PROGRAM OUTCOMES AND SOLDIER PERCEPTIONS OF THE ARMY PREGNANCY AND POSTPARTUM PHYSICAL TRAINING (P3T) PROGRAM

by

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DEDICATION

This project is dedicated to military mothers worldwide.

ABSTRACT

PROGRAM OUTCOMES AND SOLDIER PERCEPTIONS OF THE ARMY PREGNANCY AND POSTPARTUM PHYSICAL TRAINING (P3T) PROGRAM

Sarah J. McCreight, M.S., 2014

Thesis directed by: Tracy Sbrocco, Ph.D., Associate Professor, Department of Medical and Clinical Psychology

The Army Pregnancy Postpartum Physical Training (P3T) Program is a mandatory exercise and education program that assists Army Soldiers in preventing excess antepartum weight gain, maintaining fitness during pregnancy, and meeting fitness and body composition standards postpartum. This study examined the relationship between program outcomes and perceptions of command support, program helpfulness, social support, and morale for 305 participants at Fort Campbell, Kentucky. Most participants perceived command support for Soldier participation. However, less than half of participants reported meeting fitness and body composition standards by 180 days postpartum and few believed P3T helped participants meet standards.

Participants endorsed a number of positive social and retention-related program attributes, suggesting that P3T potentially improves confidence and morale, thereby improving retention of highly qualified female Soldiers who also choose to become

parents. This evaluation provides insight into factors that may improve retention of highly qualified Soldiers, as well as considerations for future evaluations.

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CHAPTER 1
Introduction, Background, and Significance

Physical fitness is ingrained in military culture. Fitness programs exist across all service branches under the guidance and supervision of the Department of Defense and are designed to maintain a fit and ready military force at all times (17; 24; 25; 28). Maintaining fitness is also strongly recommended during pregnancy (1; 25; 41; 42; 44). In 2010 alone, nearly 19,000 active duty women (comprising about 9% of the total female force) gave birth, with approximately 15,000 female service members becoming pregnant annually (3; 4; 23). Over the course of five years, about 35% of active duty female service members will become pregnant at least once (15).

A majority of women consider pregnancy and parenthood compatible with a career in the military, and parenthood does not typically affect plans to remain on active duty beyond their current service obligation (12). Women choosing to remain on active duty following a pregnancy must achieve fitness and body composition standards no later than 180 days postpartum (25). These standards include complying with the height and weight standards prescribed to each service member according to sex and age, as well as passing a fitness test that is standardized according to sex and age. One major challenge these women face is balancing healthy weight loss and fitness improvement behaviors with the need to meet these standards soon after giving birth.

The Army has led the way in developing and implementing the Army Pregnancy and Postpartum Physical Training (P3T) Program, a program designed to support women's fitness maintenance and recovery (28; 29; 41; 42). The P3T Program addresses the educational and fitness needs of pregnant and postpartum active duty women with the

goal of maintaining fitness during pregnancy and returning to fitness and body composition standards within the requisite six months following delivery (88).

The Army Public Health Command (APHC) oversees the training, implementation, and evaluation of the P3T Program Army-wide. The APHC evaluation includes a variety of health promotion and risk reduction (HPRR) factors, such as attainment of fitness and body composition standards, delivery type, and term delivery status, which are supported in work-sponsored health promotion programs (38; 54). Previous annual evaluations of the P3T Program have gathered few data, but have shown overall positive outcomes associated with a well-implemented program (87). Specifically, during Fiscal Year 2011 (FY11), 21 structured P3T Programs worldwide responded to data collection efforts by the Army Public Health Command in FY11 (87). Programs responding to the survey overall reported 362 individuals from 34 installations were trained to conduct the P3T Program. They also reported a 73% pass rate for fitness standards and a 76% pass rate for body composition standards by 180 days postpartum, despite overall having only about a 25% attendance rate in both pregnancy and postpartum components (87). Medical outcomes were also positive, as the Cesarean birth rate was 27% as compared to the national average of 32.8%, and preterm deliveries comprised 6% of births in FY11 as compared to the 12.3% national average in the same year (87). Finally, programs responding to the FY11 survey also reported that a total of 210 Soldiers from 14 programs Army-wide were reportedly influenced to remain in the Army as a result of their participation in P3T, suggesting the program provides a form of organizational support (87). Unfortunately, the total number of participants in these 14 programs was not available. However, an approximation (based on 21 programs

surveyed) is that there were about 980 postpartum participants, estimating that more than 21% were influenced to continue service after participating in the P3T Program (87).

It is widely known that organizational and social support can improve morale, productivity, mood, quality of life, and overall health, and it can serve as a buffer against stress (19; 47; 57; 76; 92). Among pregnant and postpartum women, organizational support can improve birth outcomes, reduce risk of developing postpartum depression, reduce longer-term maternal health risks postpartum, and improve maternal confidence in making the role transition to parenthood (53; 56; 61; 62; 81). In military populations, limited research has been conducted on the relationship of pregnancy and the command climate (12; 16; 48; 49; 71).

