarily consisted of traditional Army physical training (PT) (running, push-ups, sit-ups, and calisthenics). The MAW program is based on the fundamentals of an extreme conditioning program (ECP) and power/Olympic weight training. Prior to implementation of the MAW program, the brigade requested assistance from the Army Public Health Center (APHC) in evaluating the effectiveness of the MAW program.

1.2 Purpose

To evaluate the effectiveness of a new physical training program (MAW) on injury risks and to identify risk factors for injury in the brigade.

1.3 Methods

In March to April 2011, the APHC Injury Prevention Program administered paper surveys to the brigade asking participants about personal characteristics, physical training, physical fitness scores, and injury data from the past 6 months. The APHC administered a similar follow-up survey 6 months later in September–October 2011. Physical fitness testing was conducted along with the initial and final survey.

An external organization trained and certified approximately 300 Soldiers designated as exercise leaders in the fundamentals of an Extreme Conditioning Program (ECP). They also attended an onsite powerlifting course taught by an expert in the field. Then, the exercise leaders implemented powerlifting and an ECP into their daily exercise programs.

1.4 Results

1.4.1 General

A total of 595 male and 31 female Soldiers completed both initial (31 percent of total responses) and follow-up surveys (32 percent of total responses). Both average body mass index (BMI) and the number of smokers increased after implementation of MAW for male Soldiers. There was

no change in injury incidence after implementation of the MAW program. Male Soldiers had higher average total Functional Movement Screening (FMS™) scores before MAW implementation (16.9 points) than after MAW implementation (16.5 points). Significant improvement was noted in the Army physical fitness test (APFT) total score for male Soldiers (an average increase of 8 points after MAW implementation).

1.4.2 Injury Rates

Six months before and 6 months after implementation of MAW, injury rates remained similar at 23 percent ($p = 0.94$).

1.4.3 Types and Causes

The top three injury types prior to MAW implementation for men and women were sprain or strain (55%), pain (16%), and broken/fractured bone (6%). After MAW implementation, the top three injury types were sprain or strain (51%), pain (15%), and dislocation (8%). Running was the leading cause of injury before (40%) and after MAW (34%). Walking/hiking/road marches were the second leading cause of injury before (24%) but moved to third leading cause after MAW (13%). Lifting or moving heavy objects moved to the second leading cause of injury after MAW (16%; was 7% prior to MAW).

1.4.4 Profiles, Limited duty days (LDD)

Prior to MAW implementation, injuries resulted in an estimated 544 LDDs per month. After MAW implementation, injuries resulted in an estimated 308 LDDs per month. However, the period after implementation included holiday and training leave when fewer injuries and LDDs may have occurred or been captured.

1.5 Conclusions and Recommendations

Injury incidence remained similar after implementation of MAW. Even though there was a decrease in LDDs, this maybe be misleading due to additional leave for holidays and training over the evaluation period. Although there was an improvement in fitness performance, overall fitness levels prior to MAW were lower than normally seen in similar infantry units. Further analysis is needed with other Army units utilizing this program and for longer durations to assess impact on injuries and observe long-term effects.

2 References

See Appendix A for a listing of references used within this report.

3 Authority

Under U.S. Army Regulation (AR) 40-5, Section 2–19, the U.S. Army Center for Health Promotion and Preventive Medicine (currently renamed the Army Public Health Center). APHC is responsible for providing epidemiologic consultation and program evaluation services in the area of injury prevention and control to Army commands and direct reporting units upon request (Department of the Army (DA), 2007).

4 Background

The APHC Injury Prevention Program's mission is to identify injury causes or risk factors that can be used in evidence-based initiatives to prevent injuries. The purpose of this evaluation was to evaluate the effectiveness of a new physical training program (MAW) on injury risks and to identify risk factors for injury in the brigade.

4.1 Oversight

The APHC had oversight of this evaluation.

4.2 Overview

In March 2011, a light Infantry brigade located in the southwestern United States at an elevation greater than 5,000 feet requested assistance from the APHC Injury Prevention Program to evaluate their new physical training program, the MAW Program. In April 2011, the APHC Public Health Review Board approved the evaluation project as a "public health practice." The MAW program consisted of training Soldiers (E4 to E5 rank) that would later instruct and lead their unit during physical training sessions. The initial instructor-training phase consisted of a 3-week ECP training course taught from July 2011 through the end of September 2011. This course taught the foundation of the program and the role of instructors, goals of the program, daily workout design, and how to motivate those they trained (MAW training manual). Soldiers were also taught specific exercises, the muscle groups associated with each exercise, and appropriate frequency of exercises/training with pre- and post-assessments to evaluate course comprehension (see Appendix C). A second component of the course included strength and power lifting training by an experienced power lifter and strength coach for one additional week. The goals of the MAW program were to maximize physical fitness, both individually and collectively, in preparation for rigorous combat operations, to introduce training activities that are versatile enough to be implemented in varied environments, and to prevent injuries.

After being certified and attending the strength course, the trained Soldiers led/taught the new program and exercises to other Soldiers during unit PT.

Daily workouts for participants in the MAW program consisted of building either strength or cardiovascular endurance. The goals included training using functional movements, avoiding routine, increasing the capacity to do work, gaining experience and broadening physical and mental limits, and achieving balance across all physical aspects of aerobic and anaerobic fitness. A daily workout consisted of 5 minutes of easy aerobic exercises, dynamic stretch routine, skill session for complex movements, and full anaerobic or aerobic workouts. The MAW program combines principles from powerlifting and an Extreme conditioning program in an effort to improve overall functional fitness, health, and well-being. MAW emphasized more cross-training and other activities in place of long distance running.

5 Methods

5.1 Data Collection

Data obtained from this brigade included a roster of Soldiers currently assigned to their unit prior to the administration of the initial and follow-up surveys. A roster list of the selected Soldiers' names attending MAW training was also provided prior to the administration of the follow-up surveys.

Demographic data, unit and personal PT activities, physical fitness, and injury data were obtained from surveys administered to the Soldiers before and after implementation of the MAW program (see Appendix C for initial survey template). Physical fitness data included self-reported height, weight, and most recent APFT scores. The APFT test scores included results from three events: maximum number of push-up repetitions completed in 2 minutes, maximum number of sit-up repetitions completed in 2 minutes and 2-mile run times. In March/April 2011, APHC administered initial surveys capturing the above information for the period 6 months prior to MAW implementation (October/November 2010–March/April 2011). Full implementation was delayed slightly due to scheduling conflicts, but follow-up surveys were administered 6 months after implementation of MAW in January/February 2012. The follow-up survey asked similar questions to the first (see Appendix D for follow-up survey).

In conjunction with the surveys, Soldiers completed a battery of physical fitness tests before and after implementation of MAW. These tests were completed within the same day and were overseen by the brigade physical therapist and administered by her staff or Soldiers trained by her staff.

5.1.1 Functional Movement Screen

Functional Movement Screening (FMS) involved seven tests: deep squat, hurdle step, in-line lunge, shoulder mobility, active straight leg raise, trunk stability pushup, and rotary stability. Each test had a range of zero to three points with a maximum possible score of 21 points if the individual demonstrated sound biomechanics throughout each movement and did not experience pain. The scoring analysis included the following:

- If pain was present, the individual automatically scored zero points for that particular test;
- One point was given if the individual could not complete the proper movement and was pain-free;
- Two points were given if the movement was performed with some difficulty and was pain-free; and
- Three points were given if the movement was performed as instructed with no difficulty or compensation and was pain-free (O'Connor et al. 2011).

The following three screening tests were performed to test for the presence of pain but were not scored numerically: shoulder screen, lumbar extension, and lumbar flexion. If Soldiers experienced pain during any of these screenings, the scores from shoulder mobility, trunk stability push-up, and rotary stability would change to zero, respectively. A more detailed description of all seven FMS tests can be found in the two-part clinical commentary by Cook et al. (2006).

5.1.2 Pull-ups

The pull-ups test was a measure of muscular strength and endurance that involved Soldiers performing as many pull-ups as they could until failure. Soldiers were instructed to begin the movement from a basic hang with their arms straight and palms facing away from the body (overhand grip). Upon movement initiation, Soldiers bent their arms and pulled themselves upward until their chin was over the top horizontal bar, and then returned to a straight-arm hang before beginning the next repetition. Movement of the legs, particularly in a kicking motion, was prohibited. The total number of pull-ups until failure, without regard to time, was recorded.

5.1.3 Y-Balance Test (YBT)

The YBT assessed movement asymmetry in three different directions: anterior, posteromedial, and posterolateral. Soldiers performed six attempts per direction. Upon completion of three quality attempts with one leg, they switched legs and performed three more. Soldiers stood on the middle platform with one leg and pushed the reach indicator as far as they could in each direction with their toes. After sliding the reach indicator, they were required to return back to the middle platform while maintaining balance and control. If they lost control and touched down on the floor before returning to the start, the attempt was nullified. Also, the attempt was negated if they kicked the reach indicator instead of pushing it (Plisky et al. 2009).

Movement asymmetry was determined by subtracting left and right scores for the three directions. Greater left/right differences may put an individual at increased risk for injury due to functional deficits in movement (Plisky et al. 2006). A composite score was calculated for the left and right side movements by taking the sum of the best anterior, posteromedial, and posterolateral scores divided by three times the limb length.

5.1.4 300-Yard Shuttle Run

The 300-yard shuttle run was a test of anaerobic endurance and agility. This test consisted of a weighted and unweighted trial. For the weighted trial, Soldiers wore a weighted vests representative of their self-determined body size of small (20 pounds), medium (25 pounds), or large (30 pounds). For this test, an individual started behind one cone and sprinted to a second cone 25 yards away, touched the line denoted by the second cone, and sprinted back to the start. This was repeated six times to cover the distance of 300 yards.

5.1.5 Crossover Hops

The crossover hops test was a measure of muscular power and balance. The Soldiers performed three consecutive jumps with the same leg, with each successive jump crossing over a line. The total distance from the three consecutive jumps was the total score, with higher total scores indicating better performance.

5.1.6 Vertical Jump

The vertical jump is a measure of muscular power. First, Soldiers were measured for standing reach height: standing flush against a wall and reaching up as high as possible to record the natural distance reached upward while standing flat-footed. Soldiers were then positioned directly beneath the Vertec and given three attempts to jump as high as possible to displace the vanes on the Vertec. Movement was initiated while performing a half-squat (legs at approximately 90 degrees), swinging the arms backwards and forwards while re-extending the body and jumping as high as possible. Soldiers were required to jump from a stationary position and were not allowed to take any steps to generate momentum prior to the jump. The standing reach height was subtracted from the greatest jump height to record the best attempt.

5.1.7 Medical Records

Medical records containing personal characteristics and injury visit data (inpatient and outpatient International Classification Disease 9th Revision (ICD-9) diagnosis codes) from May 2013 to June 2014 were acquired from the Defense Medical Surveillance System, maintained by the Armed Forces Health Surveillance Branch. During this time period there was a cumulative total of 5,980 Soldiers within the brigade due to new Soldiers arriving and others leaving. Injury data for individuals was linked with roster information. Injuries were categorized into three injury index

groups using the primary (first) ICD-9 diagnosis code: overall injury (CII), overuse injuries (OII), and traumatic/acute injuries (TII). These injury indices were developed by personnel in the Injury Prevention Program at the APHC. The CII captures all ICD-9 codes related to both overuse and traumatic injuries. The OII captures the subset of musculoskeletal injuries presumably resulting from cumulative micro trauma (overuse-type injuries) and the TII captures a subset of musculoskeletal injuries resulting from a strong sudden force or forces being applied to the body.

5.2 Data Analysis

The Statistical Package for the Social Sciences (SPSS®), Version 19.0, was used for statistical analysis. Descriptive statistics were calculated for Soldiers who completed both surveys. Descriptive statistics (frequencies, distributions, means, standard deviations) were calculated for personal characteristics, PT participation, and physical fitness. BMI was calculated as weight in kilograms divided by height in meters squared (kg/m^2). BMI was categorized according to the Centers for Disease Control and Prevention classifications for “normal,” “overweight,” and “obese.” Current cigarette smokers were identified as smoking at least one cigarette within the last 30 days and smoking 100 or more cigarettes in their lifetime. APFT test results were converted into tertiles (T) where T3 = lowest 1/3rd (33%) of performance and T1 = highest 1/3rd (33%) of performance.

To assess program effects, Soldiers who had been with the unit prior to and during MAW implementation and completed both surveys were identified as the evaluation sample. To assess changes in unit and personal PT activities after implementation of the MAW Program, marginal homogeneity test and Wilcoxon Signed Rank tests were used to determine p-values. Limited duty days per month were also calculated before and after implementation of the MAW program along with the percentage change over this time.

Electronic medical records data on overall injuries occurring after implementation of the new exercise program were used to assess the effects of the MAW program on injury risk. Chi-square test results available in OpenEpi (OpenEpi 2015) were used to create unadjusted univariate analysis using risk ratios and 95% confidence intervals (95% CI). In addition, a secondary objective was to assess the other risk factors for injury in this brigade. A multivariate analysis was performed, but no significant findings resulted probably due to very few variables showing significance within the univariate tables.

Additional assessment of the sensitivity and specificity of the FMS test in this brigade are presented in Appendix B. Receiver-operator characteristic (ROC) curve tests were also conducted for each physical fitness assessment to compute sensitivity, specificity, and area under the curve (Appendix B).

6 Results

6.1 Personal Characteristics

According to unit rosters obtained in March 2011 and January 2012, there were 4,422 and 4,200 Soldiers, respectively, assigned to the brigade during initial and follow-up evaluations. Approximately 45% (1,990) and 44% (1,862) of the brigade completed the initial and follow-up survey, respectively. There were 626 Soldiers who completed both the initial and follow-up survey. The analysis is based on these 626 Soldiers, hereafter referred to as the “evaluation sample.” Table 1 displays and compares demographic data for men and women. Results showed a majority

of Soldiers were men (95%), 25 years of age or less (62%), and had rank of E4–E6 (67%). Nearly half (46%) of the sample was from an infantry battalion.

Table 1 compares demographics of the evaluation sample (Soldiers completing both pre- and post-MAW surveys) to the entire brigade using Defense Medical Surveillance System data (All Soldiers who were within the brigade during March 2011 to January 2012, n=5,980). Results show the evaluation sample, compared to the entire brigade, had fewer women, more 23–25 year olds, more Caucasians, a greater percentage of single Soldiers, more high school graduates and fewer injuries.

Table 1. Comparison of Personal Characteristics and Injury Data from Electronic Medical Records, Evaluation Sample vs. All Enrolled

Variable	Categories	Evaluation sample (n=626) n (%)	Entire brigade (n=5980) n (%)	Chi-square p-value (sample vs. all)
Gender	Male	595 (95)	5368 (90)	<0.01
	Female	31 (5)	612 (10)	
Age	17-22	207 (33)	679 (37)	<0.01
	23-25	181 (29)	430 (23)	
	26-29	138 (22)	388 (21)	
	≥30	100 (16)	352 (19)	
Race	White	456 (73)	3773 (69)	0.02
	Hispanic	82 (13)	668 (12)	
	Black	58 (9)	679 (12)	
	Other	30 (5)	358 (7)	
Marital status	Single	326 (52)	2141 (41)	<0.01
	Married	284 (45)	2795 (54)	
	Other	16 (3)	247 (5)	
Education level	High school or equiv.	555 (89)	4068 (79)	<0.01
	Some College	28 (5)	400 (8)	
	Bachelor's	22 (4)	459 (9)	
	Master's or above	2 (<1)	89 (2)	
	Unknown/Other	19 (3)	168 (3)	
Component	Active Duty	625 (100)	5120 (99)	0.06
	National Guard	1 (<1)	36 (<1)	
	Reserve	0 (0)	27 (<1)	
Injured prior to MAW (5 months)	Yes	185 (30)	1970 (38)	<0.01
	No	441 (70)	3213 (62)	
Injured after MAW (5 months)	Yes	122 (20)	1479 (29)	<0.01
	No	504 (81)	3704 (72)	

Table 2 displays demographic survey data from the evaluation sample compared to all Soldiers who completed the pre- and post-MAW surveys. Chi-square p values were calculated to determine how representative the sample population was to the overall population. Results show the

evaluation sample was slightly younger, had lower BMI, had a lower proportion of females, held lower ranks, and had a slightly higher population of smokers.