Specifically, the command climate is likely to be impacted by the perception that a female service member's pregnancy impacts overall unit readiness, despite statistical evidence that pregnancy impacts readiness no more than other medical absence, confinement, or emergency leave (71). This problem is likely due to the conflicting reports of how pregnancy may impact readiness, especially when measured according to deployability at the unit level rather than the whole Army level (16; 71). Military women who plan their pregnancies in times of lower operational tempo (OPTEMPO) are more likely to maintain cohesion within their units and experience greater social support than those who do not (48). Single mothers and mothers whose pregnancies are unplanned or poorly timed, however, may experience a lack of command support during their pregnancies (12; 48). Although command support does not appear to impact intention to remain on active duty (i.e., most women generally plan to continue serving after birth), a

military mother's experience of command support potentially impacts work performance and satisfaction (49).

Many of these studies on pregnancy and command climate provide useful information. However, little is understood about the relationship between health outcomes from an organizational health promotion program for pregnant and postpartum Soldiers and command support. Although command support has been included in previous data collection efforts, the specific role of command support plays in the P3T Program's utilization and outcomes is currently unknown (87).

This project was designed to examine perceived command support from the perspective of Soldiers participating in the P3T Program. Additionally, the project was intended to examine associations between participant perceptions of command support and program effectiveness, program utilization, and meeting fitness and body composition standards six months postpartum.

THE ROLE OF PHYSICAL FITNESS IN MILITARY CULTURE

Physical fitness is a critical component of military readiness, uniformity and professional appearance, and overall health. In general, service members of all branches of the Armed Forces have formal exercise programs to maintain standards of fitness among their personnel (29; 37; 40; 43). These programs are designed to build, train, and maintain physical fitness in a variety of tactical and operational contexts, which support national defense.

All services use bi-annual fitness assessments to test service members on their ability to maintain fitness, which are based on age- and sex-stratified standards (17; 24; 25; 28). These fitness assessments are used not only to measure physical fitness

performance and determine further training needs, but also to determine eligibility for promotion, reenlistment, and ability to attend military courses for professional development (17; 24; 25; 28). Exemptions to these standards are granted on the basis of physical limitations, such as illness or injury. Pregnancy and postpartum recovery were included as exemptions in 1996 (25). However, individuals who are temporarily unable to meet these standards due to injury or pregnancy are required to do so after a specified length of recovery time (25). Following pregnancy, the exemption expires at six months, at which time the service member must successfully pass the fitness test and meet body composition standards.

The two key outcomes of the P3T Program to be assessed in this evaluation are meeting fitness and body composition standards by 180 days after birth. Fitness standards are measured by the successful attainment of a minimum passing score on the Army Physical Fitness Test (APFT). Body composition is assessed according to the regulation governing body composition, which must measure within the range of compliance at six months postpartum (33).

MILITARY WOMEN, PREGNANCY, AND PARENTHOOD

Female members comprise approximately 15% of the Armed Forces (23). Women are now integral components of all active duty missions, working in a variety of occupational specialties from medical support, logistical operations, intelligence, communications, air defense, chemical warfare, and even special operations (55). On January 24, 2013, the Secretary of Defense and the Chairman, Joint Chiefs of Staff eliminated the 1994 Direct Ground Combat Rule that excluded female service members

from serving in combat roles, further expanding the role of women in military service (11).

Historically, women serving on active duty were discharged on confirmation of pregnancy, but this practice ended with the beginning of the All-Volunteer Force in 1972 (24; 27; 31; 32; 41; 42). While pregnancy-related discharges still occur, the pendulum has swung in the other direction. Pregnant service members are only separated from service if it is in their own best interest, as well as in the best interest of their branch of service (26). There is substantial investment in the training of individuals serving in the military. Therefore, only under extenuating circumstances (e.g., inability to provide care for a child while serving in the military as a single parent) is retention not preferred (26). Thus, it is in the best interest of the military to provide support to service members during and after pregnancy. This support should focus on minimizing excessive antepartum weight gain; maintaining muscle strength during pregnancy; minimizing adverse birth outcomes; maximizing soldier fitness; and providing moral support, education, and links to supportive services throughout the pregnancy and postpartum period. All of these factors are encompassed by the P3T Program mission (89).

SUCCESS RATES IN MEETING STANDARDS PRIOR TO P3T IMPLEMENTATION

Historically, the Army provided no exception to the standards of care offered by all military services with regard to fitness in pregnant and postpartum Soldiers. In 1993, the Army exempted pregnant Soldiers from unit physical training activities and in 1996, extended the postpartum return to fitness standards from 135 to 180 days (six months), but the burden to achieve standards was solely on the service member (35; 78). Previous studies suggest that women struggled to meet these standards without support (84; 91;

93). In one small study, for example, only 19% of women scored equal or better on their postpartum APFT than they did on their last pre-pregnancy APFT (93). Additionally, this study found that only 31% of women were able to match their pre-pregnancy APFT scores by one year postpartum. This is not an unusual finding, as a study of pregnant athletes and other physically active women showed that most of these women do not achieve pre-pregnancy fitness levels until one to two years postpartum (60). A three-year study by the U. S. Army Research Institute of Environmental Medicine concluded that Army women who attempted to achieve military fitness and body composition standards on their own were more likely to fail postpartum fitness assessments, have higher body fat percentage, have higher incidents of illness and injury, and other poor health and fitness outcomes (91). A pilot study of a fitness program for pregnant and postpartum Soldiers at Fort Benning, GA showed that, while women overall performed worse on the first postpartum diagnostic APFT, performance improved on subsequent diagnostic tests with a trend toward pre-pregnancy performance (84).

Proper education on mitigating excess weight gain during pregnancy and effective weight management postpartum was also lacking before the implementation of the P3T Program. As a result of the requirements to meet physical fitness and body composition standards within six months postpartum, military women may be at risk for engaging in unhealthy practices to achieve their weight loss goals. Previous studies show that service members experience stress or anxiety regarding "making weight" tend to engage in the use of laxatives, dietary supplements promoting weight loss, vomiting, and diuretics prior to weigh-ins (18; 50; 79). The stakes are high for these women, as failure to achieve physical fitness and body composition standards can adversely impact career progression,

promotions, and receipt of any favorable administrative actions (30; 36). For example, if a new mother became eligible for promotion to the rank of Staff Sergeant (E-6), she must appear before a promotion selection board. Mandatory attire to appear before the board is the service dress uniform (usually a tailored, form-fitting skirt or slacks and blazer), and physical appearance in uniform is included among the considerations for promotion selection (36). Thus, providing education and resources to these women for healthy weight maintenance during pregnancy and healthy weight loss postpartum is highly beneficial.

MAINTAINING FITNESS THROUGH EXERCISE IN PREGNANCY AND POSTPARTUM

Maintaining physical fitness during pregnancy may help military women to return to the fitness standards required of them to remain on active duty. Research has consistently shown that antenatal exercise is associated with benefits to the fetus, healthy birth outcomes, healthy postpartum weight loss, and reduction in depressive symptoms postpartum (7; 8; 21; 63; 73; 80).

Consistent with evidence-based guidelines for exercise and pregnancy, all branches of military service recommend or require continued physical activity throughout pregnancy and the postpartum period as directed by medical advice (1; 25; 41; 42; 44). However, only the Army has developed a formal method to implement a safe and structured fitness program. Among other services, there is little or no formal guidance, accountability, or standardization, nor is there a community of support for the service member (28; 29; 41; 42). For example, Navy guidelines require their pregnant service women to conduct individualized exercise regimens (approved by health care providers) based on the recommendations of the American College of Obstetricians and

Gynecologists (ACOG), but no guidance is given regarding accountability or safety measures (42). Air Force guidance suggests pregnant personnel seek guidance from their unit's fitness organizer and her primary care provider and conduct continued training on her own during pregnancy and postpartum (29). Both service branches effectively place the burden of developing and maintaining a safe and effective fitness plan on the pregnant service member, and both indicate an individual workout plan that separates the service member from her unit. These limitations are noteworthy, as the second-most cited requirement among competitive athletes to overcome barriers to resume training postpartum was having a team with which to train (10).

Though only a temporary "loss," the cost of losing one-tenth of women from the active duty work force each year to pregnancy-related complications, childbirth, and convalescent leave is potentially burdensome to the Army's resources (3). The Army recognized the need for a program such as the P3T Program to assist in maintaining fitness levels among pregnant Soldiers and helping them return to duty as quickly as possible because of the large role women play in Army leadership, mission support, and training. Providing as much support as possible to these leaders so that they may successfully and expeditiously return to serving in their full capacity is in the best interest of all parties.

Evaluation of how the P3T Program benefits participating Soldiers is a necessary component of the implementation of such a program. The purpose of this evaluation includes assessing not only how likely participants are to meet necessary fitness and body composition standards, but also the participants' perceptions of command support,

morale, social support, and program effectiveness in helping military professionals to meet these standards.

THE ROLE OF ORGANIZATIONAL SUPPORT IN TRANSITION TO PARENTHOOD

Making the role transition from military professional to military parent is uniquely challenging. In the institutional model, which best-describes the military, the collective good of the service surpasses the needs of the individuals (2). Military mothers must balance the demands of their dual-roles as military professionals and caregivers in the context of deployments, reassignments, permanent changes of station (military relocation), shift-work, and a host of other competing interests. A variety of factors relevant to organizational or institutional support can impact how well the new military mother manages this role transition.

Among women who recently gave birth to their first child, social support with low levels of stress is predictive of lower incidence of postpartum depression at 8 weeks postpartum (20). The specific components of social support with the strongest predictive value identified in this study of primiparous (first-pregnancy) working women were "reliable alliance" (a consistent source of social support) and affiliation and integration in a working group, and reassurance of worth or value in the work environment (20). One key contributor to this reassurance of worth includes ongoing recognition of the mother's competence at work during and after pregnancy, which can impact job satisfaction (20). Maternal job satisfaction could potentially impact retention if a military mother was ambivalent about her desire to remain on active duty after birth.

The effects of organizational support extend to the health of intimate partner relationships as well. A family-supportive work environment was found to moderate the

communications and interactions between intimate partners, such that these interactions are less likely to be aggressive in nature in a supportive work environment (17). The military is unique, as compared to most occupations, because it creates a military community, an entity that serves as a de facto extended family. Indeed, there are sub-communities within the larger military communities in which members are surrounded by similar others on the basis of their service branch, career field, unit of assignment, or even, as in the case of the P3T Program, health status.