Table 2. Comparison of Personal Characteristics, Evaluation Sample: Men and Women

Variables	Categories	Initial 6 months		Follow-Up 6 months	
		Surveyed Soldiers n (%)	Evaluation Sample n (%)	Surveyed Soldiers n (%)	Evaluation Sample n (%)
Gender	Males	1813 (91)	595 (95)	1719 (92)	
	Females	177 (9)	31 (5)	143 (8)	
Age	17-22	902 (30)	256 (41)	679 (37)	207 (33)
	23-25	730 (25)	175 (28)	430 (23)	181 (29)
	26-29	672 (23)	110 (18)	388 (21)	138 (22)
	≥ 30	664 (22)	83 (13)	352 (19)	100 (16)
BMI (men only)	< 18.5	18 (1)	8 (1)	11 (1)	5 (1)
	18.5-24.9	772 (39)	257 (44)	627 (37)	205 (35)
	25.0-29.9	930 (47)	271 (46)	832 (49)	294 (50)
	≥ 30	263 (13)	53 (9)	247 (14)	90 (15)
BMI (Women only)	< 18.5	6 (3)	1 (3)	0 (0)	0 (0)
	18.5-24.9	106 (60)	19 (63)	73 (51)	18 (58)
	25.0-29.9	59 (34)	9 (30)	59 (41)	10 (32)
	≥ 30	5 (3)	1 (3)	11 (8)	3 (10)
Rank	O4-O6	28 (1)	1 (<1)	3 (<1)	0 (0)
	O1-O3	89 (5)	20 (3)	97 (5)	21 (3)
	W1-W4	8 (<1)	0 (0)	4 (<1)	0 (0)
	E7-E9	53 (3)	9 (1)	51 (3)	10 (2)
	E4-E6	1321 (67)	370 (60)	991 (53)	422 (67)
	E1-E3	475 (24)	221 (36)	714 (38)	173 (28)
Smoking Status	Non-Smokers	1115 (56)	336 (54)	997 (55)	303 (49)
	Smokers	871 (44)	289 (46)	312 (46)	312 (51)

6.2 Exercise Leader Training

Of the 4,422 Soldiers in the brigade, a total of 320 (8%) Soldiers were signed up to participate in the exercise leader course. A total of 297 (93%) Soldiers participating in 7 or more days of the exercise leader course and 193 (60%) Soldiers completed both the pre- and post-assessments. A majority of Soldiers (68%) participating in the instructor training session were ranked E4 to E5. A range of 4% to 10% of Soldiers from each of the seven battalions participated in the training.

6.3 Physical Training for the Evaluation Group

6.3.1 Unit Physical Training

Table 3 displays reported unit PT activities in the brigade before and after implementation of MAW for the evaluation group (n=626). After implementation of MAW, unit PT included more cross-training exercises, less running, more resistance training, and less road marching, which

corresponds with the changes in activities resulting from implementation of the MAW training program.

Table 3. Unit Physical Training Before and After MAW Implementation, Evaluation Sample: Men and Women

Variable	Categories	Before MAW n (%)	After MAW n (%)	Difference	p -value
Participate in Unit PT	No	18 (3)	17 (3)	0%	0.85 ^a
	Yes	607 (97)	606 (97)	0%	
Perform cross-training type of exercises and types of cross-training performed	No cross-training	161 (27)	137 (23)	-3%	<0.01 ^a
	Basic cross-training	211 (35)	170 (28)	-7%	
	TRX	6 (1)	1 (<1)	0%	
	P90X	7 (1)	5 (1)	0%	
	Extreme Conditioning	102 (17)	150 (25)	+8%	
	Other	13 (2)	9 (2)	0%	
	One or More cross-training programs	108 (18)	131 (22)	+4%	
Frequency of cross-training performed per week	No cross-training	161 (26)	137 (23)	-4%	<0.01 ^b
	1-2 times	323 (55)	247 (41)	-14%	
	3-4 times	83 (14)	167 (28)	+14%	
	> 4 times	27 (5)	50 (8)	+3%	
Frequency of Distance Running per week	No distance running	12 (2)	35 (6)	+4%	<0.01 ^b
	1-2 times	219 (36)	341 (57)	+21%	
	3-4 times	316 (52)	199 (33)	-19%	
	> 4 times	56 (9)	24 (4)	-5%	
Frequency of Sprint Training per week	None	55 (9)	63 (10)	+1%	0.72 ^b
	1-2 times	462 (76)	440 (73)	-3%	
	≥3 times	91 (15)	102 (17)	+2%	
Frequency of agility drills per week	None	335 (55)	272 (46)	-9%	<0.01 ^b
	1-2 times	239 (39)	261 (44)	+5%	
	≥3 times	35 (13)	63 (11)	-2%	
Distance ran per running event	No distance running	15 (3)	46 (8)	+5%	<0.01 ^b
	1 mile	5 (1)	12 (2)	+1%	
	2-3 miles	141 (23)	199 (33)	+10%	
	4-5 miles	374 (62)	281 (46)	-16%	
	> 5 miles	67 (11)	68 (11)	0%	
Total Distance Ran with Unit per week	< 5 miles	57 (10)	141 (26)	+16%	<0.01 ^b
	5-9 miles	213 (37)	221 (40)	+3%	
	10-19 miles	229 (39)	145 (26)	-13%	
	≥20 miles	82 (14)	45 (8)	-6%	
Frequency of Resistance Training per week	No Resistance	269 (44)	67 (11)	-33%	<0.01 ^b
	1-2 times	262 (43)	321 (53)	+10%	
	3-4 times	64 (11)	158 (26)	+15%	
	>4 times	14 (2)	61 (10)	+8%	
Frequency of performing Road Marches per	No Road Marches	22 (4)	73 (13)	+9%	<0.01 ^b
	≤ 1 time	155 (26)	263 (45)	+19%	
	2 times	172 (28)	81 (14)	-14%	

month	3 times	79 (13)	64 (11)	-2%	
	4 times	180 (30)	103 (18)	-12%	
Distance Road Marched, on average	No Road Marches	22 (4)	74 (12)	+8%	<0.01 ^b
	1-3 miles	33 (6)	38 (6)	0%	
	4-6 miles	302 (51)	328 (54)	+3%	
	7-10 miles	193 (32)	126 (21)	-11%	
	> 10 miles	48 (8)	40 (7)	-1%	
Notes: ^a The Marginal Homogeneity Test (Nominal Data) ^b Wilcoxon Signed Rank Test (Ordinal Data)					

6.3.2 Personal Physical Training of the Evaluation Group

Table 4 displays reported personal physical training before and after implementation of MAW among the evaluation group. Physical training during personal time decreased slightly after MAW implementation. The amount of running mileage and resistance training frequency also decreased after implementation of MAW.

Table 4. Personal Physical Fitness Training Before and After MAW Implementation (Evaluation Sample: Men and Women)

Variable	Categories	Before MAW n (%)	After MAW n (%)	Difference	(p -value)
Perform Personal PT	No	97 (16)	125 (20)	+4%	<0.01 ^a
	Yes	525 (84)	496 (80)	-4%	
Total Distance ran for Personal PT	None	201 (33)	235 (39)	+6%	<0.01 ^b
	< 5 miles	227 (37)	235 (39)	+2%	
	5-9 miles	115 (19)	83 (14)	-5%	
	10-19 miles	46 (8)	30 (5)	-3%	
	≥ 20 miles	18 (3)	19 (3)	0%	
Frequency of Resistance Training per week	No Weight Training	194 (31)	218 (35)	+4%	0.02 ^b
	1-2 times	196 (32)	200 (32)	0%	
	3-4 times	159 (26)	138 (22)	-4%	
	≥ 5 times	73 (12)	66 (11)	-1%	
Frequency of Sprint or Interval Training per week	None	320 (51)	321 (52)	+1	0.85 ^b
	1-2 times	247 (40)	241 (39)	-1	
	≥ 3 times	56 (9)	60 (10)	+1	
Notes: ^a McNemar Test (2x2 only) ^b Wilcoxon Signed Rank Test (Ordinal Data)					

6.4 Physical Fitness Performance of the Evaluation Group

6.4.1 Physical fitness assessments

Table 5 displays physical fitness performance before and after implementation of MAW for the evaluation group. Soldiers had lower overall FMS scores, slower unweighted shuttle run times, and lower crossover hop performance after implementation of MAW.

Table 5. Descriptive Statistics for Initial FMS Assessment, Evaluation Sample: FMS Men and Women

Variable		N	Before MAW	N	After MAW	Difference	Paired T-test (p-value)
FMS		436	16.9 ± 2.9	436	16.5 ± 2.5	-0.4	<0.01
Y-Balance	Anterior Difference	432	4.3 ± 4.0	434	4.7 ± 5.6	+0.4	0.17
	Posteromedial Difference	432	5.1 ± 4.4	433	5.2 ± 4.5	+0.1	0.84
	Posterolateral Difference	431	5.3 ± 6.0	433	5.1 ± 4.2	-0.2	0.69
Weighted 300-Yard Shuttle Run		133	87.07 ± 20.12	321	84.78 ± 14.09	-2.29	0.03
Unweighted 300-Yd Shuttle Run		425	70.59 ± 8.28	320	72.40 ± 10.14	+1.81	0.62
Crossover Hops Left		426	194.1 ± 56.9	425	184.0 ± 34.5	-10.10	<0.01
Crossover Hops Right		425	194.1 ± 32.7	425	181.2 ± 33.7	-12.9	<0.01
Pull-ups		381	6.8 ± 4.3	435	6.3 ± 4.5	-0.5	0.37
Vertical Jump		429	22.1 ± 3.3	427	22.3 ± 4.3	+0.2	0.25

Table 6 displays FMS scores before and after implementation of MAW for the evaluation group. The most notable change was that a large number of Soldiers moved from the highest scoring category before implementation of MAW to the middle scoring categories after implementation of MAW. Overall the average FMS score decreased after implementation of MAW as previously shown in Table 5.

Table 6. FMS Frequency Table, Evaluation Sample: FMS Men and Women

FMS Total Score	Initial FMS n (%)	Follow-up FMS n (%)	Difference	p-value (*Wilcoxon)
≤14 pts	69 (16)	61 (14)	-2%	0.02*
15-16 pts	83 (19)	114 (26)	+6%	
17-18 pts	142 (33)	175 (40)	+10%	
19-21 pts	142 (33)	86 (20)	-13%	
Total	436	335		

6.4.2 APFT Performance

Tables 7 and 8 display APFT scores before and after implementation of MAW. Two-mile run times, average push-up repetitions, average sit-up repetitions and total APFT scores all significantly improved among men after implementation of MAW. Improvement in the 2-mile run time was the most notable change. BMI increased slightly (5%) after implementation of MAW (Table 7). Women did not experience any significant changes in APFT performance or BMI (Table 8).

Table 7. Average Physical Fitness Test and BMI Scores, Evaluation Sample: Men

Variable	n	Before MAW (Mean ± SD)	n	After MAW (Mean ± SD)	Difference	Paired T-Test (p-value)
2-Mile Run (min: fraction of a min)	537	14.94±1.54	528	14.54±1.54	- 0.40 or (-24 seconds)	<0.01
Push-Ups (reps)	559	64.3±12.4	554	65.8±12.7	+1.5	<0.01
Sit-Ups (reps)	557	66.6±11.6	555	69.4±11.4	+2.8	<0.01
Total APFT Score	438	243.2±33.0	551	251.5±32.7	+8.3	<0.01
BMI	589	25.5 ±3.37	589	26.7±3.7	+1.2	<0.01

Table 8. Average Physical Fitness Test and BMI Scores, Evaluation Sample Data: Women

Variable	n	Before MAW (Mean ± SD)		After MAW (Mean ± SD)	Difference	Paired T-Test (p-value)
2-Mile Run (min: fraction of a min)	30	17.95±2.27	28	17.79±1.92	- 0.16 or (-10 seconds)	0.95
Push-Ups (reps)	29	42.9±12.8	28	43.3±12.4	+0.4	0.62
Sit-Ups (reps)	29	67.1±12.3	29	70.1±12.4	+3.0	0.29
Total APFT Score	30	248.9±36.7	27	256.4±34.7	+7.5	0.40
BMI	30	23.8 ±3.6	31	24.6±3.73	+0.8	0.13

6.5 Injury

Table 9 displays self-reported injury rates, injury types, body regions and causes of injury before and after implementation of MAW for the evaluation group. Injury rates for the 626 Soldiers who completed both initial and follow-up survey were compared. Twenty-three percent of Soldiers were injured both before and after implementation of MAW ($p = 0.94$).

The top three injury types prior to MAW implementation for men and women included sprain or strain (55%), pain (16%), and broken/fractured bone (6%). After MAW implementation, the top 3 injury types were sprain or strain (51%), pain (15%), and dislocation (8%). The top 3 injury locations prior to MAW implementation were knee (24%), ankle (17%), and lower leg (9%). After MAW implementation the top three injury locations were knee (19%), ankle (19%), and lower back (13%). Running was still the leading cause of injury before (40%) and after MAW (34%). Walking/hiking/road marches were the second leading cause of injury before (24%), but moved to the third leading cause after MAW (13%). Lifting or moving heavy objects moved to the second leading cause of injury after MAW (16%; was 7% prior to MAW).

Table 9. Injury, Evaluation Sample: Men and Women (Type of Injury and Body Part Injured)

Variable	Categories	Before MAW (6 months) n (%)	After MAW (6 months) n (%)	% Differ- ence
Self-Reported Injury	No	473 (77)	472 (77)	0%
	Yes	145 (23)	144 (23)	0%
Type of Injury	Sprain/Strain	64 (55)	65 (51)	-4%
	Pain	19 (16)	19 (15)	0%
	Broken/fracture bone	7 (6)	6 (5)	-3%
	Bruise	6 (5)	4 (3)	-2%
	Tendonitis	6 (5)	3 (2)	-3%
	Dislocation	4 (3)	10 (8)	+4%
	Cut/laceration	3 (3)	1 (1)	-1%
	Blister	3 (3)	2 (2)	0%
	Concussion (TBI)	1 (1)	2 (2)	+1%
	Nerve Injury	0 (0)	3 (2)	+2%
	Loss of body part	0 (0)	1 (1)	+1%
	Burn	0 (0)	2 (2)	+2%
	Abrasion	0 (0)	2 (2)	+2%
	Heat or Cold	0 (0)	1 (1)	+1%
	Other	4 (3)	3 (3)	-1%
Body part injured	Knee	35 (24)	25 (19)	-6%
	Ankle	24 (17)	24 (19)	+3%
	Lower Leg	13 (9)	7 (5)	-5%
	Multiple Upper & Lower	13 (9)	2 (2)	-6%
	Foot	12 (8)	10 (8)	0%
	Shoulder	8 (6)	15 (12)	+5%
	Lower Back	8 (5)	17 (13)	+8%
	Multiple lower body	6 (4)	1 (1)	-3%
	Wrist	4 (3)	3 (2)	-1%
	Hand/Fingers	4 (3)	6 (5)	+2%
	Chest	3 (2)	2 (2)	-1%
	Pelvic Area	3 (2)	3 (2)	-1%
	Abdominal Area	2 (1)	1 (1)	-1%
	Head/Face	3 (2)	3 (2)	0%
	Hip	2 (1)	3 (2)	-1%
	Upper Leg	2 (1)	0 (0)	-1%
	Multiple upper body	2 (1)	1 (1)	0%
	Upper Back	1 (1)	3 (2)	+1%
	Neck	0 (0)	2 (2)	+2%
	Arm	0 (0)	1 (1)	+1%
	Elbow	0 (0)	1 (1)	+1%
Cause of unintentional injury	Running	52 (40)	43 (34)	-9%
	Walking/hiking/road marching	31 (24)	16 (13)	-9%
	Other Exercise	9 (7)	6 (5)	-2%
	Lifting or moving heavy objects	9 (7)	20 (16)	+9%
	Sports	8 (6)	11 (9)	+3%
	Stepping or climbing	5 (4)	7 (6)	+2%
	Riding or driving in a motorized vehicle	5 (4)	5 (4)	+1%
	Repairing equipment or vehicles	1 (1)	1 (1)	0%
	Multiple	0 (0)	5 (4)	+4%
	Other	10 (8)	11 (9)	+1%

Technical Report No. S.0032423.3-11

Prior to MAW implementation, injuries resulted in an estimated 544 days of limited duty per month. After MAW implementation, injuries resulted in an estimated 308 days of limited duty per month. It is important to mention that the change in limited duty may be due to holidays and training leave. In Tables 10 to 12, the top three activities, injury type and body part associated with the greatest number of average LDDs are highlighted in grey. The bold text in Tables 10 to 12 displays average LDDs per month before and after implementation of MAW and the percent change in LDDs per month. The top three activities causing the most LDDs prior to MAW were running, walking/hiking/road marching, and stepping/climbing. After MAW, walking/hiking/road marching, running, and sports participation were the top three activities causing the most LDDs.

Prior to MAW, the top three types of injuries causing the most LDDs per month were sprain/strain, dislocation, and broken/fracture bones. After MAW, sprain/strain, dislocation, and pain were the top three injuries causing the most LDDs. The top three body areas having the most LDDs prior to MAW were the knee, ankle, and lower leg (calf/shin). After MAW implementation, knee, ankle, and lower back were the top three body areas having the most LDDs.