This evaluation attends to one aspect of support, that is, participants' perception of command support of the P3T Program. Command support is essential to the operation of the P3T Program and can impact how well the program is run, whether implementation is maintained with fidelity to program guidance, and whether Soldiers participate as required in this mandatory program (88). Historically, command support as evaluated from the perspective of program leaders was rated in the low-moderate range (87). However, participant perception of command support, though collected, was not included in previous analyses (87). Participants who believe the program is well-supported by their command may directly impact Solders' commitment to the program and overall success in meeting fitness and body composition outcomes. Therefore, this project also evaluates the relationship between perceived command support and service members' utilization of the program, as well as the relationship between command support and fitness and body composition outcomes.

THE DEVELOPMENT OF THE P3T PROGRAM

The Department of the Army standardized a fitness program for pregnant and postpartum women to better prepare Soldiers for birth and for returning to full duty as

required (88). By relying on expert opinions and empirical evidence to support antepartum and postpartum fitness, the P3T Program aims to help Army mothers achieve fitness and weight management goals. After pilot studies were conducted at Fort Benning, Georgia, Fort Carson, Colorado, and Fort Bragg, North Carolina, the P3T Program was implemented Army-wide in 2008 (34; 52; 67; 78; 84).

As previously noted, a three-year study at Fort Lewis showed postpartum Army Soldiers were at higher risk for fitness and body composition failure and were at greater risk of injury (91). Lombardi and colleagues found that intervention with a wellness program improved birth outcomes, specifically with regard to increased gestational age and birth weight, reduced Cesarean delivery, and reduced labor duration (67). An additional pilot intervention at Fort Carson found that women who participated in the pilot intervention at least 50% of the time were significantly more likely to pass their APFT postpartum than participants who attended less frequently (78). Finally, a pilot study conducted at Fort Benning showed statistically significant differences between pre-pregnancy fitness scores and first postpartum diagnostic APFT six to eight weeks postpartum. This study also showed a statistically significant improvement in fitness scores from first diagnostic test to second diagnostic test (12-16 weeks postpartum), with a trend toward reaching pre-pregnancy scores (84). While not all pilot programs reported significant findings with regard to fitness and body composition outcomes as compared to non-participants, all studies recommended continuing a similar program for the educational, social, and psychological benefits perceived to be associated with the program (52; 67; 78; 84; 91).

P3T Operations and Evaluation

The Army P3T program utilizes the experience of local military medical professionals and trains fitness leaders at the local level to maintain program operations. It remains the only service-sponsored fitness program aimed at supporting pregnant and postpartum service members in maintaining and rebuilding fitness and body composition. The P3T Program has three major components to achieve the goals of the program: pregnancy, at-home, and postpartum (88). During the pregnancy component, all pregnant Soldiers attend physical training (PT) four days per week and one day of education. During the at-home component, all puerperium (> 6 weeks postpartum) women conduct strength training exercises during their convalescent leave to increase their readiness to return to postpartum PT. Finally, during the postpartum component, women participate in ongoing strength and endurance training and diagnostic assessments from six weeks to six months after delivery to prepare for their record APFT. Attendance is required from early pregnancy through the final postpartum fitness test (88). As a potential added benefit, the program may provide much-needed social support for pregnant Soldiers and camaraderie during what can be a stressful and challenging time for a female service member.

The P3T Program provides the necessary support and structured training environment for service members to achieve weight and fitness goals throughout pregnancy and into the postpartum period. Furthermore, this program is standardized and overseen by locally-trained military leaders, who guide pregnant and postpartum Soldiers in appropriate exercise techniques and monitor the women for safety (85; 86). The P3T Program's local military leaders are typically junior Officers and Noncommissioned

Officers (NCOs) who operate the P3T Program as an additional duty (88). Usually, junior NCOs are trained to become the instructor-trainers and exercise leaders, while medical experts and Education Coordinators are typically Officer positions (88). The program places significant demands on units to provide sufficient personnel to operate the program, which burdens program leaders with implementation fidelity and impacts installation resources. Therefore, the support of local unit leaders is essential to maintaining the P3T Program. Commanders are expected to ensure sufficient access to facilities and equipment, training for P3T leaders, and accountability of participants who fail to attend this mandatory program.

Since full-scale implementation of the P3T Program, the Army Public Health Command (APHC) has utilized an exit survey for participants to gather participant feedback on the program as a whole (90). Survey items include attendance rates, birth and fitness outcomes, estimates of perceived command support, and other information. The APHC attempts to utilize the data collected from participant exit surveys at each installation to assess utilization, morale, and health and fitness outcomes of participants, among other program goals. Historically, the data collected has largely been insufficient to fully analyze all aspects of the P3T Program. However, one aspect of program operations that has consistently been identified among surveys from participants and P3T leaders in previous years was insufficient command support (87). Specifically, P3T participants and leaders at several installations Army-wide reported that they disagreed with statements that commanders supported the P3T Program (87). Inconsistent or insufficient command support potentially plays a role in promoting the P3T Program because command policy letters and local command structure are necessary to implement

the program at the local level (88). Further, commanders are ultimately responsible for the training and fitness of all of their Soldiers (35; 37). Failing to prioritize the P3T Program could potentially exclude a specific subset of commanders' subordinates whose fitness needs must be met. Therefore, examining the role of command support in the context of the P3T Program on Soldier fitness and body composition outcomes is of key interest.

SPECIFIC AIMS

This project utilized existing APHC P3T Program outcome survey data from program participants at one select location (Fort Campbell, KY) to evaluate the relationship between command support, program utilization, perceptions of program success, and the key health and fitness outcomes as measured by the APFT and body composition standards. Data from the Individual Soldier Survey completed at Fort Campbell, KY for FY12 were used.

Specific Aim One

The first aim of the project was to examine whether P3T participants perceived their command supported the P3T Program. Level of perceived support was also examined in relationship to self-reported fitness and body composition outcomes. It was hypothesized that high perceived command support would be positively associated with successful attainment of fitness and body composition requirements.

Specific Aim Two

The second aim of the project was to examine whether P3T participants perceived the P3T Program to facilitate their return to Army standards of fitness and body

composition. Level of perceived helpfulness was also examined in relationship to self-reported fitness and body composition outcomes. It was hypothesized that high perceived program helpfulness would be positively associated with successful attainment of fitness and body composition requirements.

Specific Aim Three

The third aim of the project was to examine the level of utilization of the P3T Program among participants. Level of program utilization was also examined in relationship to self-reported fitness and body composition outcomes. It was hypothesized that high program utilization would be positively associated with successful attainment of fitness and body composition requirements.

CHAPTER 2
Methods

PARTICIPANTS

The study enrollment period included pregnancy, the At-Home P3T Program during convalescence, and the postpartum period up to 180 days (six months) after delivery. During FY12, 278 pregnant women and 186 postpartum women were enrolled (n = 464) in the P3T Program at Fort Campbell, Kentucky, according to the report of a parallel survey of the P3T Program Leaders. However, not all of these women would have completed the P3T Program during the data collection period. For example, some pregnant women enrolled in P3T did not deliver their babies until the following fiscal year and were not included in this survey.

Therefore, 305 active duty women enrolled in the P3T Program who completed the program and were disenrolled during FY12 participated through completion of the ISS at disenrollment. These participants were included as part of a larger program evaluation of the P3T Program at all Army installations with an active program. The participants completed the ISS as part of standard disenrollment procedures from the mandatory P3T Program approximately 180 days postpartum.

MEASURES

The Individual Soldier Survey (ISS)

The ISS (see Appendix A) is an 18-item, web-based survey that is located on the P3T Program's Army Knowledge Online web portal. It takes approximately 15-30 minutes to complete online. The ISS was designed by the APHC as part of ongoing evaluation of the P3T Program. The APHC's goal was to capture specific health

promotion/risk reduction metrics, including implementation methods and health outcomes. Items on this survey include basic information about participants' success in achieving the required standards (passing both APFT and body composition requirements), as well as Soldiers' perceptions of how beneficial the P3T Program was in helping the Soldier achieve these goals. The reliability and validity of this measure has not been evaluated. For the purpose of this study, specific items were analyzed to address the following domains; command support, program utilization, health and fitness, and beliefs about the program's effectiveness.

Command Support. To assess command support, participants were directly asked to rate the following question on a five point Likert-type scale anchored by 1 (*Strongly agree*) and 5 (*Strongly disagree*): *Your chain of command was very supportive of your participation in P3T*.

Program Utilization. A single item on the ISS was used to assess Soldiers' use of the P3T Program during three periods: pregnancy, postpartum convalescent time (up to 6 weeks after birth), and postpartum (6 weeks through 6 months after birth). Soldiers were given the option to select their level of participation from the following items: *Pregnancy (stopped before delivery)*, *Pregnancy (all the way up to delivery)*, *Postpartum (at-home program during convalescent leave)*, *Postpartum (stopped prior to 6 months after delivery)*, and *Postpartum (through full 6 months after delivery*). Participants were able to select all responses that applied to them for this item.

Responses on this item were coded into four mutually-exclusive groups (high utilization, pregnancy, postpartum, and low utilization). For example, women who participated during pregnancy and the postpartum period were categorized differently

from women who participated only during pregnancy. These responses were recoded to facilitate data analysis.

Soldier Health and Fitness Outcomes. Participating Soldiers were asked about both their health outcomes and their fitness and body composition outcomes. For health outcomes, participants were asked about the type of delivery they had (vaginal, Caesarean, full-term, pre-term, miscarriage, delivery with complications, and delivery without complications). Participants were able to select all responses that applied. Regarding fitness and body composition outcomes, participating Soldiers were asked when they met body composition standards and when they met fitness standards. Both of these items were scored using the following options: *Not Applicable*, *Before the required date*, *By the required date*, *After the required date*, and *I didn't meet the standards*. The "Not Applicable" response was included to capture those participants who planned to separate from military service, as these participants were not required to meet standards.

For the purpose of analysis, fitness and body composition outcomes were recoded into dichotomous variables. These outcomes were categorized on the basis of whether standards were met by the 180-day requirement. Participants who indicated they met fitness and body composition standards either before or by 180 days were recoded as passing. Participants who indicated they met standards after the deadline, did not meet standards, or selected "Not Applicable" were recoded as failing.

Soldier Beliefs about the P3T Program. Participating Soldiers were asked about their beliefs regarding the helpfulness of the P3T Program in meeting positive health outcomes and achieving fitness and body composition standards. Regarding health outcomes, participants were asked about whether participation in P3T reduced

discomforts associated with pregnancy (e.g., nausea, fatigue, swelling of feet and hands, etc.). Participants selected one of the following: *P3T helped these discomforts significantly*, *P3T sometimes helped these discomforts*, *I'm not sure if P3T helped or not*, or *I don't think P3T helped at all*. Participants were also asked about the influence the P3T Program had on their improved morale (either from the support of P3T Leadership, or from the camaraderie of peers in the P3T Program), confidence in their abilities to be a parent and Soldier, confidence in their abilities to meet the challenges of motherhood, and whether they believed the P3T Program helped them to meet fitness and body composition standards. Finally, a single item asked participants about their perception of the competence of trained Exercise Leaders. This item was scored on a five point Likert-type scale anchored by 1 (*Very well trained*) and 5 (*Very lacking in training/competence*).