Table 10. Limited Duty Days by Injury Activity, Evaluation Sample: Men and Women^{a,b}

Variable	n Injuries Before MAW	Avg LLDs per injury Before MAW	n Injuries After MAW	Avg LLDs per injury After MAW	Total LDDs Before MAW (Avg LDDs per month)	Total LDDs After MAW (Avg LDDs per month)	% Change in Avg LLDs per month
Running	37	48 ± 48	9	24 ± 27	1763 (294)	212 (35)	- 88%
Walking, Hiking, or Road Marching	16	37 ± 55	4	74 ± 80	586 (98)	294 (49)	- 50%
Stepping or Climbing	4	75 ± 77	1	47 ± 0	301 (50)	47(8)	- 84%
Sports	6	42 ± 29	1	180 ± 0	253 (42)	180 (30)	- 29%
Other Exercise	6	31 ± 30	2	52 ± 54	187 (31)	104 (17)	- 45%
Riding or driving in/on motorized Vehicle	5	37 ± 22	1	90 ± 0	186 (31)	90 (15)	- 52%
Lifting or Moving Heavy Objects	4	41 ± 33	5	20 ± 10	165 (28)	101(17)	-39%
Other	7	15 ± 12	----	----	102 (17)	----	----
Repairing or Maintain Equipment	1	92 ± 0	1	30 ± 0	92 (15)	30(5)	-66%
Multiple	----	----	1	10 ± 0	----	10(1)	----
Total	86		25		3635 (606)	1068 (178)	-71%

Notes:

^a Time span covers 6 months prior to MAW and 6 months after MAW implementation

^b Gray areas represent Top 3 Injury Types with the most limited duty days before and after MAW implementation

Table 11. Limited Duty Days by Injury Type, Evaluation Sample: Men and Women^{a,b}

Variable	n Injuries Before MAW	Avg LLDs per injury Before MAW	n Injuries After MAW	Avg LLDs per injury After MAW	Total LDDs Before MAW (Avg LDDs per mnth)	Total LDDs After MAW (Avg LDDs per mnth)	% Change in Avg LLDs per mnth
Sprain/Strain	40	38 ± 43	15	34 ± 46	1518 (253)	509 (85)	- 66%
Broken/Frac bone	8	53 ± 46	3	67 ± 40	424 (71)	110 (18)	-75%
Tendonitis or Bursitis	6	56 ± 53	2	6 ± 1	338 (56)	12 (2)	- 96%
Cut/Laceration	2	165 ± 21	----	----	330 (55)	----	----
Other	4	57 ± 63	4	19 ± 12	226 (38)	77 (13)	- 66%
Pain	6	31 ± 45	2	60 ± 42	188 (31)	120 (20)	- 35%
Bruise/Contusion	3	40 ± 45	----	----	121 (20)	----	----
Dislocation	2	56 ± 49	2	105 ± 106	111 (19)	210 (35)	+ 84%
Concussion	1	14 ± 0	----	----	14 (2)	----	----
Nerve Injury	----	----	----	----	----	----	----
Burn	----	----	----	----	----	----	----
Heat and Cold	----	----	----	----	----	----	----
Blister	----	----	----	----	----	----	----
Scrap/Abrasion	----	----	----	----	----	----	----
Total	72		28		3270 (545)	1038 (173)	-68%

Notes:
^a Time span covers 6 months prior to MAW and 6 months after MAW implementation
^b Gray areas represent Top 3 Injury Types with the most limited duty days before and after MAW implementation

Table 12. Number of Limited Duty Days by Body Area, Evaluation Sample: Men and Women^{a,b}

Variable	n Injuries Before MAW	Avg LLDs per injury Before MAW	n Injuries After MAW	Avg LLDs per injury After MAW	Total LDDs Before MAW (Avg LDDs per month)	Total LDDs After MAW (Avg LDDs per month)	% Change in Avg LLDs per month
Knee	24	69 ± 60	13	49 ± 51	1650 (275)	641 (107)	- 61%
Ankle	14	29 ± 36	9	30 ± 57	406 (68)	270 (45)	- 34%
Lower leg(Calf/Shin)	12	32 ± 28	2	48 ± 46	389 (65)	95 (16)	- 75%
Shoulder	7	55 ± 50	4	20 ± 12	388 (65)	81 (14)	- 78%
Multiple	9	38 ± 34	1	14 ± 0	340 (57)	14 (2)	- 96%
Lower Back	6	37 ± 27	6	19 ± 10	219 (37)	111 (19)	- 49%
Abdominal Area	3	55 ± 57	1	30 ± 0	164 (27)	30 (5)	- 81%
Pelvic Area	2	52 ± 54	1	5 ± 0	104 (17)	5 (<1)	- 94%
Chest	2	47 ± 62	2	25 ± 7	93 (16)	50 (8)	- 50%
Hand/Fingers	1	84 ± 0	2	45 ± 21	84 (14)	90 (15)	+ 7%
Foot	5	9 ± 8	4	50 ± 46	45 (8)	201 (34)	+325%
Head/Face	1	14 ± 0	----	----	14 (2)	----	----
Wrist	----	----	2	48 ± 60	----	95 (16)	----
elbow	----	----	1	90 ± 0	----	90 (15)	----

Table 12. Number of Limited Duty Days by Body Area, Evaluation Sample: Men and Women^{a,b} (continued)

Variable	n Injuries Before MAW	Avg LLDs per injury Before MAW	n Injuries After MAW	Avg LLDs After MAW	Total LDDs Before MAW (Avg LDDs per month)	Total LDDs After MAW (Avg LDDs per month)	% Change in Avg LLDs per month
Hip	----	----	1	30 ± 0	----	30 (5)	----
neck	----	----	----	----	----	----	----
Arm	----	----	----	----	----	----	----
Upper Back	----	----	----	----	----	----	----
Upper Leg (Thigh)	----	----	----	----	----	----	----
Total	86		49		3896 (649)	1803 (301)	-54%

Notes:
^a Time span covers 6 months prior to MAW and 6 months after MAW implementation
^b Gray areas represent Top 3 Injury Types with the most limited duty days before and after MAW implementation

6.6 Injury Risk Factors for Men

Univariate analysis was performed to evaluate risk factors associated with personal characteristics, unit physical training, personal physical training, and physical performance for all men who participated in MAW and completed both surveys (evaluation sample n=595).

Table 13 displays personal characteristics and physical fitness injury risk factors. Soldiers with the fastest APFT 2-mile run time had a lower injury risk compared to those with the slowest times.

Table 13. Personal Characteristics and Injury Risk Factors, Evaluation Sample: Men (Follow-Up Survey)^a

Variable	Categories	N ¹	Injured	Risk Ratio (95%CI)	p-value
Age	17-21 years	134	22%	1.00	
	22-26 years	270	22%	1.02 (0.69-1.52)	0.89
	27-31 years	121	25%	1.15 (0.73-1.79)	0.55
	≥32 years	61	26%	1.21(0.71-2.06)	0.48
BMI	<25	205	20%	1.00	
	25-29.9	290	25%	0.86 (0.62-1.19)	0.36
	≥30	90	21%	0.98 (0.64-1.52)	0.94
Race	Caucasian	434	23%	1.00	
	American Indian	4	25%	NA	
	Hispanic	76	22%	0.97 (0.62-1.53)	0.90
	Black	48	21%	0.90 (0.51-1.61)	0.73
	Asian	24	29%	1.27 (0.66-2.42)	0.49
Marital Status	Single	306	25%	1.00	
	Married	268	21%	0.83 (0.61-1.12)	0.23
	Other (Separated/ Divorced /Widowed)	12	17%	NA	
Smoking Status	Nonsmoker	278	24%	1.00	
	Smoker	298	23%	0.98(0.73-1.31)	0.87

Table 13. Personal Characteristics and Injury Risk Factors, Evaluation Sample: Men (Follow-Up Survey) ^a (continued)

Variable	Categories	N ¹	Injured	Risk Ratio (95%CI)	p-value
APFT 2-mile run*	≥15.31 (T3)	127	28%	1.00	
	14.10-15.30 (T2)	212	22%	0.79(0.54-1.15)	0.22
	≤ 14.09 (T1)	181	18%	0.64(0.42-0.98)	0.04
APFT Push ups	≤ 57 reps (T3)	141	23%	1.00	
	58-70 reps (T2)	201	24%	1.05(0.71-1.56)	0.80
	≥ 71 reps (T1)	204	21%	0.93(0.62-1.39)	0.72
APFT Sit ups ^b	≤ 64 reps (T3)	174	25%	1.00	
	65-73 reps (T2)	190	24%	0.98(0.68-1.41)	0.91
	≥74 reps (T1)	183	19%	0.75(0.50-1.12)	0.16

Legend: T=Tertile
Note: ^a Not all Soldiers answered all survey questions

Table 14 displays injury risk factors for unit physical training. Soldiers who ran 10 to 19 miles per week with their unit had a higher risk of injury compared to those who ran fewer than 5 miles. Soldiers who road marched two or three times per month had a marginally higher risk of injury compared to those who did not road march. Soldiers who trained for the APFT five or more times per month or fewer than two times per month had a lower or marginally lower risk of injury compared to those who did not train.

Table 14. Injury Risk Factors, Evaluation Sample: Men (Univariate Unit PT) ^a

Variable	Categories	N	Injury (After MAW)	Risk Ratio (95% CI) (After MAW)	p-value
How many times per wk do you perform crosstraining/ECP per week	None	120	22%	1.00	
	1-2 times	231	27%	1.24(0.83-1.85)	0.29
	3-4 times	161	18%	0.83(0.52-1.34)	0.45
	≥5 times	47	21%	0.98(0.51-1.88)	0.96
Frequency of Unit Runs per week	None	31	16%	1.00	
	1-2 times	325	20%	1.26(0.55-2.89)	0.58
	3-4 times	184	29%	1.78(0.78-4.11)	0.14
	≥5 times	22	23%	1.41(0.46-4.29)	0.55
Distance of Unit Runs per time	None	41	20%	1.00	
	1-3 miles	192	22%	1.12(0.57-2.20)	0.74
	4-5 miles	271	22%	1.14(0.59-2.20)	0.70
	≥6 miles	64	33%	1.68(0.82-3.43)	0.14
Estimated weekly running mileage per week	<5 miles	131	18%	1.00	
	5-9 miles	210	21%	1.11(0.71-1.75)	0.63
	10-19 miles	138	32%	1.74(1.13-2.69)	0.01
	≥20 miles	41	24%	1.33(0.70-2.55)	0.39
Frequency of Sprint Training per week	None	53	25%	1.00	
	1-2 times	420	23%	0.93(0.56-1.54)	0.78
	≥3 times	94	23%	0.95(0.53-1.73)	0.88

Table 14. Injury Risk, Evaluation Sample: Men (Univariate Unit PT)^a (continued)

Variable	Categories	N	Injury (After MAW)	Risk Ratio (95% CI) (After MAW)	p-value
Frequency of performing Calisthenics per week	None	83	23%	1.00	
	1-2 times	286	25%	1.10(0.71-1.72)	0.67
	3-4 times	132	20%	0.86(0.51-1.45)	0.58
	≥5 times	68	21%	0.90(0.49-1.66)	0.73
Frequency of resistance training per week	None	61	18%	1.00	
	1-2 times	305	23%	1.29(0.73-2.29)	0.37
	≥3 times	203	24%	1.34(0.74-2.41)	0.32
Frequency of agility drills per week	None	250	22%	1.00	
	1-2 times	250	24%	1.05(0.76-1.45)	0.75
	≥3 times	58	22%	1.00(0.59-1.70)	0.99
Frequency of road marches per month	None	63	16%	1.00	
	<1 time	241	25%	1.57(0.85-2.89)	0.13
	2 times	80	29%	1.81(0.93-3.52)	0.07
	3 times	63	29%	1.80(0.90-3.59)	0.09
	≥4 times	101	14%	0.87(0.41-1.85)	0.72
How heavy is the load when road marching	None	61	16%	1.00	
	0-30 lbs	101	22%	1.33(0.68-2.61)	0.40
	31-50 lbs	342	24%	1.45(0.79-2.63)	0.21
	≥51 lbs	49	25%	1.49(0.71-3.16)	0.29
How far unit road marches per time	None	65	19%	1.00	
	1-3 miles	33	30%	1.64(0.79-3.40)	0.18
	4-6 miles	312	23%	1.25(0.72-2.17)	0.42
	≥7 miles	159	23%	1.26(0.70-2.26)	0.43
How often run with body armor per month	None	240	23%	1.00	
	≤1 time	222	23%	0.98(0.71-1.37)	0.93
	2 time	74	20%	0.87(0.52-1.44)	0.58
	≥3 times	29	24%	1.03(0.52-2.05)	0.92
How far do you run when wearing body armor?	None	239	23%	1.00	
	1 mile	87	20%	0.83(0.51-1.35)	0.46
	2-3 miles	186	24%	1.03(0.73-1.45)	0.85
	≥4 miles	57	23%	0.97(0.57-1.65)	0.92
How often does your unit specifically train for the APFT per month	None	114	31%	1.00	
	<1 time	104	20%	0.66(0.41-1.05)	0.08
	1-2 times	149	22%	0.70(0.46-1.06)	0.09
	3-4 times	99	24%	0.79(0.51-1.23)	0.30
	≥5 times	104	18%	0.60(0.36-0.97)	0.03

Note: ^aNot all Soldiers answered all survey questions

Table 15 displays injury risk factors for personal physical training. Soldiers who performed distance running one to two times per week had a significantly lower risk of injury compared to those who did not run for personal PT.

Table 15. Personal PT and Injury Risk, Evaluation Sample Men

Variable	Categories	N	Injury (After MAW)	Risk Ratio (95% CI)	p-value
Personal PT	No	116	22%	1.00	
	Yes	466	23%	1.03(0.71-1.51)	0.86
Frequency of Distance Running per week	None	215	22%	1.00	
	1-2 times	270	23%	0.81(0.65-1.00)	0.05
	≥3 times	82	20%	0.87(0.53-1.45)	0.60
How far do you distance run per time	None	216	23%	1.00	
	1-3 miles	274	23%	1.01(0.73-1.41)	0.94
	≥4 miles	85	22%	0.99(0.62-1.57)	0.95
Estimated Personal PT Miles ran per week	None	216	23%	1.00	
	<5 miles	220	22%	0.96(0.68-1.37)	0.83
	5-9 miles	125	21%	0.92(0.60-1.40)	0.69
Unit PT and Personal PT total miles run per week	none	33	27%	1.00	
	≤10 miles	232	21%	0.76(0.41-1.40)	0.39
	10.01-15.00 miles	124	24%	0.89(0.47-1.68)	0.72
	15.01-25.00 miles	145	26%	0.96(0.52-1.79)	0.90
	≥25.01 miles	52	19%	0.71(0.32-1.55)	0.39
Frequency of Resistance Training per week	None	203	21%	1.00	
	1-2 times	185	25%	1.23(0.85-1.76)	0.27
	3-4 times	130	19%	0.87(0.56-1.36)	0.55
	≥5 times	65	31%	1.45(0.93-2.28)	0.11
Frequency of Sprint or Interval Training per week	None	302	23%	1.00	
	1-2 times	226	23%	1.00(0.73-1.38)	0.97
	≥3 times	55	24%	1.04(0.62-1.74)	0.90
Personal PT based on	None	200	24%	1.00	
	Traditional Army PT	119	25%	1.05(0.71-1.56)	0.81
	Cross/MAW/ECP	115	18%	0.76(0.48-1.20)	0.24
	Other	61	18%	0.75(0.42-1.35)	0.33
	Multiple	79	29%	1.21(0.79-1.85)	0.38

Multiple multivariable analyses were performed using significant results from the univariate analysis. However, there were no significant findings to report.

7 Discussion

Physical fitness performance among male Soldiers improved slightly after implementation of the MAW program in terms of muscular endurance (push-up and sit-up performance), cardiovascular endurance (2-mile run time) and total APFT score. Although significant, these changes are minimal and not very indicative of improved performance. The amount of long distance running and road marching decreased after implementation of MAW and were replaced with more resistance training. Injury rates remained similar before and after implementation of MAW, while LDDs decreased by 57%. The most common type of injuries was sprains or strains of the lower extremities attributed to physical activity.

7.1 Physical Training

Physical training has been shown to be a large contributor to injuries as previously reported in other studies (Smith et al. 2002, AIPH 2011, Tomlinson et al. 1987). It is important to incorporate physical training that will be the most beneficial while still minimizing injury risk. The MAW program showed a decrease in longer distance running, road marching, and an increase in resistance training.

Studies have shown that the risk of injury increases with more mileage run per week (Koplan et al. 1982, Marti et al. 1984, Samet et al. 1982). A study that included 109 Air Force Combat Controller trainees by AFRL, 2010 found that overuse injuries decreased by 67% after implementation of more “functional” training over an 8-week period and attributed this decrease to less long distance running in the physical training program (AFRL 2010). On the other hand, Soldiers with low cardio-respiratory endurance are also at higher risk of injury (Ruscio et al. 2010, Knapik et al. 2001, Knapik et al. 1993, Jones and Knapik 1999, Grier et al. 2011).