STUDY DESIGN

This project used a quantitative descriptive survey design. The data analyzed were archival, having been collected by the Army Public Health Command for its annual program evaluation.

PROCEDURE

ISS Administration

Soldiers participating in the P3T Program completed a brief survey upon disenrollment from the program. Disenrollment occurs at or near 180 days' postpartum, or upon passing a record Army Physical Fitness Test and body composition evaluation, whichever occurs first. P3T Program leaders electronically accessed the ISS via Common Access Card, and then administered the survey to participants. These surveys were conducted on a continual basis as each Soldier completed her requirements with the P3T

Program. Data collection for FY12 occurred from October 1, 2011 through March 1, 2013. The extra time beyond the conclusion of the fiscal year was included to capture all women who participated in the P3T Program during FY12, including those who may have been pregnant during FY12 and who delivered during FY13. We received 305 valid surveys from Soldiers who participated in the P3T Program in FY12.

ANALYTIC STRATEGY

The independent variables were command support, program utilization, and perceived helpfulness of the program. The dependent variables were fitness pass/fail (as measured by the Army Physical Fitness Test) and body composition pass/fail. Since the surveys did not capture demographic data and were not linked to objective data collection tools (e.g., fitness test records or medical records), inferential statistics could not be used to make predictions about the larger population of Army women enrolled in P3T. Rather, descriptive statistics were used to summarize survey responses. Responses are described in terms of frequency, mean, and standard deviation.

The surveys were designed by the APHC for program evaluation purposes in accordance with the Army Health Promotion regulation (38). The questions asked on the survey are based on the aspects of the P3T Program that the APHC intended to evaluate. No measures of internal consistency, construct validity, or other research-based characteristics of survey development were used in survey development. Therefore, the study was limited to what was available and other factors of interest were not examined.

The data for fitness and body composition outcomes are categorical (i.e., described as meeting standards early, on time, late, or never). Therefore, logistic regression was used to evaluate factors associated with the fitness and body composition

outcome variables. Categorical outcome data were recoded into dichotomous variables (e.g., pass or fail). To examine whether perceived command support and program utilization were associated with fitness and body composition outcomes, data were analyzed using a binary logistic regression for each pass-fail outcome. A binary logistic regression analysis was conducted to determine the impact of attendance, command support, and perceived helpfulness of P3T to meet fitness goals as measured by the APFT. A binary logistic regression analysis was conducted to determine the impact of attendance, command support, and perceived helpfulness of P3T to meet body composition goals.

Without the benefit of temporal sequence, predictions cannot be made from the data collected. Consequently, associations between command support, program utilization, beliefs about the effectiveness of the P3T Program, and fitness and body composition outcomes were identified, while causal relationships between these variables were not.

CHAPTER 3
Results

DEMOGRAPHICS

Given that the ISS collected no demographic data (e.g., race or ethnic group, age, parity, rank, or marital status), demographic data from the Armed Forces Health Surveillance Center (AFHSC) were used as an estimate. From 2001-2010, AFHSC reported 156,314 pregnancies among military women that resulted in live births (4). There were 18,375 deliveries across the active duty service branches of the U.S. Armed Forces in 2012 alone (6). During the ten-year span from 2001-2010, over half of all births (51.8%) were to military women ages 18-24, and the overwhelming majority (87.8%) of births were to Enlisted women (4). Consistent with overall military demographics, the greatest number of live births were among Caucasian, Non-Hispanic women (47.6%), with 29.1% of live births among African American, Non-Hispanic women, and 23.3% among other racial/ethnic groups (4; 23). Unfortunately, the "other" category is not further differentiated. The highest number of births at 52,840 (33.8%) occurred among women in the Army, the largest service branch (4; 23).

OUTCOMES

Birth Outcomes

Participants were asked to select all birth outcome options that applied, and responses were then categorized based on the combination of multiple-choice options selected on this item. Respondents were able to select whether their births were vaginal or cesarean; whether the pregnancy was full term, preterm, or resulted in miscarriage; and whether their delivery was with or without complications. In most cases, this question was not answered completely and, consequently, meaningful interpretation of the

responses cannot be made. For example, while 60.3% (n = 184) of respondents reported a vaginal delivery and 21.0% (n = 64) reported cesarean birth, 18.7% (n = 57) did not select either option. While more than a quarter of respondents (n = 80, 26.2%) reported delivery at full term, 62.6% (n = 191) made no selection of full term, preterm, or miscarriage. More than two-thirds (n = 209, 68.5%) did not report on whether their delivery was with or without complications, and 10.5% (n = 32) did not respond to any part of this item.

We attempted to supplement our incomplete study findings regarding pregnancy outcome with data from the AFHSC. Findings from the AFHSC data from 2001-2010 showed that uncomplicated delivery comprised 24% of all deliveries, which include both vaginal and cesarean deliveries (5). Complications during pregnancy and delivery resulted in 1.16 million patient encounters, despite most (52%) complications impacting fewer than 0.5 percent of all pregnancies (5). However, nearly all pregnancies are included because the definition of "complications" is so broad (5). There are 262 different four-digit diagnostic codes that comprise complications of pregnancy, based on ICD-9 codes 640.0-679.1 (5). Select diagnoses are included in Table 1. Many diagnostic codes do not reflect the nature of the complication, and the top three ranking medical encounters were "Other current conditions complicating pregnancy," "Other specified complications of pregnancy," and "Other threatened labor," respectively (5). Of note, "Normal delivery" ranked fourth (5).

Table 1. Select Pregnancy Complications and Delivery Types, 2001-2010.

Clinical Diagnosis (Diagnostic Code)	*n*	%
Normal delivery (650)	36,537	23.4%
Other current conditions complicating pregnancy (648.9)	59,858	38.3%
Threatened premature labor (644.0)	26,211	16.8%
Post-term pregnancy (645.1)	27,937	17.9%
Abnormal glucose tolerance (648.8)	11,468	7.3%

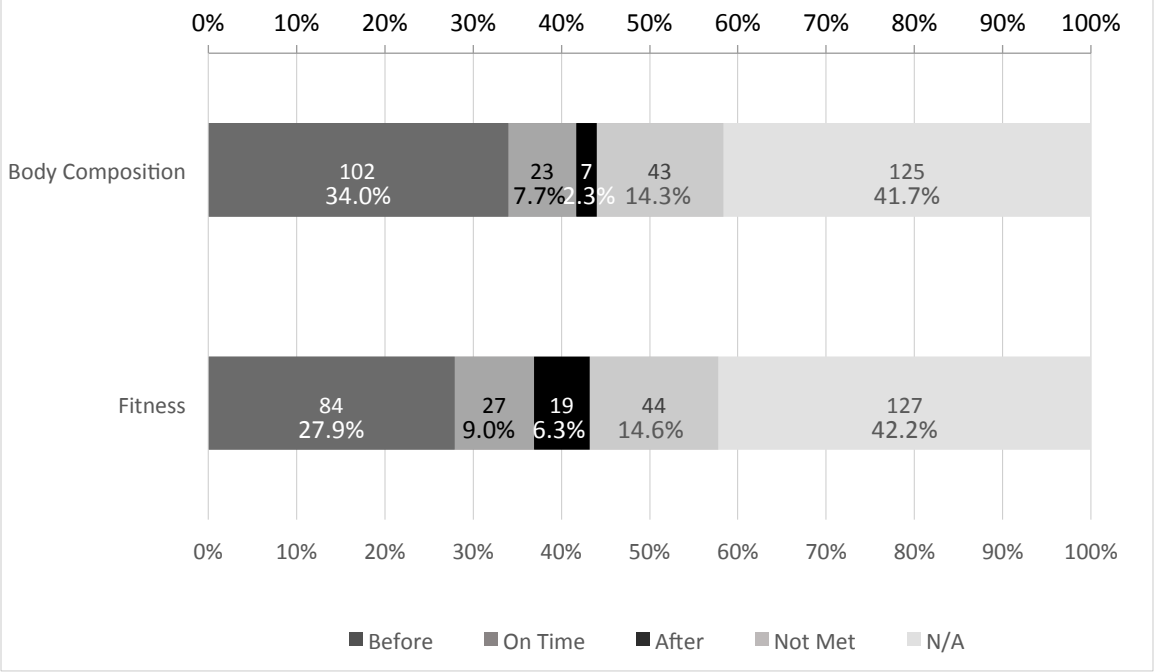
Note. Information adapted from AFHSC Medical Surveillance Monthly Report, Vol. 18, No. 12 (5). Normal Delivery includes both uncomplicated Cesarean and uncomplicated vaginal deliveries. Categories are not mutually exclusive.

Fitness and Body Composition Outcomes

Participants reported body composition and fitness standards attainment (as measured by the APFT) based on the 6 month (180 day) requirement. Specifically, they were asked if they met the standards before, at or after 180 days postpartum, if those standards were not met, or if attaining the standards did not apply. Of note, 30 participants (9.8%) responded that they intended to take a Chapter 8 (pregnancy) discharge from military service.

Less than half of the participants reported meeting fitness standards (n = 111, 36.9%) and body composition standards (n = 125, 41.7%) before or at 180 days postpartum. Self-reported results are displayed in Figure 1. Data are presented for individuals reporting when they met body composition standards and fitness standards separately. From left to right, individuals reported meeting standards before the 180-day deadline, at 180 days ("On Time"), after the deadline, that they did not meet standards, or "Not Applicable."

Figure 1. Self-Reported Fitness and Body Composition Standards Attainment



Note. *Before* = Standards met before 6 months postpartum, *On Time* = Standards met by 6 months postpartum, *After* = Standards met after 6 months postpartum, *Not Met* = Standards were not met, *N/A* = Not Applicable.