The MAW program has replaced aerobic training, such as long distance running, with short interval running focusing more on anaerobic cardiovascular training. A study showed that high intensity training not only benefited those with sedentary and recreational activity levels, but also helped experienced athletes to continue to see improvements from their workouts when other training effects diminished (Laursen and Jenkins 2002). Another study looking at moderate intensity combined training of aerobic and resistance training reported improvements in cardio-respiratory fitness, weight/fat loss compared to aerobic or resistance training alone (Ho et al. 2012). Within this investigation, the 2-mile APFT run time improved for men by 24 seconds, which might be attributed to the increase in interval running.

Resistance training was a major component of the MAW program. A strength and conditioning coach provided education to Soldiers at the beginning of the program to maximize fitness benefits and minimize associated injuries. This study did not find any differences, however, in injury risk between unit or personal resistance training. This may have been due to the short implementation and evaluation period which was not long enough to see any measurable differences. However, other studies have shown benefit to having a resistance training program, including reduction in injury risk, healthy body fat maintenance, improvements in circulation, better coordination, better balance, and improved bone and ligament strength (Grier (2013), Schmitz (2003)).

Because MAW focused on resistance training and reduced running mileage, there was greater emphasis on concurrent training, unlike traditional PT that emphasizes a heavier workload on aerobic endurance. Past studies have reported a combination of both strength and endurance training promotes increases in muscular strength/power as well as aerobic endurance (Hendrickson et al. 2010, Wilson et al. 2012). Wilson et al. (2012) performed a meta-analysis investigating 21 studies on strength and aerobic conditioning (concurrent training). Results showed fitness gains from concurrent training of strength and endurance were significantly higher compared to endurance training alone (Wilson et al. 2012). Studies have also shown circuit resistance training not only improves strength but also improves aerobic endurance (Hendrickson et al. 2010, Smith and Cashman 2002). A study by Ho et al. (2012) looked at 12 weeks of moderate intensity in aerobic, resistance, and combination (aerobic and resistance) training programs. They observed combination training resulted in a decreased total body fat by 4.4% and improved cardiorespiratory fitness by 13.3% compared to the control group (Ho et al. 2012). A longer evaluation period of the MAW program may result in similar findings.

There have been other studies analyzing newly integrated physical training programs that replaced older more traditional military training methods. These programs were similar to MAW in the aspect of decreased distance running, and more agility, cross-training, strength training, and interval running. One study performed by the U.S. Air Force analyzed a new physical training program utilizing similar methods as the MAW program. This included decreased running mileage and increased interval running, agility drills, and resistance training. They also decreased single joint resistance training and increased functional strength training movements (AFRL 2010).

7.2 Physical fitness assessments

Soldiers had lower FMS scores, slower unweighted shuttle run times, and lower crossover hops performance after implementation of MAW. To our knowledge, there have not been any studies linking FMS scores to changes in fitness performance. FMS scores may have decreased due to factors such as environmental differences (location and temperature) or variability in the way FMS tests were graded. Individuals grading the FMS tests (initial and final) may have scored one more precisely than the other.

7.3 APFT performance

Push-ups repetitions, sit-up repetitions, 2-mile run times, and total APFT scores improved after implementation of MAW in male Soldiers. Significant improvement occurred with 2-mile run times (24 seconds) and total APFT score (an average of 8 points better after MAW) for male Soldiers. There were no significant changes in APFT performance for female Soldiers. When comparing this light infantry brigade's performance to a similar brigade, baseline APFT performance was initially lower and could have been due to recent deployments and block leave (AIPH 2014). This may be why APFT scores appear to improve. Other studies have also found APFT performance improvement after implementation of new physical training programs. A study by the Command and General Staff College (CGSC) showed ECP to increase power output/work capacity by 20% after 8 weeks of training, as measured by average performance from APFT push-ups, Fran (Thrusters and Pull-ups), and Fight Gone Bad testing (three rounds of five different exercises totaling 17 minutes) (CGSC 2010). Another study utilizing Soldiers in Basic Combat Training (BCT) implemented Physical Readiness Training (PRT) which decreases running and increases exercise variety such as calisthenics, dumbbell drills, movement drills, interval training (sprinting), flexibility training, and some running (Knapik et al. 2003). This group was compared to another group of Soldiers utilizing more traditional physical training which emphasizes running. Results showed Soldiers in the PRT group had a higher APFT pass rate compared to the more traditional physical training group (Knapik et al. 2003). Participation in the MAW program appears to provide a benefit to male Soldiers' fitness performance.

7.4 Injury and Injury Rates

Injury rates did not change after implementation of MAW. Several factors may have influenced this outcome. There was a 5-month delay in implementing MAW, so evaluation coincided with Thanksgiving and Christmas holiday leave. During this same time period, Soldiers also deployed to the Joint Readiness Training Center for 1 month. Therefore, Soldiers performed a greater amount of unit PT prior to, compared to after, MAW. Due to the short time span during which MAW implementation was evaluated in this brigade, it is unknown how the program will affect injuries long term and further evaluation is needed.

We expected there to be a greater amount of upper body injuries due to the increase in resistance training and implementation of powerlifting. However, investigation showed lower extremity sprains

and strains to be the leading type of injury both before and after MAW implementation. Similar to this investigation, other studies have also identified sprains and strains as the most common types of injury in the military (Ruscio et al. 2010, Jennings et al. 2008). This investigation found the top causes of injury before and after MAW implementation were running and walking/road marching/hiking. Another study also found top causes of injuries were running, sports and lifting in a similar military population (Jennings et al. 2008).

7.5 Limited duty days

Even though injury rates did not decrease, overall LDDs per month decreased after the implementation of MAW by 44% possibly suggesting the severity of injuries decreased. The observed decrease in LDD's could have also been due to additional Soldier leave around the holiday season. Unit PT participation frequency decreased during the MAW implementation due to holiday schedules, preparing for deployment, and Joint Readiness Training. Therefore, Soldiers were probably exercising less, allowing more time for injuries to heal. Sprains/strains were still the leading cause for LDDs. Even though running activities decreased after implementation of MAW, running was still one of the top activities leading to LDDs. Similar results were found in a study by Ruscio et al. (2010) who showed overuse injuries such as pain, inflammation and stress fractures were associated with a greater number of LDDs. Fractures had the second most LDDs and sprains/strains had the third most LDDs (Ruscio et al. 2010). The study also showed sports and physical training were the leading cause of LDDs (Ruscio et al. 2010).

7.6 Limitations

As with most studies, there are limitations that should be mentioned. An initial analysis showed the subset population that participated in both pre-MAW and post-MAW implementation surveys was younger, more fit, and had a smaller percentage of women. Also, the exposure time for unit level exercising was reduced approximately 20 to 25% during the MAW program due to holiday leave and reduced work weeks prior to deployment. Reducing exercise exposure could have reduced exposure to injury risk and subsequent LDDs after implementation of MAW.

Data on injuries and physical fitness were self-reported, which is both a strength and a weakness. Specifically, the self-reported injury data could include injuries for which the Soldier did not seek medical care, which helps gain a more comprehensive perspective on injuries sustained. However, self-reported data may also be affected by recall bias and honesty in answering questions. Prior analyses of APFT data have shown high correlations (< 0.70) between actual and self-reported data (Jones et al. 2007).

8 Conclusions and Recommendations

This evaluation showed no change in injury rates after implementation of the MAW Program. However, this timeframe also included a reduced amount of physical training due to leave. Hence, no recommendation can be made for or against implementation of MAW based on the results of this study.

Improvements in physical fitness were most likely due to high intensity exercise and reduced long distance running. There is a need to find the most beneficial balance between long distance running, high intensity training, and resistance training which maximizes performance and minimizes injury risk.

Technical Report No. S.0032423.3-11

Further investigation and analysis of the MAW program in other Army units and for longer durations of implementation may provide insight into the fitness benefits and/or injury risk associated with the program.

9 Points of Contact

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Appendix A

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Appendix B

Supplemental Tables

Table B-1. Survey Results: Unit Physical Training Before and After the Implementation of MAW for Men and Women (Evaluation Sample Data)

Variable	Categories	Before MAW n (%)	After MAW n (%)	Difference	p -value
Participate in Unit PT	No	18 (3)	17 (3)	0%	0.85 ^b
	Yes	607 (97)	606 (97)	0%	
How Often Participate in Unit PT per week	< 5 times	65 (11)	97 (16)	+5%	0.02 ^c
	5-7 times	497 (82)	465 (77)	-5%	
	>7 times	45 (7)	43 (7)	0%	
Do You Participate in Alternate PT?	No	524 (89)	557 (93)	+4%	<0.01 ^b
	Profile PT	31 (5)	22 (6)	+1%	
	Weight Control PT	14 (2)	10 (1)	-1%	
	Pregnancy PT	1 (<1)	0 (0)	----	
	Other	21 (4)	6 (1)	-3%	
Perform cross-training type of exercises and types of cross-training performed	No cross-training	146 (24)	128 (21)	-3%	<0.01 ^b
	Basic cross-training	217 (36)	172 (29)	-7%	
	TRX	6 (1)	1 (<1)	0%	
	P90X	7 (1)	7 (1)	0%	
	Extreme Conditioning	101 (17)	153 (25)	+8%	
	Other	13 (2)	9 (2)	0%	
	One or More cross-training programs	109 (18)	133 (22)	+4%	
Frequency of cross-training performed per week	No cross-training	156 (26)	133 (22)	-4%	<0.01 ^c
	1-2 times	326 (55)	247 (41)	-14%	
	3-4 times	83 (14)	167 (28)	+14%	
	> 4 times	27 (5)	50 (8)	+3%	
Frequency of Distance Running per week	No distance running	12 (2)	35 (6)	+4%	<0.01 ^c
	1-2 times	219 (36)	341 (57)	+21%	
	3-4 times	316 (52)	199 (33)	-19%	
	> 4 times	56 (9)	24 (4)	-5%	
Distance ran with Unit	No distance running	15 (3)	46 (8)	+5%	<0.01 ^c
	1 mile	5 (1)	12 (2)	+1%	
	2-3 miles	141 (23)	199 (33)	+10%	
	4-5 miles	374 (62)	281 (46)	-16%	
	> 5 miles	67 (11)	68 (11)	0%	
Total Distance Ran with Unit per week	< 5 miles	57 (10)	141 (26)	+16%	<0.01 ^c
	5-9 miles	213 (37)	221 (40)	+3%	
	10-19 miles	229 (39)	145 (26)	-13%	
	>=20 miles	82 (14)	45 (8)	-6%	

Table B-1. Survey Results: Unit Physical Training Before and After the Implementation of MAW for Men and Women (Evaluation Sample Data) (continued)

Variable	Categories	Before MAW n (%)	After MAW n (%)	Difference	p -value
Frequency of Sprint/Interval Training per week	No Sprints	55 (9)	63 (10)	+1%	0.72 ^c
	1-2 times	462 (76)	440 (73)	-3%	
	3-4 times	84 (14)	88 (15)	+1%	
	> 4 times	7 (1)	14 (2)	+7%	
Frequency of Calisthenics per week	No Calisthenics	71 (12)	93 (15)	+3%	0.04 ^c
	1-2 times	308 (51)	304 (50)	-1%	
	3-4 times	146 (24)	139 (23)	-1%	
	> 4 times	83 (14)	71 (12)	-2%	
Frequency of Resistance Training per week	No Resistance	269 (44)	67 (11)	-33%	<0.01 ^c
	1-2 times	262 (43)	321 (53)	+10%	
	3-4 times	64 (11)	158 (26)	+15%	
	>4 times	14 (2)	61 (10)	8%	
Frequency of Agility Drills per week	No Agility Drills	335 (55)	272 (46)	-9%	<0.01 ^c
	1-2 times	239 (39)	261 (44)	+5%	
	3-4 times	30 (5)	52 (9)	+4%	
	>4 times	5 (1)	11 (2)	+1%	
Frequency of performing Road Marches per month	No Road Marches	22 (4)	73 (13)	+9%	<0.01 ^c
	≤ 1 time	155 (26)	263 (45)	+19%	
	2 times	172 (28)	81 (14)	-14%	
	3 times	79 (13)	64 (11)	-2%	
	4 times	180 (30)	103 (18)	-12%	
Weight of Load carried while Road Marching	No Road Marches	21 (4)	70 (12)	+8%	<0.01 ^c
	0-15 lbs	13 (2)	9 (2)	0%	
	16-30 lbs	124 (21)	99 (17)	-4%	
	31-50 lbs	398 (66)	359 (61)	-5%	
	> 50 lbs	48 (8)	5 (9)	+1%	
Distance Road Marched	No Road Marches	22 (4)	74 (12)	+8%	<0.01 ^c
	1-3 miles	33 (6)	38 (6)	0%	
	4-6 miles	302 (51)	328 (54)	+3%	
	7-10 miles	193 (32)	126 (21)	-11%	
	> 10 miles	48 (8)	40 (7)	-1%	
Frequency of running while wearing body armor per week	No Body Armor	339 (56)	261 (43)	-13%	<0.01 ^c
	≤ 1 time	170 (28)	237 (39)	+11%	
	2 times	64 (11)	76 (13)	+2%	
	≥ 3 times	30 (5)	29 (5)	0%	
Distance run while wearing body armor	No Body Armor	372 (62)	260 (43)	-19%	<0.01 ^c
	0-1 mile	79 (13)	95 (16)	+3%	
	2-3 miles	123 (20)	191 (32)	+12%	
	> 3 miles	29 (5)	61 (10)	+5%	
Frequency of exercising in the swimming pool per month	No swimming	480 (79)	502 (83)	+4%	0.02 ^c
	< 1 time	80 (13)	74 (12)	-1%	
	1-2 times	30 (5)	25 (4)	-1%	
	≥ 3 times	16 (3)	7 (1)	-2%	

Table B-1. Survey Results: Unit Physical Training Before and After the Implementation of MAW for Men and Women (Evaluation Sample Data) (continued)

Variable	Categories	Before MAW n (%)	After MAW n (%)	Difference	p -value
Frequency of training for the APFT per month	No APFT training	95 (16)	125 (21)	+5%	<0.01 ^c
	< 1 time	76 (13)	113 (19)	+6%	
	1-2 times	173 (29)	157 (26)	-3%	
	3-4 times	129 (21)	104 (17)	-4%	
	≥ 5 times	129 (21)	109 (18)	-3%	
Do you lead PT for your squad or platoon	No	448 (74)	438 (72)	-2%	0.58 ^a
	Yes	161 (26)	168 (28)	+2%	

Notes:

^a McNemar Test (2x2 only)

^b The Marginal Homogeneity Test (Nominal Data)

^c Wilcoxon Signed Rank Test (Ordinal Data)

Table B-2. Survey Results: Personal Physical Fitness Training Before and After the Implementation of MAW for Men and Women (Evaluation Sample Data)

Variable	Categories	Before MAW n (%)	After MAW n (%)	Difference	(p -value)
Perform Personal PT	No	97 (16)	125 (20)	+4%	<0.01 ^a
	Yes	525 (84)	496 (80)	-4%	
Frequency of Distance Running per week	No Distance Running	207 (33)	231 (38)	+5%	<0.01 ^c
	1-2 times	286 (46)	288 (48)	+2%	
	3-4 times	103 (17)	64 (11)	-6%	
	≥ 5 times	28 (5)	23 (4)	-1%	
Distance ran during Personal PT	No Distance Running	196 (32)	232 (38)	0%	<0.01 ^c
	1 mile	41 (7)	51 (8)	+1%	
	2-3 miles	275 (44)	240 (39)	-5%	
	4-5 miles	93 (15)	67 (11)	-4%	
	≥ 6 miles	17 (3)	23 (4)	+1%	
Total Distance ran for Personal PT	< 5 miles	227 (56)	235 (64)	+8%	0.01 ^c
	5-9 miles	115 (28)	83 (23)	-5%	
	10-19 miles	46 (11)	30 (8)	-2%	
	≥ 20 miles	18 (4)	19 (5)	+1%	
Frequency of Resistance Training per week	No Weight Training	194 (31)	218 (35)	+4%	0.02 ^c
	1-2 times	196 (32)	200 (32)	0%	
	3-4 times	159 (26)	138 (22)	-4%	
	≥ 5 times	73 (12)	66 (11)	-1%	
Frequency of Sprint Training per week	No Sprints	320 (51)	321 (52)	+1%	0.85 ^c
	1-2 times	247 (40)	241 (39)	-1%	
	≥ 3 times	56 (9)	60 (10)	+1%	

Table B-2. Survey Results: Personal Physical Fitness Training Before and After the Implementation of MAW for Men and Women (Evaluation Sample Data) (continued)

Variable	Categories	Before MAW n (%)	After MAW n (%)	Difference	(p -value)
Personal PT based on	I don't have a personal PT prgrm	212 (35)	312 (50)	+15%	<0.01 ^b
	Traditional PT	127 (21)	58 (9)	-12%	
	Cross-training/ECP/MAW	126 (21)	118 (19)	-2%	
	Other	65 (11)	39 (6)	-5%	
	Multiple	82 (13)	96 (15)	+2%	

Notes:

^a McNemar Test (2x2 only)

^b The Marginal Homogeneity Test (Nominal Data)

^c Wilcoxon Signed Rank Test (Ordinal Data)

Table B-3. Survey Results: Tobacco Use for Men and Women (Evaluation Sample Data)

Variable	Categories	Before MAW n (%)	After MAW n (%)	Difference	p-value
Tobacco Smoker	No	336 (54)	303 (49)	-6%	<0.01 ^a
	Yes	289 (46)	312 (51)	+5%	
Smoked ≥ 100 cigarettes	No	256 (41)	229 (37)	-4%	<0.01 ^b
	Yes	369 (59)	386 (63)	+4%	
How old when smoked first cigarette?	≤ 18 years old	355 (79)	355 (80)	+1%	0.16 ^c
	>18 years old	92 (21)	91 (20)	0%	
How many days smoked in the last 30 days	≤ 15 days	61 (20)	76 (25)	+5%	0.08 ^a
	16+ days	250 (80)	230 (75)	-5%	
# Cigarettes smoked per day on average during last 30 days	Non-Smoker	304 (50)	278 (47)	-3%	<0.01 ^c
	1-10 cigarettes	219 (36)	208 (35)	-1%	
	11-20 cigarettes	77 (13)	87 (15)	+2%	
	≥21 cigarettes	8 (1)	15 (3)	+2%	
Number of years smoking cigarettes	Non-Smoker	329 (54)	285 (51)	-3%	<0.01 ^c
	0-5 years	130 (21)	123 (22)	+1%	
	6-10 years	92 (15)	86 (15)	0%	
	≥11 years	56 (9)	65 (12)	+3%	
Smokeless Status	Non-Smokeless	450 (73)	441 (72)	-1%	0.47 ^a
	Smokeless User	169 (27)	174 (28)	+1%	
# Days used smokeless tobacco in the last 30 days	≤ 15 days	78 (47)	65 (44)	-3%	0.54 ^a
	16+ days	87 (53)	83 (56)	+3%	
How much smokeless tobacco used per day on average in the last 30 days	Non-Smokeless	447 (74)	443 (75)	+1%	0.02 ^c
	≤1cans pouches or plugs	105 (17)	109 (18)	+1%	
	2 cans, pouches or plugs	14 (2)	29 (5)	+3%	
	≥3 cans, pouches or plugs	41 (7)	10 (2)	-5%	

Table B-3. Survey Results: Tobacco Use for Men and Women (Evaluation Sample Data) (continued)

Variable	Categories	Before MAW n (%)	After MAW n (%)	Difference	p-value
Number of years using smokeless tobacco	Non-Smokeless	464 (77)	463 (79)	+2%	<0.01 ^c
	0-5 years	86 (14)	52 (9)	-5%	
	6-10 years	31 (5)	30 (5)	0%	
	≥ 11 years	21 (4)	41 (7)	+3%	

Notes:

^a McNemar Test (2x2 only)

^b The Marginal Homogeneity Test (Nominal Data)

^c Wilcoxon Signed Rank Test (Ordinal Data)

Table B-4. Injury Evaluation Sample Male and Females (Injury Activity and Medical Care)

Variable	Categories	Before MAW (6 months) n (%)	After MAW (6 months) n (%)	Difference
What were you doing when your most recent injury occurred?	Performing military duties or training, but not deployed.	122 (84)	93 (71)	-12%
	Performing military duties or training, while deployed	8 (6)	5 (4)	-1%
	Doing leisure activities	15 (10)	34 (26)	+14%
Was your most recent injury intentional or unintentional	Accidental /unintentional	139 (98)	125 (95)	-3%
	Intentional by someone else, including battle injuries	1 (2)	6 (5)	+3%
If unintentional what activity were you doing?	Riding or driving in a motorized vehicle	5 (4)	5 (4)	+1%
	Walking, hiking, or road marching	31 (24)	16 (13)	-9%
	Running	52 (40)	43 (34)	-9%
	Sports	8 (6)	11 (9)	+3%
	Other Exercise	9 (7)	6 (5)	-2%
	Stepping or climbing	5 (4)	7 (6)	+2%
	Lifting or moving heavy objects	9 (7)	20 (16)	+9%
	Repairing equipment or vehicles	1 (1)	1 (1)	0%
	Other	10 (8)	11 (9)	+1%
	Multiple	0 (0)	5 (4)	+4%
If unintentional how did the injury occur?	Fall, jump, trip or slip	51 (38)	53 (42)	+2%
	Struck against or by an object/ person	3 (2)	7 (6)	+3%
	Cut by a sharp instrument	4 (3)	3 (2)	-1%
	Overexertion, strenuous or rep. movement	65 (49)	51 (40)	-8%
	Fire, hot substance or steam	0 (0)	0 (0)	0%
	Environmental factors	0 (0)	1 (1)	+1%
	Other	11 (8)	11 (9)	+1%
Did you seek medical care?	No	29 (21)	50 (36)	+16%
	Yes	110 (79)	91 (65)	-15%
Were you hospitalized?	No	135 (98)	133 (96)	-2%
	Yes	3 (2)	6 (4)	+2%

Table B-4. Injury Evaluation Sample Male and Females (Injury Activity and Medical Care) (continued)

Variable	Categories	Before MAW (6 months) n (%)	After MAW (6 months) n (%)	Difference
Were you placed on profile or limited duty	No	53 (38)	71 (50)	+13%
	Yes	86 (62)	71 (50)	-13%
If yes how many days?	≤29 days	42 (53)	28 (53)	+4%
	≥30 days	38 (48)	25 (47)	-4%

Table B-5. Injury Evaluation Sample Male and Females (Type of Injury and Body Part Injured)

Variable	Categories	Before MAW (6 months) n (%)	After MAW (6 months) n (%)	Difference
Self-Reported Injury	No	473 (77)	472 (77)	0%
	Yes	145 (23)	144 (23)	0%
Type of Injury	Sprain/Strain	64 (55)	65 (51)	-4%
	Dislocation	4 (3)	10 (8)	+4%
	Broken/fx bone	7 (6)	6 (5)	-3%
	Bruise	6 (5)	4 (3)	-2%
	Abrasion	0 (0)	2 (2)	+2%
	Cut/laceration	3 (3)	1 (1)	-1%
	Loss of body part	0 (0)	1 (1)	+1%
	Tendonitis	6 (5)	3 (2)	-3%
	Nerve Injury	0 (0)	3 (2)	+2%
	Concussion (TBI)	1 (1)	2 (2)	+1%
	Blister	3 (3)	2 (2)	0%
	Burn	0 (0)	2 (2)	+2%
	Pain	19 (16)	19 (15)	0%
	Heat or Cold	0 (0)	1 (1)	+1%
	Other	4 (3)	3 (3)	-1%
Body part injured	Upper & lower body	13 (9)	2 (2)	-4%
	Lower body	97 (67)	73 (56)	-11%
	Upper body	35 (24)	55 (42)	+17%
Body part injured	Head/Face	3 (2)	3 (2)	0%
	Neck	0 (0)	2 (2)	+2%
	Shoulder	8 (6)	15 (12)	+5%
	Arm	0 (0)	1 (1)	+1%
	Elbow	0 (0)	1 (1)	+1%
	Wrist	4 (3)	3 (2)	-1%
	Hand/Fingers	4 (3)	6 (5)	+2%
	Chest	3 (2)	2 (2)	-1%
	Upper Back	1 (1)	3 (2)	+1%
	Abdominal Area	2 (1)	1 (1)	-1%
	Lower Back	8 (5)	17 (13)	+8%
	Hip	2 (1)	3 (2)	-1%
	Pelvic Area	3 (2)	3 (2)	-1%
	Upper Leg	2 (1)	0 (0)	-1%

Table B-5. Injury Evaluation Sample Male and Females (Type of Injury and Body Part Injured) (continued)

Variable	Categories	Before MAW (6 months) n	After MAW (6 months)	Difference
Body part injured	Knee	35 (24)	25 (19)	-6%
	Lower Leg	13 (9)	7 (5)	-5%
	Ankle	24 (17)	24 (19)	+3%
	Foot	12 (8)	10 (8)	0%
	Multiple Upper & Lower	13 (9)	2 (2)	-6%
	Multiple lower body	6 (4)	1 (1)	-3%
	Multiple upper body	2 (1)	1 (1)	0%

Table B-6. Injury Evaluation Sample Male and Females (Limited Duty Days)

Variable	n Injuries Before MAW	Avg LLDs 6 Months per injury Before MAW	n Injuries After MAW	Avg LLDs 6 Months After MAW	Total LDDs 6 months Before MAW (Avg LDDs per month)	Total LDDs 6 months After MAW (Avg LDDs per month)	Change in Avg LLDs per month
Overexertion, strenuous, of repetitive movements	41	42 ± 45	22	33 ± 43	1732 (289)	717 (120)	- 58%
Fall, jump, trip or slip	36	43 ± 45	19	40 ± 45	1544 (257)	761 (127)	- 51%
Struck against or struck by an object or person	5	44 ± 42	4	41 ± 34	222 (37)	164 (27)	- 27%
Cut by a sharp instrument, tool, or object	2	117 ± 47	1	30 ± 0	234 (39)	30 (5)	- 87%
Fire, hot substance or object, or steam	----	----	----	----	----	----	----
Environmental factors such as heat or cold	----	----	----	----	----	----	----
Breathing or swallowing dust, particle, fumes	----	----	----	----	----	----	----
Other	4	43 ± 53	3	18 ± 13	172 (29)	55 (9)	- 69%
Total	88		49		3904 (650)	1672 (279)	- 57%

Table B-7. Survey Results: Number of Limited Duty Days by Injured Body Area for Evaluation Sample Men and Women (n=626) (Those who completed both the Initial and Follow-up Survey)

Variable	n Injuries Before MAW	Avg LLDs 6 Months per injury Before MAW)	n Injuries After MAW	Avg LLDs 6 Months After MAW	Total LDDs 6 months Before MAW (Avg LDDs per month)	Total LDDs 6 months After MAW (Avg LDDs per month)	Change in Avg LLDs per month
Upper Body	20	48 ± 41	18	30 ± 25	962 (160)	547 (91)	+ 82%
Lower Body	61	44 ± 48	31	41 ± 48	2663 (444)	1256 (209)	+ 5%
Upper & Lower Body	9	38 ± 34	1	14 ± 0	340 (57)	14 (2)	+ 78%
Total	90		50		3965 (660)	1817 (303)	+32%

Table B-8. ROC Curve Analysis (Evaluation Sample Survey Men and Women) from Prospective 6-Month Self-Reported Any Injury

Cut Point	Overuse	Sensitivity	Specificity	^a Area under curve
22.13 in.	Vertical Jump	0.608	0.533	0.571
194.5 cm	Crossover Hops Left	0.603	0.493	0.539
81.90 seconds	Weighted 300-Yard Shuttle Run	0.591	0.515	0.533
15.29 min.sec	2-Mile Run Time	0.558	0.389	0.451
3.75 cm	Posterolateral Difference	0.539	0.534	0.508
188.75 cm	Crossover Hops Right	0.534	0.598	0.556
3.25 cm	Anterior Difference	0.526	0.507	0.534
6.50 reps	Pull-ups	0.515	0.465	0.472
68.40 seconds	Unweighted 300-Yd Shuttle Run	0.466	0.537	0.484
3.25 cm	Posteromedial Difference	0.434	0.564	0.505
14 points	FMS	0.221	0.850	0.575
Note: ^a Area under the curve is independent of individual cut points				

Appendix C

Initial Survey

PRIVACY ACT STATEMENT – HEALTH CARE RECORDS, FITNESS TEST SCORES, AND QUESTIONNAIRE	
1. AUTHORITY FOR COLLECTION OF INFORMATION INCLUDING SOCIAL SECURITY NUMBER	
Public Law 104-191, Section 1178; Executive Order 9397; Section 8103, Title 5, United States Code	
2. PRINCIPLE PURPOSES FOR WHICH INFORMATION IS INTENDED TO BE USED	
This form provides you the advice required by the Privacy Act of 1974. The information obtained from this project will be used to determine if cross-training types of physical fitness programs have an effect on injuries, limited duty days, and physical fitness. We will need to obtain your social security number in order to link your questionnaire information with other data such as Army Physical Fitness Test (APFT) scores and information on injuries you may have had in the last year. Using your social security number is the only way we can do this. We will strictly limit access to your social security number by shredding all paper files after scanning, having all computer files password protected, and removing SSNs and name after data are linked. The questionnaire is to obtain information on current physical fitness activities, tobacco use, dietary habits and previous or current injuries.	
3. ROUTINE USES	
The primary use of this information is to improve the health and fitness of 4 ID Soldiers. The data obtained from the questionnaires will be included in a database that contains the same information for all Soldiers participating in this project. The only personnel having access to this information will be the public health officials who will analyze the information. You will not be personally identified in any report or any output of any type since the interest is in the health and fitness of the Unit and not the health and fitness of any single individual. The database that is established will identify current level of fitness by unit, current unit injury trends, and factors that lower Soldiers' risk of injury and enhance fitness. The database will be used to make recommendations to decision makers regarding programs and policies that might improve fitness and reduce the incidence of injury.	
4. WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION	
Disclosure of the requested information is voluntary. If you do not disclose the information you will not be included in the database and you will not participate in the project designed to reduce injuries and improve the health and fitness of Soldiers in your Unit.	
SIGNATURE OF PARTICIPANT	DATE

Physical Training and Injury Initial Survey

Directions: Please carefully read the directions for each section. Be sure to darken bubbles completely. Do not use checks or “x”s to fill in the bubbles. Not filling in the circles completely may result in scanning errors. Please be sure to write legibly where a written answer is required.

Background Details

1. Today's date: / /
DAY MONTH YEAR
2. What is your name?

LAST NAME

FIRST NAME

MIDDLE INITIAL
3. What is your SSN? - -
4. What is your birth date? / /
DAY MONTH YEAR
5. Are you...
☐ ₀ Male
☐ ₁ Female
6. What is your component?
☐ ₁ Regular Army
☐ ₂ Army Reserve
☐ ₃ National Guard
7. When did you in-process with this BDE?
 /
MONTH YEAR
8. What is your current Battalion?

Technical Report No. S.0032423.3-11

9. What is your company, troop, battery or FSC?

- O₁ A
- O₂ B
- O₃ C
- O₄ D
- O₅ E
- O₆ F
- O₇ G
- O₈ HHC or HHB or HHT
- O₉ REPL
- O₁₀ REAR D
- O₁₁ Other _____

10. What is your Military Occupational Specialty (MOS)?

11. What is your duty MOS while deployed?

12. What is your rank?

- | | | | | | | | | |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|
| O ₁ E1 | O ₂ E2 | O ₃ E3 | O ₄ E4 | O ₅ E5 | O ₆ E6 | O ₇ E7 | O ₈ E8 | O ₉ E9 |
| O ₁₀ O1 | O ₁₁ O2 | O ₁₂ O3 | O ₁₃ O4 | O ₁₄ O5 | O ₁₅ O6 | | | |
| O ₁₆ W1 | O ₁₇ W2 | O ₁₈ W3 | O ₁₉ W4 | O ₂₀ W5 | | | | |

13. Have you been deployed?

- O₀ No
- O₁ Yes

14. If yes, how many times have you been deployed?

- O₀ I haven't been deployed
- O₁ 1 time
- O₂ 2 times
- O₃ 3 times
- O₄ 4 or more times

15. If yes, where were you deployed? (select all that apply)

- O₀ I haven't been deployed
- O₁ OEF
- O₂ OIF
- O₃ Other _____ (please specify)

Unit Physical Fitness Training (PT)

The following questions will ask about unit physical fitness training. Unit physical fitness training is defined as: exercising (i.e., road marching, running, calisthenics, or strength training) with a group of soldiers, such as a squad, platoon, or company.

16. What physical training program did you perform at your prior assignment (before in-processing with 4 ID)? (select all that apply)

- ☐ ₁ Traditional Army PT (distance running, pushups, situps)
- ☐ ₂ Cross-training (a variety of exercises, such as, agility drills, sprints)
- ☐ ₃ TRX
- ☐ ₄ P90X
- ☐ ₅ Crossfit
- ☐ ₆ Other (please name) _____

17. Do you currently participate in unit PT (i.e., road marching, running, calisthenics, or strength training with your unit)?

- ☐ ₁ Yes
- ☐ ₀ No (if no, skip to question 39)

18. On average, how often do you participate in unit PT each week?

- ☐ ₁ Less than 5 times per week
- ☐ ₂ 5-7 times per week
- ☐ ₃ 8-14 times per week
- ☐ ₄ More than 14 times per week

19. Do you participate in any Army specific alternative PT programs? If yes, which (select all that apply):

- ☐ ₀ I do not participate in any alternative PT programs
- ☐ ₁ Profile PT
- ☐ ₂ Weight Control PT
- ☐ ₃ Pregnancy PT
- ☐ ₄ Other (please name) _____

20. Who **usually** leads your unit's physical training sessions? (select all that apply)

- ☐ ₁ Squad leader
- ☐ ₂ Platoon SGT
- ☐ ₃ Platoon leader
- ☐ ₄ Company 1st SGT
- ☐ ₅ Company Commander
- ☐ ₆ Unspecified Soldier who has attended fitness training
- ☐ ₇ Other (please name) _____

21. In the past 12 months, did your unit perform cross-training type exercise programs? If so, which one (select all that apply):

Cross-training is defined as a program that involves a variety of exercises, such as strength training, agility drills, sprints, plyometrics, etc.

- ☐ ₀ Do not perform cross-training type exercise programs
- ☐ ₁ Basic cross-training types of exercises
- ☐ ₂ TRX
- ☐ ₃ P90X
- ☐ ₄ Crossfit
- ☐ ₅ Other (please name) _____

22. If your unit performed cross-training types of exercise programs in the past 12 months, approximately how many times per week?

- ☐ 0 Do not perform cross-training type exercise programs
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

23. During the last 12 months, on average, how many times per week did your unit perform distance running (i.e., running continuously for 1 mile or greater)?

- ☐ 0 Our unit does not perform distance running
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

24. During the last 12 months, on average, how far did you run when your unit performed distance running?

- ☐ 0 I don't perform distance runs with my unit
- ☐ 1 1 mile
- ☐ 2 2-3 miles
- ☐ 3 4-5 miles
- ☐ 4 6-7 miles
- ☐ 5 More than 7 miles

25. During the last 12 months, on average, how many times per week did your unit perform sprint or interval-style running? **Sprints are short bursts of speed that cannot be sustained for more than a few minutes. Intervals are short periods of high speed running mixed with periods of jogging or walking.**

- ☐ 0 Our unit does not perform sprint or interval running
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

26. During the last 12 months, on average, how many times per week did your unit perform calisthenics (i.e., jumping jacks, windmills, mountain climbers, etc.)?

- ☐ 0 Our unit does not perform calisthenics
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

27. During the last 12 months, on average, how many times per week did your unit perform resistance training (i.e., weight lifting using free weights, dumbbells, kettlebells, hammer-strength machines, etc.)?

- ☐ 0 Our unit does not resistance train
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

28. During the last 12 months, on average, how many times per week did your unit perform agility drills (i.e., drills requiring lateral movements, typically using cones or ladders, obstacle course, etc.)?

- ☐ ₀ Our unit does not perform agility drills
- ☐ ₁ 1-2 times per week
- ☐ ₂ 3-4 times per week
- ☐ ₃ 5-6 times per week
- ☐ ₄ More than 6 times per week

29. During the last 12 months, on average, how often did your unit perform road marches?

- ☐ ₀ Our unit does not perform road marches
- ☐ ₁ Less than one time per month
- ☐ ₂ 2 times per month
- ☐ ₃ 3 times per month
- ☐ ₄ 4 times per month or once a week

30. On average, how heavy is the load you carry when your unit performs road marches?

- ☐ ₀ Our unit does not perform road marches
- ☐ ₁ 0-15 pounds
- ☐ ₂ 16-30 pounds
- ☐ ₃ 31-50 pounds
- ☐ ₄ 51-75 pounds
- ☐ ₅ More than 75 pounds

31. On average, how far does your unit road march at a time?

- ☐ ₀ Our unit does not perform road marches
- ☐ ₁ 1-3 miles
- ☐ ₂ 4-6 miles
- ☐ ₃ 7-10 miles
- ☐ ₄ 11-15 miles
- ☐ ₅ More than 15 miles

32. During the last 12 months, on average, how often does your unit run for exercise while wearing body armor?

- ☐ ₀ Our unit does not run in body armor
- ☐ ₁ Less than one time per month
- ☐ ₂ 2 times per month
- ☐ ₃ 3 times per month
- ☐ ₄ 4 times per month or once a week

33. On average, how far does your unit run when wearing body armor?

- ☐ ₀ Our unit does not run in body armor
- ☐ ₁ 0-1 mile
- ☐ ₂ 2-3 miles
- ☐ ₃ 4-5 miles
- ☐ ₄ 6-7 miles
- ☐ ₅ More than 7 miles

34. During the last 12 months, on average, how often does your unit perform physical training in the swimming pool?

- ☐ ₀ Our unit does not perform physical training in the swimming pool
- ☐ ₁ Less than 1 time per month
- ☐ ₂ 1-2 times per month
- ☐ ₃ 3-4 times per month
- ☐ ₄ 5-6 times per month
- ☐ ₅ More than 6 times per month

35. During the last 12 months, how often did your unit specifically train for the APFT (i.e., pushup/sit-ups/2 mile run)?

- ☐ ₀ Our unit does not specifically train for the APFT
- ☐ ₁ Less than 1 time per month
- ☐ ₂ 1-2 times per month
- ☐ ₃ 3-4 times per month
- ☐ ₄ 5-6 times per month
- ☐ ₅ More than 6 times per month

36. Who develops your unit's physical training calendar?

37. Do you lead PT for your squad or platoon?

- ☐ ₁ Yes
- ☐ ₀ No

38. If you do lead PT for your squad or platoon have you attended a training or certification course on fitness?

- ☐ ₂ Do not lead PT
- ☐ ₁ Yes
- ☐ ₀ No

Personal Physical Fitness Training (PT)
--

following questions will ask about your personal physical fitness training (PT). Personal PT is any physical fitness training *not* conducted with your unit. Please answer these questions with regard to your *current* personal PT program.

The

39. Do you perform PT on your own time?

- ☐ ₁ Yes
- ☐ ₀ No

40. During the last 12 months, on average, how many times per week did you perform distance running for personal PT (i.e., running continuously for 1 mile or more)?

- ☐ ₀ I don't perform distance runs on my own
- ☐ ₁ 1-2 times per week
- ☐ ₂ 3-4 times per week
- ☐ ₃ 5-6 times per week
- ☐ ₄ More than 6 times per week

41. During the last 12 months, on average, how far did you run when you perform distance runs for personal PT?

- ☐ ₀ I don't perform distance runs on my own
- ☐ ₁ 1 mile
- ☐ ₂ 2-3 miles
- ☐ ₃ 4-5 miles
- ☐ ₄ 6-7 miles
- ☐ ₅ More than 7 miles

42. During the last 12 months, on average, how many times per week did you perform resistance training for personal PT? (i.e., weight lifting using free weights, dumbbells, kettlebells, hammer-strength machines, etc)?

- ☐ ₀ I don't perform resistance training on my own
- ☐ ₁ 1-2 times per week
- ☐ ₂ 3-4 times per week
- ☐ ₃ 5-6 times per week
- ☐ ₄ More than 6 times per week

43. During the last 12 months, on average, how many times per week did you perform sprint or interval-style running for personal PT?

Sprints are defined as short bursts of speed that cannot be sustained for more than a few minutes. **Intervals** are short periods of high speed running mixed with periods of jogging or walking.

- ☐ ₀ I don't perform sprint or interval style running on my own
- ☐ ₁ 1-2 times per week
- ☐ ₂ 3-4 times per week
- ☐ ₃ 5-6 times per week
- ☐ ₄ More than 6 times per week

44. What program is your personal physical training program based upon? (select all that apply)

- ☐ ₀ I don't have a personal physical training program
- ☐ ₁ Traditional Army PT
- ☐ ₂ Cross-training types of exercises
- ☐ ₃ TRX
- ☐ ₄ P90X
- ☐ ₅ Crossfit
- ☐ ₆ Other (please name) _____

45. How would you rate your ability in each of the following categories, compared to others of your age and gender:

	Far Less Than Average ₁	Less Than Average ₂	Average ₃	Greater Than Average ₄	Far Greater Than Average ₅
Endurance	☐	☐	☐	☐	☐
Sprint Speed	☐	☐	☐	☐	☐
Strength	☐	☐	☐	☐	☐
Flexibility	☐	☐	☐	☐	☐
Body Fat*	☐	☐	☐	☐	☐

* For Body Fat "Far Less Than Average" means you have far less body fat than others compared to your age and gender.

46. What was the date of your **last** Army Physical Fitness Test (APFT) (to the best of your recollection)?

/
 MONTH YEAR

47. What were the raw scores on your **last** Army Physical Fitness Test (APFT)?

a. Push-Ups |_|_|_| repetitions

b. Sit-Ups |_|_|_| repetitions

c. Run |_|_| min |_|_| sec

48. What is your height? |_| feet |_|_| inches

49. What is your weight? |_|_|_| lbs

Tobacco Use

Please answer these questions with regard to your past and current tobacco use.

50. Have you smoked more than 100 cigarettes in your life? (100 cigarettes = 5 packs)

O₁ Yes

O₀ No

51. About how old were you when you smoked a whole cigarette for the first time?

O₀ I have never smoked a whole cigarette

O₁ I have smoked a whole cigarette |_|_| Age when first cigarette smoked

52. During the past 30 days, on how many days did you smoke cigarettes?

O₀ I have not smoked in the last 30 days

O₁ I have smoked in the last 30 days |_|_| Number of days smoked

53. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day on average?

O₀ I have not smoked in the last 30 days

O₁ I have smoked in the last 30 days |_|_| Number of cigarettes smoked per day

54. If you used to smoke cigarettes and quit, how many months or years ago did you quit?

O₀ I have never smoked or I am currently smoking

O₁ I have quit smoking |_|_| Months OR |_|_| Years quit

55. If you are currently smoking, how many years have you been smoking?

O₀ I have never smoked or I am currently not smoking

O₁ I am currently smoking |_|_| Number of years smoked

56. During the past 30 days, on how many days did you use smokeless tobacco (chewing tobacco, snuff, dip, etc)?

O₀ I have not used smokeless tobacco in the last 30 days

O₁ I have used smokeless tobacco in the last 30 days |_|_| Number of days used smokeless

57. During the past 30 days, on the days you used smokeless tobacco, how many cans, pouches or plugs did you use per day, on average?

- ☐ I have not used smokeless tobacco in the last 30 days
☐ I have used smokeless tobacco in the last 30 days

____|____| Number of cans **or** ____|____| Number of pouches **or** ____|____| Number of plugs

58. If you used to use smokeless tobacco and quit, how many months or years ago did you quit?

- ☐ I have never used smokeless tobacco or I am currently using smokeless tobacco
☐ I have quit using smokeless tobacco ____|____| Months OR ____|____| Years quit

59. If you are currently using smokeless tobacco, how many years have you been using smokeless tobacco?

- ☐ I have never used smokeless tobacco or I am not currently using smokeless tobacco
☐ I am currently using smokeless tobacco ____|____| Number of years used smokeless

Nutrition

The next questions are about your nutrition and dietary habits. Some of these questions are about meals consumed. Meals are defined as breakfast, lunch and dinner.

60. In general, how healthy is your overall diet? Would you say.....

- ☐ Excellent
☐ Very Good
☐ Good
☐ Fair
☐ Poor

61. How many times per week do you eat breakfast?

- ☐ Never
☐ 1-2 times per week
☐ 3-4 times per week
☐ 5-7 times per week

62. What is typically your largest meal during the day?

- ☐ Breakfast
☐ Lunch
☐ Dinner
☐ All of my meals are typically the same size

63. How many meals per week do you eat at the DFAC?

- ☐ None
☐ 1-3 meals
☐ 4-6 meals
☐ 7-10 meals
☐ more than 10 meals

64. Do you use the nutrition cards/labels in the DFAC to help guide your decisions about the foods you choose?

- ☐ ₁ Always
- ☐ ₂ Sometimes
- ☐ ₃ Never
- ☐ ₄ What labels?

65. During a typical week, how many meals do you get from fast food restaurants?

- ☐ ₀ None
- ☐ ₁ 1-3 meals
- ☐ ₂ 4-6 meals
- ☐ ₃ 7-10 meals
- ☐ ₄ more than 10 meals

66. On an average day, how many cups, cans or bottles of soda do you drink?

- ☐ ₀ None
- ☐ ₁ 1-2 cans, cups or bottles
- ☐ ₂ 3-4 cans, cups or bottles
- ☐ ₃ 5-6 cans, cups or bottles
- ☐ ₄ more than 6 cans, cups or bottles

67. On an average day, how many ounces of water do you drink?

- ☐ ₀ None
- ☐ ₁ 16 ounces or 2 cups
- ☐ ₂ 32 ounces or 4 cups
- ☐ ₃ 64 ounces or 8 cups
- ☐ ₄ 128 ounces or 16 cups
- ☐ ₅ more than 1 gallon

68. On an average day, how many energy drinks do you drink (the size of an 8.3 ounce RedBull® can)? For larger sized cans, estimate how many cans of RedBull® the can would hold (i.e. larger cans may be as many as 3 RedBulls®)

- ☐ ₀ None
- ☐ ₁ 1-2 cans
- ☐ ₂ 3-4 cans
- ☐ ₃ 5-6 cans
- ☐ ₄ more than 6 cans

69. On an average day, how many sports drinks (Gatorade®, Powerade® etc.) do you drink?

- ☐ ₀ None
- ☐ ₁ 1-2 cans, cups or bottles
- ☐ ₂ 3-4 cans, cups or bottles
- ☐ ₃ 5-6 cans, cups or bottles
- ☐ ₄ more than 6 cans, cups or bottles

70. On an average day, how many cups of dark green vegetables (spinach, romaine lettuce, broccoli) do you eat?

- ☐ ₀ None
- ☐ ₁ 1 cup raw or (1/2 cup cooked)
- ☐ ₂ 2 cups raw or (1 cup cooked)
- ☐ ₃ 3 cups raw or (1 ½ cups cooked)
- ☐ ₄ 4 or more cups or (2 cups cooked)

71. Do you make an effort to always eat a meal (or protein/energy bar) within 30 minutes after PT or working out?

- ☐ ₁ Always
- ☐ ₂ Sometimes
- ☐ ₃ Never

72. Do you take dietary supplements? (select all that apply)

Dietary supplements are taken by mouth, contain a dietary ingredient and come in many forms such as tablets, liquids, energy bars, powders and capsules?

- ☐ ₀ None
- ☐ ₁ Multivitamin
- ☐ ₂ Vitamin C
- ☐ ₃ Vitamin D
- ☐ ₄ Calcium
- ☐ ₅ Amino Acid products (such as BCAAs, Arginine, Alanine, etc.)
- ☐ ₆ Protein powder / Isolates
- ☐ ₇ Hydroxycut
- ☐ ₈ Carnitine
- ☐ ₉ Creatine
- ☐ ₁₀ DHEA (Dehydroepiandrosterone)
- ☐ ₁₁ Ginseng
- ☐ ₁₂ Energy Bars
- ☐ ₁₃ Ripped-fuel products
- ☐ ₁₄ Lipo products (Lipo-6, etc.)
- ☐ ₁₅ Nitric Oxide products (NO-Xplode, NOS, etc.)
- ☐ ₁₆ Other _____ (please specify)

Injuries

The next questions are about injuries. People can be injured accidentally or on purpose. Injuries can occur in two ways:

- 1) When strong sudden forces are applied to the body – these would include things like falling from a ladder, an automobile crash, or being hit by a bullet fired from a weapon.**
- 2) When smaller forces are applied to the body over and over again (repeatedly) – these would include activities like excessive exercise or running long distances, repetitive lifting/pulling/pushing objects, or repeatedly pitching a softball.**

73. With these definitions in mind, have you had an injury during the past 12 months? If so, how many different times did you have an injury where any part of your body was hurt, for example, joint sprains, muscle or tendon strains, concussion, cut finger, broken bone, or shin splints?

- ☐ ₀ I have NOT been injured in the last 12 months
- ☐ ₁ I have been injured in the last 12 months

Please enter the number of injuries you have had within the last 12 months:

74. To the best of your memory (*within the past 12 months*), in what month and year did your **most recent** injury happen?

☐ I have not been injured in the last 12 months

____ / ____
MONTH YEAR

75. Within the last 12 months, what type of injury was your **most recent** injury? (***Please check the one most appropriate.***)

- ☐ I have not been injured in the last 12 months
- ☐ Sprain (ligament or joint)
- ☐ Strain (tendon or muscle)
- ☐ Dislocation (joint)
- ☐ Broken/fractured bone
- ☐ Bruise (contusion)
- ☐ Scrape/abrasion
- ☐ Cut/laceration/puncture
- ☐ Loss of body part (amputation)
- ☐ Tendonitis or bursitis
- ☐ Nerve injury
- ☐ Concussion (TBI)
- ☐ Blister
- ☐ Burn
- ☐ Pain
- ☐ Heat or cold injury (heat exhaustion, heat stroke, frostbite, hypothermia)
- ☐ Other _____ (please specify)

76. What part of your body was injured in your **most recent** injury (within the last 12 months)? (***Please check the one most appropriate.***)

- ☐ I have not been injured in the last 12 months
- ☐ Head/face
- ☐ Neck
- ☐ Shoulder
- ☐ Arm (upper or lower)
- ☐ Elbow
- ☐ Wrist
- ☐ Hand/Fingers
- ☐ Chest
- ☐ Upper back
- ☐ Abdominal area
- ☐ Lower back
- ☐ Hip
- ☐ Pelvic area
- ☐ Upper leg (thigh)
- ☐ Knee
- ☐ Lower Leg (Calf/Shin)
- ☐ Ankle
- ☐ Foot
- ☐ Other _____ (please specify)

77. When your most recent injury occurred (within the last 12 months) were you: **(Please check the one most appropriate box.)**

- ☐ ₀ I have not been injured in the last 12 months
- ☐ ₁ Performing military duties or military training (on-duty), but not deployed
- ☐ ₂ Performing military duties or military training (on-duty) while deployed
- ☐ ₃ During leisure activities (off-duty)

78. Was your most recent injury (within the last 12 months) accidental (unintentional) or intentionally caused by someone else? Choose one of the following:

- ☐ ₀ I have not been injured in the last 12 months —→ **STOP Here, you have completed the questionnaire. Please turn in your survey.**
- ☐ ₁ Accidental/unintentional —→ **Continue to Question 79 and 80**
- ☐ ₂ Intentional by someone else, including battle injuries —→ **Skip to question 81**

79. If your most recent injury was accidental (unintentional), what activity were you doing when you were injured? **(Please check the one most appropriate.)**

- ☐ ₁ Riding or driving in or on a motorized vehicle
- ☐ ₂ Walking, hiking, or road marching
- ☐ ₃ Running
- ☐ ₄ Sports _____ (please specify type of sport)
- ☐ ₅ Other Exercise _____ (please specify type of exercise)
- ☐ ₆ Stepping or climbing (stairs, ladder)
- ☐ ₇ Lifting or moving heavy objects
- ☐ ₈ Repairing or maintaining equipment or vehicles
- ☐ ₉ Other _____ (please specify)

80. If your most recent injury was accidental (unintentional), how were you injured? **(Please check the one most appropriate.)**

- ☐ ₁ Fall, jump, trip, or slip
- ☐ ₂ Struck against or struck by an object or person
- ☐ ₃ Cut by a sharp instrument, tool, or object
- ☐ ₄ Overexertion, strenuous, or repetitive movements
- ☐ ₅ Fire, hot substance or object, or steam
- ☐ ₆ Environmental factors such as heat or cold
- ☐ ₇ Breathing or swallowing dust, particles, liquid vapors, or fumes
- ☐ ₈ Other _____ (please specify)

SKIP TO QUESTION 82

81. If someone else intentionally injured you, how did they do it? **(Please pick one answer from either A or B)**

A. Battle Injury (Intentionally injured during combat action while deployed)

- ☐ ₁ Physical assault without a weapon
- ☐ ₂ Physical assault with a weapon (knife, club, etc.)
- ☐ ₃ Blast (i.e., IED, RPG, land mine, grenade)
- ☐ ₄ Gunshot or other high velocity missile
- ☐ ₅ Injury incurred while in battle but not directly caused by the enemy (i.e., falls, slips, strains, sprains)
- ☐ ₆ Other intentional cause _____ (please specify)

B. Non-Battle Injury (not during combat, but intentionally injured in garrison or while deployed)

- ☐ ₁ Physical assault without a weapon
☐ ₂ Physical assault with a weapon or object used as a weapon (knife, club, etc.)
☐ ₃ Gunshot or other high velocity missile
☐ ₄ Other intentional cause _____ (please specify)

82. For your most recent injury (within the last 12 months), did you seek or receive medical care (for example, talked to or saw a medical professional such as a medic, nurse, doctor, physician assistant, athletic trainer, or physical therapist)? (Mark one.)

- ☐ ₁ Yes
☐ ₀ No

83. If yes, you received medical care for your injury, please indicate who provided this medical care (select all that apply)

☐ ₀ I did not receive medical care

	Aide Station or Unit ₁	TMC or MTF ₂	Other Facility ₃
Doctor / Physician	☐	☐	☐
Physician Assistant	☐	☐	☐
Nurse	☐	☐	☐
Athletic Trainer	☐	☐	☐
Physical Therapist	☐	☐	☐
Medic	☐	☐	☐
Other _____	☐	☐	☐

84. For your most recent injury (within the last 12 months), were you hospitalized?

- ☐ ₁ Yes
☐ ₀ No

If YES, please enter the number of days hospitalized:

← (Enter number of days in the boxes, ONE number to a box.)

85. From your most recent injury (within the last 12 months), were you put on profile or limited duty?

- ☐ ₁ Yes
☐ ₀ No

If YES, please enter the number of days were you were on profile or had limited duty:

← (Enter number of days in the boxes, ONE number to a box.)

86. How important were each of the following factors in causing your most recent injury (within the last 12 months)?

a Factor Injury ₃	Major Factor for the Injury ₁	Contributing Factor for the Injury ₂	Not for the
Lack of attention on YOUR part	☐	☐	☐
An error or misjudgment on YOUR part	☐	☐	☐
Lack of attention on SOMEONE ELSE'S part	☐	☐	☐
An error or misjudgment on SOMEONE ELSE's part	☐	☐	☐
Lack of necessary training or skill	☐	☐	☐
Activity or task was too physically or mentally demanding	☐	☐	☐
Equipment problem (wrong equipment, poor design, equipment failure)	☐	☐	☐
Environmental circumstances (wet or slippery surfaces, fog, glare from the sun, etc.)	☐	☐	☐
Alcohol, medication, or drugs	☐	☐	☐
Other _____ (please specify)	☐	☐	☐

Thank you for completing this questionnaire

Appendix D

Follow-up Survey

PRIVACY ACT STATEMENT – HEALTH CARE RECORDS, FITNESS TEST SCORES, AND QUESTIONNAIRE	
1. AUTHORITY FOR COLLECTION OF INFORMATION INCLUDING SOCIAL SECURITY NUMBER Public Law 104-191, Section 1178; Executive Order 9397; Section 8103, Title 5, United States Code	
2. PRINCIPLE PURPOSES FOR WHICH INFORMATION IS INTENDED TO BE USED This form provides you the advice required by the Privacy Act of 1974. The information obtained from this project will be used to determine if cross-training types of physical fitness programs have an effect on injuries, limited duty days, and physical fitness. We will need to obtain your social security number in order to link your questionnaire information with other data such as Army Physical Fitness Test (APFT) scores and information on injuries you may have had in the last year. Using your social security number is the only way we can do this. We will strictly limit access to your social security number by shredding all paper files after scanning, having all computer files password protected, and removing SSNs and name after data are linked. The questionnaire is to obtain information on current physical fitness activities, tobacco use, dietary habits and previous or current injuries.	
3. ROUTINE USES The primary use of this information is to improve the health and fitness of 4 ID Soldiers. The data obtained from the questionnaires will be included in a database that contains the same information for all Soldiers participating in this project. The only personnel having access to this information will be the public health officials who will analyze the information. You will not be personally identified in any report or any output of any type since the interest is in the health and fitness of the Unit and not the health and fitness of any single individual. The database that is established will identify current level of fitness by unit, current unit injury trends, and factors that lower Soldiers' risk of injury and enhance fitness. The database will be used to make recommendations to decision makers regarding programs and policies that might improve fitness and reduce the incidence of injury.	
4. WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION Disclosure of the requested information is voluntary. If you do not disclose the information you will not be included in the database and you will not participate in the project designed to reduce injuries and improve the health and fitness of Soldiers in your Unit.	
SIGNATURE OF PARTICIPANT	DATE

Physical Training and Injury Pre-Deployment Survey

Background Details

Directions: Please carefully read the directions for each section. Be sure to darken bubbles completely. Do not use checks or "x's or special characters" to fill in the bubbles. Please be sure to write legibly where a written answer is required.

Last Name

First Name

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Technical Report No. S.0032423.3-11

1. Today's date:
DAY

|_|_| / |_|_| / |_|_|_|_|
MONTH YEAR

2. Are you...

- O 0 Male
O 1 Female

3. What is your component?

- O 1 Regular Army O 2
Army Reserve O 3
National Guard

4. When did you in-process with this BDE?

|_|_| / |_|_|_|_|
MONTH YEAR

5. What is your current Battalion?

6. What is your company, troop, battery or FSC?

- O 1 A
O 2 B
O 3 C
O 4 D
O 5 E
O 6 F
O 7 G
O 8 HHC or HHB or HHT
O 9 REPL
O 10 REAR D
O 11 Other _____

7. What is your Military Occupational Specialty (MOS)? _____

8. What is your duty MOS while deployed? _____

9. What is your rank?

- ☐ 1 E1 ☐ 2 E2 ☐ 3 E3 ☐ 4 E4 ☐ 5 E5 ☐ 6 E6 ☐ 7 E7 ☐ 8 E8 ☐ 9 E9
- ☐ 10 O1 ☐ 11 O2 ☐ 12 O3 ☐ 13 O4 ☐ 14 O5 ☐ 15 O6
- ☐ 16 W1 ☐ 17 W2 ☐ 18 W3 ☐ 19 W4 ☐ 20 W5

10. Have you been deployed?

- ☐ 0 No
☐ 1 Yes

11. If yes, how many times have you been deployed?

- ☐ 0 I haven't been deployed
☐ 1 1 time
☐ 2 2 times
☐ 3 3 times
☐ 4 4 or more times

12. If yes, where were you deployed? (select all that apply):

- ☐ 0 I haven't been deployed
☐ 1 OEF
☐ 2 OIF/OND
☐ 3 Other _____ (please specify)

Unit Physical Fitness Training (PT)
--

The following questions will ask about unit physical fitness training. Unit physical fitness training is defined as: exercising (i.e., road marching, running, calisthenics, or strength training) with a group of soldiers, such as a squad, platoon, or company.

13. Approximately when did your unit's PT program change and start using exercises from the **Mountain Athlete Warrior (MAW)** fitness program such as speed and agility drills, kettlebells, body weight movements (wall squats, pull-ups, close grip push-ups), core exercises, sled dragging and/or tire flipping.

- ☐ 0 My unit's PT program has not changed
☐ 1 Yes, my unit has adopted MAW exercises/drills

If Yes, when /

Month Year

14. Do you currently participate in unit PT (i.e., road marching, running, calisthenics, or strength training with your unit)?

☐ 1 Yes

☐ 0 No (if no, skip to question 38)

15. On average, how often do you participate in unit PT each week?

☐ 1 Less than 5 times per week

☐ 2 5-7 times per week

☐ 3 8-14 times per week

☐ 4 More than 14 times per week

16. Do you participate in any Army specific alternative PT programs? If yes, which (select all that apply):

☐ 0 I do not participate in any alternative PT programs

☐ 1 Profile PT

☐ 2 Weight Control PT

☐ 3 Pregnancy PT

☐ 4 Other (please name) _____

17. Who **usually** leads your unit's physical training sessions? (select all that apply):

☐ 1 Squad leader ☐ 2 Platoon SGT ☐ 3 Platoon leader

☐ 4 Company 1st SGT ☐ 5 Company Commander ☐ 6 Unspecified Soldier who has attended fitness training

☐ 7 Other (please name) _____

18. In the past 6 months, did your unit perform cross-training type exercise programs? If so, which one (select all that apply):

Cross-training is defined as a program that involves a variety of exercises, such as strength training, agility drills, sprints, plyometrics, etc.

☐ 0 Do not perform cross-training type exercise programs

☐ 1 Basic cross-training types of exercises

☐ 2 TRX

☐ 3 P90X

☐ 4 Crossfit

☐ 5 Other (please name) _____

19. If your unit performed cross-training types of exercise programs in the past 6 months, approximately how many times per week?

☐ 0 Do not perform cross-training type exercise programs

☐ 1 1-2 times per week

☐ 2 3-4 times per week

☐ 3 5-6 times per week

☐ 4 More than 6 times per week

20. During the last 6 months, on average, how many times per week did your unit perform distance running (i.e., running continuously for 1 mile or greater)?

- ☐ 0 Our unit does not perform distance running
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

21. During the last 6 months, on average, how far did you run when your unit performed distance running?

- ☐ 0 I don't perform distance runs with my unit
- ☐ 1 1 mile
- ☐ 2 2-3 miles
- ☐ 3 4-5 miles
- ☐ 4 6-7 miles
- ☐ 5 More than 7 miles

22. During the last 6 months, on average, how many times per week did your unit perform sprint or interval-style running? **Sprints are short bursts of speed that cannot be sustained for more than a few minutes. Intervals are short periods of high speed running mixed with periods of jogging or walking.**

- ☐ 0 Our unit does not perform sprint or interval running
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

23. During the last 6 months, on average, how many times per week did your unit perform calisthenics (i.e., jumping jacks, windmills, mountain climbers, etc.)?

- ☐ 0 Our unit does not perform calisthenics
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

24. During the last 6 months, on average, how many times per week did your unit perform resistance training (i.e., weight lifting using free weights, dumbbells, kettlebells, hammer-strength machines, etc.)?

- ☐ 0 Our unit does not resistance train
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

25. Has your unit's resistance training program changed within the last 6 months?

- ☐ 1 Yes
☐ 0 No

26. Have any of the following exercises been added to your unit's resistance training program within the last 6 months **(select all that apply)**:

- ☐ 0 No new exercises have been added
☐ 1 Kettlebells
☐ 2 Tire Flipping
☐ 3 Sled Dragging
☐ 4 Bands and Chains
☐ 5 Rope Swinging
☐ 6 Other _____

27. During the last 6 months, on average, how many times per week did your unit perform agility drills (i.e., drills requiring lateral movements, typically using cones or ladders, obstacle course, etc.)?

- ☐ 0 Our unit does not perform agility drills
☐ 1 1-2 times per week
☐ 2 3-4 times per week
☐ 3 5-6 times per week
☐ 4 More than 6 times per week

28. During the last 6 months, on average, how often did your unit perform road marches?

- ☐ 0 Our unit does not perform road marches
☐ 1 Less than one time per month
☐ 2 1 time per month
☐ 3 2 times per month
☐ 4 3 times per month
☐ 5 4 times per month or once a week

29. On average, how heavy is the load you carry when your unit performs road marches?

- ☐ 0 Our unit does not perform road marches
☐ 1 Our unit does not carry loads during road marches
☐ 2 0-15 pounds
☐ 3 16-30 pounds
☐ 4 31-50 pounds
☐ 5 51-75 pounds
☐ 6 More than 75 pounds

30. On average, how far does your unit road march at a time?

- ☐ 0 Our unit does not perform road marches
- ☐ 1 1-3 miles
- ☐ 2 4-6 miles
- ☐ 3 7-10 miles
- ☐ 4 11-15 miles
- ☐ 5 More than 15 miles

31. During the last 6 months, on average, how often does your unit run for exercise while wearing body armor?

- ☐ 0 Our unit does not run in body armor
- ☐ 1 Less than one time per month
- ☐ 2 1 times per month
- ☐ 3 2 times per month
- ☐ 4 3 times per month
- ☐ 5 4 times per month or once a week

32. On average, how far does your unit run when wearing body armor?

- ☐ 0 Our unit does not run in body armor
- ☐ 1 1 mile
- ☐ 2 2-3 miles
- ☐ 3 4-5 miles
- ☐ 4 6-7 miles
- ☐ 5 More than 7 miles

33. During the last 6 months, on average, how often does your unit perform physical training in the swimming pool?

- ☐ 0 Our unit does not perform physical training in the swimming pool
- ☐ 1 Less than 1 time per month
- ☐ 2 1-2 times per month
- ☐ 3 3-4 times per month
- ☐ 4 5-6 times per month
- ☐ 5 More than 6 times per month

34. During the last 6 months, how often did your unit specifically train for the APFT (i.e., pushup/sit-ups/2 mile run)?

- ☐ 0 Our unit does not specifically train for the APFT
- ☐ 1 Less than 1 time per month
- ☐ 2 1-2 times per month
- ☐ 3 3-4 times per month
- ☐ 4 5-6 times per month
- ☐ 5 More than 6 times per month

35. What is the rank of the Soldier who develops your unit's physical training calendar?

- ☐ 1 E1 ☐ 2 E2 ☐ 3 E3 ☐ 4 E4 ☐ 5 E5 ☐ 6 E6 ☐ 7 E7 ☐ 8 E8 ☐ 9 E9
- ☐ 10 O1 ☐ 11 O2 ☐ 12 O3 ☐ 13 O4 ☐ 14 O5 ☐ 15 O6
- ☐ 16 W1 ☐ 17 W2 ☐ 18 W3 ☐ 19 W4 ☐ 20 W5

36. Do you lead PT for your squad or platoon?

- ☐ 1 Yes
☐ 0 No

37. If you lead PT for your squad or platoon have you attended a training or certification course on fitness?

- ☐ 2 Do not lead PT
☐ 1 Yes
☐ 0 No

Personal Physical Fitness Training (PT)

The following questions will ask about your personal physical fitness training (PT). Personal PT is any physical fitness training *not* conducted with your unit. Please answer these questions with regard to your *current* personal PT program.

38. Do you perform PT on your own time?

- ☐ 1 Yes
☐ 0 No

39. During the last 6 months, on average, how many times per week did you perform distance running for personal PT (i.e., running continuously for 1 mile or more)?

- ☐ 0 I don't perform distance runs on my own
- ☐ 1 1-2 times per week
☐ 2 3-4 times per week
☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

40. During the last 6 months, on average, how far did you run when you perform distance runs for personal PT?

- ☐ 0 I don't perform distance runs on my own
- ☐ 1 1 mile
☐ 2 2-3 miles
☐ 3 4-5 miles
☐ 4 6-7 miles
☐ 5 More than 7 miles

41. During the last 6 months, on average, how many times per week did you perform resistance training for personal PT? (i.e., weight lifting using free weights, dumbbells, kettlebells, hammer-strength machines, etc)?

- ☐ 0 I don't perform resistance training on my own
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

42. During the last 6 months, on average, how many times per week did you perform sprint or interval-style running for personal PT?

Sprints are defined as short bursts of speed that cannot be sustained for more than a few minutes. Intervals are short periods of high speed running mixed with periods of jogging or walking.

- ☐ 0 I don't perform sprint or interval style running on my own
- ☐ 1 1-2 times per week
- ☐ 2 3-4 times per week
- ☐ 3 5-6 times per week
- ☐ 4 More than 6 times per week

43. What program is your personal physical training program based upon? (select all that apply):

- ☐ 0 I don't have a personal physical training program
- ☐ 1 I don't have a specific personal physical training program
- ☐ 2 Traditional Army PT
- ☐ 3 Cross-training types of exercises
- ☐ 4 TRX
- ☐ 5 P90X
- ☐ 6 Crossfit
- ☐ 7 MAW
- ☐ 8 Other (please name) _____

44. How would you rate your ability in each of the following categories, compared to others of your age and gender:

	Far Less Than Average 1	Less Than Average 2	Average 3	Greater Than Average 4	Far Greater Than Average 5
Endurance	☐	☐	☐	☐	☐
Sprint Speed	☐	☐	☐	☐	☐
Strength	☐	☐	☐	☐	☐
Flexibility	☐	☐	☐	☐	☐
Core Strength	☐	☐	☐	☐	☐
Body Fat*	☐	☐	☐	☐	☐

* For Body Fat "Far Less Than Average" means you have far less body fat than others compared to your age and gender.

45. What was the date of your **last** Army Physical Fitness Test (APFT) (to the best of your recollection)?

|_|_| / |_|_|_|_|
MONTH YEAR

46. What were the raw scores on your **last** Army Physical Fitness Test (APFT)?

a. Push-Ups |_|_|_| repetitions

b. Sit-Ups |_|_|_| repetitions

c. Run |_|_| min |_|_| sec or Walk |_|_| min |_|_| sec

Tobacco Use

Please answer these questions with regard to your past and current tobacco use.

47. Have you smoked more than 100 cigarettes in your life? (100 cigarettes = 5 packs)

- ☐ 1 Yes
☐ 0 No

48. About how old were you when you smoked a whole cigarette for the first time?

- ☐ 0 I have never smoked a whole cigarette
☐ 1 I have smoked a whole cigarette |_|_| Age when first cigarette smoked

49. During the past 30 days, on how many days did you smoke cigarettes?

- ☐ 0 I have not smoked in the last 30 days
☐ 1 I have smoked in the last 30 days |_|_| Number of days smoked

50. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day on average?

- ☐ 0 I have not smoked in the last 30 days
☐ 1 I have smoked in the last 30 days |_|_| Number of cigarettes smoked per day

51. If you used to smoke cigarettes and quit, how many months or years ago did you quit?

- ☐ 0 I have never smoked or I am currently smoking
☐ 1 I have quit smoking |_|_| Months OR |_|_| Years quit

52. If you are currently smoking, how many years have you been smoking?

☐ 0 I have never smoked or I am currently not smoking

☐ 1 I am currently smoking | Number of years smoked

53. During the past 30 days, on how many days did you use smokeless tobacco (chewing tobacco, snuff, dip, etc)?

☐ 0 I have not used smokeless tobacco in the last 30 days

☐ 1 I have used smokeless tobacco in the last 30 days | Number of days used smokeless

54. During the past 30 days, on the days you used smokeless tobacco, how many cans, pouches or plugs did you use per day, on average?

☐ 0 I have not used smokeless tobacco in the last 30 days

☐ 1 I have used smokeless tobacco in the last 30 days

| Number of cans **or** | Number of pouches **or** | Number of plugs

55. If you used to use smokeless tobacco and quit, how many months or years ago did you quit?

☐ 0 I have never used smokeless tobacco or I am currently using smokeless tobacco

☐ 1 I have quit using smokeless tobacco | Months OR | Years quit

56. If you are currently using smokeless tobacco, how many years have you been using smokeless tobacco?

☐ 0 I have never used smokeless tobacco or I am not currently using smokeless tobacco

☐ 1 I am currently using smokeless tobacco | Number of years used smokeless

Nutrition

The next questions are about your nutrition and dietary habits. Some of these questions are about meals consumed. Meals are defined as breakfast, lunch, and dinner.

57. In general, how healthy is your overall diet? Would you say.....

☐ 1 Excellent ☐ 2 Very Good ☐ 3 Good

☐ 4 Fair

☐ 5 Poor

58. How many times per week do you eat breakfast?

☐ 1 Never

☐ 2 1-2 times per week

☐ 3 3-4 times per week

☐ 4 5-7 times per week

59. What is typically your largest meal during the day?

- ☐ 1 Breakfast
- ☐ 2 Lunch
- ☐ 3 Dinner
- ☐ 4 All of my meals are typically the same size

60. How many meals per week do you eat at the DFAC?

- ☐ 1 None
- ☐ 2 1-3 meals
- ☐ 3 4-6 meals
- ☐ 4 7-10 meals
- ☐ 5 more than 10 meals

61. Do you use the nutrition cards/labels in the DFAC to help guide your decisions about the foods you choose?

- ☐ 1 Always
- ☐ 2 Sometimes
- ☐ 3 Never
- ☐ 4 What labels?

62. During a typical week, how many meals do you get from fast food restaurants?

- ☐ 0 None
- ☐ 1 1-3 meals
- ☐ 2 4-6 meals
- ☐ 3 7-10 meals
- ☐ 4 more than 10 meals

63. On an average day, how many cups, cans or bottles of soda do you drink?

- ☐ 0 None
- ☐ 1 1-2 cans, cups or bottles
- ☐ 2 3-4 cans, cups or bottles
- ☐ 3 5-6 cans, cups or bottles
- ☐ 4 more than 6 cans, cups or bottles

64. On an average day, how many ounces of water do you drink?

- ☐ 0 None
- ☐ 1 16 ounces or 2 cups
- ☐ 2 32 ounces or 4 cups
- ☐ 3 64 ounces or 8 cups
- ☐ 4 128 ounces or 16 cups
- ☐ 5 more than 1 gallon

65. On an average day, how many energy drinks do you drink (the size of an 8.3 ounce RedBull[®] can)? For larger sized cans, estimate how many cans of RedBull[®] the can would hold (i.e. larger cans may be as many as 3 RedBulls[®])

- ☐ 0 None
- ☐ 1 1-2 cans
- ☐ 2 3-4 cans
- ☐ 3 5-6 cans
- ☐ 4 more than 6 cans

66. On an average day, how many sports drinks (Gatorade[®], Powerade[®], etc.) do you drink?

- ☐ 0 None
- ☐ 1 1-2 cans, cups or bottles
- ☐ 2 3-4 cans, cups or bottles
- ☐ 3 5-6 cans, cups or bottles
- ☐ 4 more than 6 cans, cups or bottles

67. On an average day, how many cups of dark green vegetables (spinach, romaine lettuce, broccoli) do you eat?

- ☐ 0 None
- ☐ 1 1 or less cup raw or (1/2 cup cooked)
- ☐ 2 2 cups raw or (1 cup cooked)
- ☐ 3 3 cups raw or (1 ½ cups cooked)
- ☐ 4 4 or more cups or (2 or more cups cooked)

68. Do you make an effort to always eat/drink a meal (or protein/energy bar or protein shake) within 30 minutes after PT or working out?

- ☐ 1 Always
- ☐ 2 Sometimes
- ☐ 3 Never

69. Do you have weight goals?

- ☐ 0 No
- ☐ 1 Yes

If YES, select the best description of your goal:

- ☐ 0 Gain weight
- ☐ 1 Maintain weight
- ☐ 2 Lose weight

70. On average, do you consider your weight goals to guide your food choices?

- ☐ 1 Always
- ☐ 2 Sometimes
- ☐ 3 Never

71. Do you take dietary supplements?

(select all that apply):

Dietary supplements are taken by mouth, contain a dietary ingredient and come in many forms such as tablets, liquids, energy bars, powders and capsules

- ☐ 0 Do not take dietary supplements
- ☐ 1 Vitamins/Multivitamin (please specify)

☐ 2 Weight loss supplements (please specify)

☐ 3 Performance/muscle enhancement supplements (please specify)

☐ 4 Nutrition enhancement supplements (please specify)

☐ 5 Other (please specify)

72. What reasons do you take dietary supplements?

(select all that apply):

- | | |
|---|---|
| ☐ 0 Do not take dietary supplements | ☐ 1 Promote general health |
| ☐ 2 Give more energy | ☐ 3 Greater muscle strength |
| ☐ 4 Performance enhancer | ☐ 5 Weight loss |
| ☐ 6 Increased endurance | ☐ 7 Not sure |
| ☐ 8 Other _____ | (please specify) |

Injuries

The next questions are about injuries. People can be injured accidentally or on purpose. Injuries can occur in two ways:

- 1) When strong sudden forces are applied to the body – these would include things like falling from a ladder, an automobile crash, or being hit by a bullet fired from a weapon.
- 2) When smaller forces are applied to the body over and over again (repeatedly) – these would include activities like excessive exercise or running long distances, repetitive lifting/pulling/pushing objects, or repeatedly pitching a softball.

72. With the above definitions in mind, have you had an injury during the past 6 months (August 2011 – present)? If so, how many different times did you have an injury where any part of your body was hurt, for example, joint sprains, muscle or tendon strains, concussion, cut finger, broken bone, or shin splints?

☐ I have NOT been injured in the last 6 months

STOP here, you have completed the questionnaire. Please turn in your survey.

☐ I have been injured in the last 6 months

Please enter the number of injuries you have had within the last 6 months:

|

73. To the best of your memory (*within the past 6 months*), in what month and year did your **most recent** injury happen?

| / | | | | MONTH YEAR

74. Within the last 6 months, what type of injury was your **most recent** injury? (**Please check the one most appropriate.**)

- | | |
|---|--|
| ☐ 1 Sprain (ligament or joint) | ☐ 2 Strain (tendon or muscle) |
| ☐ 3 Dislocation (joint) | ☐ 4 Broken/fractured bone |
| ☐ 5 Bruise (contusion) | ☐ 6 Scrape/abrasion |
| ☐ 7 Cut/laceration/puncture | ☐ 8 Loss of body part (amputation) |
| ☐ 9 Tendonitis or bursitis | ☐ 10 Nerve injury |
| ☐ 11 Concussion (TBI) | ☐ 12 Blister |
| ☐ 13 Burn | ☐ 14 Pain |
| ☐ 15 Heat or cold injury (heat exhaustion, heat stroke, frostbite, hypothermia) | |
| ☐ 16 Other___(please specify) | |

What part of your body was injured in your **most recent** injury (within the last 6 months)? (**Please check the one most appropriate.**)

- | | |
|--------------------------------------|--|
| ☐ 1 Head/face | ☐ 2 Neck |
| ☐ 3 Shoulder | ☐ 4 Arm (upper or lower) |
| ☐ 5 Elbow | ☐ 6 Wrist |
| ☐ 7 Hand/Fingers | ☐ 8 Chest |
| ☐ 9 Upper back | ☐ 10 Abdominal area |
| ☐ 11 Lower back | ☐ 12 Hip |

- ☐ 13 Pelvic area ☐ 14 Upper leg (thigh)
☐ 15 Knee ☐ 16 Lower Leg (Calf/Shin)
☐ 17 Ankle ☐ 18 Foot
☐ 19 Other _____ (please specify)

75. When your most recent injury occurred (within the last 6 months) were you: **(Please check the one most appropriate box.)**

- ☐ 1 Performing military duties or military training (on-duty), but not deployed
☐ 2 Performing military duties or military training (on-duty) while deployed
☐ 3 During leisure activities (off-duty)

76. Was your most recent injury (within the last 6 months) accidental (unintentional) or intentionally caused by someone else? Choose one of the following:

- ☐ 1 Accidental/unintentional **Continue to Question 78 and 79** →
☐ 2 Intentional by someone else, including battle injuries **Skip to question 80** →

77. If your most recent injury was accidental (unintentional), what activity were you doing when you were injured? **(Please check the one most appropriate.)**

- ☐ 1 Riding or driving in or on a motorized vehicle
☐ 2 Walking, hiking, or road marching
☐ 3 Running
☐ 4 Sports _____ (please specify type of sport)
☐ 5 Other Exercise _____ (please specify type of exercise)
☐ 6 Stepping or climbing (stairs, ladder)
☐ 7 Lifting or moving heavy objects
☐ 8 Repairing or maintaining equipment or vehicles
☐ 9 Other _____ (please specify)

78. If your most recent injury was accidental (unintentional), how were you injured? **(Please check the one most appropriate.)**

- ☐ 1 Fall, jump, trip, or slip
☐ 2 Struck against or struck by an object or person
☐ 3 Cut by a sharp instrument, tool, or object
☐ 4 Overexertion, strenuous, or repetitive movements
☐ 5 Fire, hot substance or object, or steam
☐ 6 Environmental factors such as heat or cold
☐ 7 Breathing or swallowing dust, particles, liquid vapors, or fumes
☐ 8 Other _____ (please specify)

SKIP TO QUESTION 81

80. If someone else intentionally injured you, how did they do it? **(Please pick one answer from either A or B)**

A. Battle Injury (Intentionally injured during combat action while deployed)

- ☐ 1 Physical assault without a weapon
☐ 2 Physical assault with a weapon (knife, club, etc.)

Technical Report No. S.0032423.3-11

- ☐ 3 Blast (i.e., IED, RPG, land mine, grenade)
- ☐ 4 Gunshot or other high velocity missile
- ☐ 5 Injury incurred while in battle but not directly caused by the enemy (i.e., falls, slips, strains, sprains)
- ☐ 6 Other intentional cause _____ (please specify)

B. Non-Battle Injury (not during combat, but intentionally injured in garrison or while deployed)

- ☐ 1 Physical assault without a weapon
- ☐ 2 Physical assault with a weapon or object used as a weapon (knife, club, etc.)
- ☐ 3 Gunshot or other high velocity missile
- ☐ 4 Other intentional cause _____ (please specify)

81. For your most recent injury (within the last 6 months), did you seek or receive medical care (for example, talked to or saw a medical professional such as a medic, nurse, doctor, physician assistant, athletic trainer, or physical therapist)? (Mark one.)

- ☐ 1 Yes
- ☐ 0 No

82. If yes, you received medical care for your injury, please indicate who provided this medical care (**select all that apply**): ☐ 0 I did not receive medical care

Aide Station or Unit ¹		TMC or MTF ²	Other Facility ³
Doctor / Physician	☐	☐	☐
Physician Assistant	☐	☐	☐
Nurse	☐	☐	☐
Athletic Trainer	☐	☐	☐
Physical Therapist	☐	☐	☐
Medic	☐	☐	☐
Other _____	☐	☐	☐

83. For your most recent injury (within the last 6 months), were you hospitalized?

- ☐ 1 Yes
- ☐ 0 No

If YES, please enter the number of days hospitalized:

|_|_|_| (Enter number of days in the boxes, ONE number to a box.)



84. From your most recent injury (within the last 6 months), were you put on profile or limited duty?

- ☐ 1 Yes
- ☐ 0 No

If YES, please enter the number of days were you were on profile or had limited duty:

|_|_|_| (Enter number of days in the boxes, ONE number to a box.)



85. How important were each of the following factors in causing your most recent injury (within the last 6 months)?

	Major Factor for the Injury ₁	Contributing Factor for the Injury ₂	Not a Factor for the Injury ₃
Lack of attention on YOUR part	☐	☐	☐
An error or misjudgment on YOUR part	☐	☐	☐
Lack of attention on SOMEONE ELSE'S part	☐	☐	☐
An error or misjudgment on SOMEONE ELSE's part	☐	☐	☐
Lack of necessary training or skill	☐	☐	☐
Activity or task was too physically or mentally demanding	☐	☐	☐
Equipment problem (wrong equipment, poor design, equipment failure)	☐	☐	☐
Environmental circumstances (wet or slippery surfaces, fog, glare from the sun, etc.)	☐	☐	☐
Alcohol, medication, or drugs	☐	☐	☐
Other _____ (please specify)	☐	☐	☐