PROGRAM UTILIZATION

Participants were encouraged to engage in the P3T program for the duration of their pregnancy, at home during convalescence, and postpartum recovery up to 180 days. Participants were categorized based on their program utilization. High Utilization (n = 72, 24.1%) included women who participated fully in both the pregnancy and postpartum components of the P3T Program. Pregnancy Utilization (n = 76, 25.4%) includes women who participated during all of pregnancy but either dropped out early of the postpartum component or did not participate in postpartum P3T at all. Postpartum Utilization (n = 48, 16.1%) includes women who participated during all of the postpartum component of the P3T Program but who either did not participate during pregnancy or who dropped out from the pregnancy component prior to delivery. Finally, Low Utilization (n = 101, 33.8%) includes women who did not complete any portion of the P3T Program (e.g.,

participated in P3T only during a portion of the pregnancy before dropping out and did not participate in the postpartum component). Five participants produced invalid responses and one participant reported only at-home program use; these six individuals were not included in the analysis. The recoded data are summarized in Table 2.

Table 2. P3T Program Utilization by Pregnant and Postpartum Participants.

Enrollment and Participation	*N*	%
High Utilization	72	23.6%
Pregnancy Utilization	76	24.9%
Postpartum Utilization	48	16.0%
Low Utilization	101	33.1%
Excluded	6	2.0%
Missing	2	0.7%

Note. High Utilization = denotes participation in all of the pregnancy and postpartum periods; Pregnancy Utilization = denotes participation for the duration of pregnancy but limited or no participation during postpartum; Postpartum Utilization = denotes limited or no participation during pregnancy but full participation during the postpartum period; Low Utilization = denotes any participation that does not continue to the end of pregnancy or to disenrollment; Excluded = participation responses were invalid or utilization of the At-Home program only.

SOLDIER PERCEPTIONS OF COMMAND SUPPORT FOR THE P3T PROGRAM AND FOR PROGRAM HELPFULNESS

Among respondents, most (n = 241, 79%) agreed or strongly agreed that their command supported attendance in the P3T Program. Regarding leader competence, eighty percent (n = 244) of participants reported belief that exercise leaders were at least adequately trained.

Participants were asked to check all the ways the P3T Program benefitted them from a list that included obtaining help to meet fitness and body composition standards. More than one quarter, 28.5% (n = 87) of respondents, reported the P3T Program helped them to meet body composition standards. With regard to perceived support in reaching

fitness goals, 35.4% (n = 108) of respondents indicated they believed that they received help in meeting fitness standards.

Participants were also asked whether they believed the P3T Program helped to reduce discomforts of pregnancy. Most of the respondents (n = 177, 58.0%) reported participation helped reduce discomforts of pregnancy, at least some of the time. Specifically, 83 women (27.2%) reported that P3T significantly helped reduce pregnancy-related discomforts, and 94 women (30.8%) reported that participation sometimes helped reduce discomforts of pregnancy.

Other views about P3T Program benefits included beliefs about the program's influence on parental confidence and beliefs that morale was improved by the program. These benefits were also included in the list of benefits that participating Soldiers could check as applicable. Approximately one-third of participants responded that they felt better able to meet the challenges of parenthood because of P3T (n = 106, 34.8%), while 41.3% (n = 126) indicated that P3T increased their confidence in being a Soldier Mom. Ninety-two participants (30.2%) reported that P3T helped them to better manage the psychological impacts of pregnancy and parenthood. Most (n = 183, 60.0%) believed they gained helpful pregnancy and parenting-related knowledge and skills through their participation in the P3T Program. Regarding morale benefits, perceived support from program leadership improved morale for 91 (29.8%) participants, while program peer support improved morale for 86 (28.2%) participants.

Relationship of Command Support to Fitness and Body Composition Outcomes

Program utilization, perceptions of command support, and fitness and body composition outcomes were not normally distributed. Perceptions of program helpfulness

in meeting fitness and body composition standards and interactions between command support and attendance levels were also examined. A total of 285 of the original 305 cases were included in these analyses due to missing data. The results of these analyses are presented separately for fitness standards and body composition standards.

Fitness Standards

The logistic regression model, with added interaction terms between command support and program utilization, failed to converge due to low frequencies in some categories. In this instance, no participants met criteria for low perceived command support x high utilization x APFT passed at six months. However, the regression model without interaction terms fit the data significantly better than a model with the constant alone ($\chi^2(8) = 94.95, p < .001$). The influence of command support on fitness outcomes was not significantly associated with passing the APFT when assessed as a dichotomous (yes/no) variable (OR = 1.92; 95% Confidence Interval [CI], 0.86, 4.25; $p = .11$). When command support was analyzed by the degree to which participants agreed that their command supported their participation, ranging from "strongly disagree" to "strongly agree," there was also no significant association between command support and fitness outcomes.

The strongest association with achieving fitness standards was the belief that the P3T Program provided help in participants' passing the APFT (OR = 12.03; 95% CI, 6.26, 23.11; $p < .001$). Women who perceived P3T as helpful in meeting fitness standards were more than 12 times more likely to report meeting those standards by six months postpartum as compared to women who reported that they did not receive help in meeting fitness standards. Additionally, women who participated for the duration of their

pregnancy had significantly greater odds of passing their APFT to meet fitness standards than low utilizers of the program (OR = 3.61; 95% CI, 1.64, 7.94; $p < .01$). Table 3 displays the odds ratios and confidence intervals for the association of utilization (high, pregnancy, postpartum, or low), belief in the P3T Program's effectiveness, and perceived command support with fitness outcomes.

Table 3. Factors Associated with Meeting Fitness Standards Six Months Postpartum (n = 285).

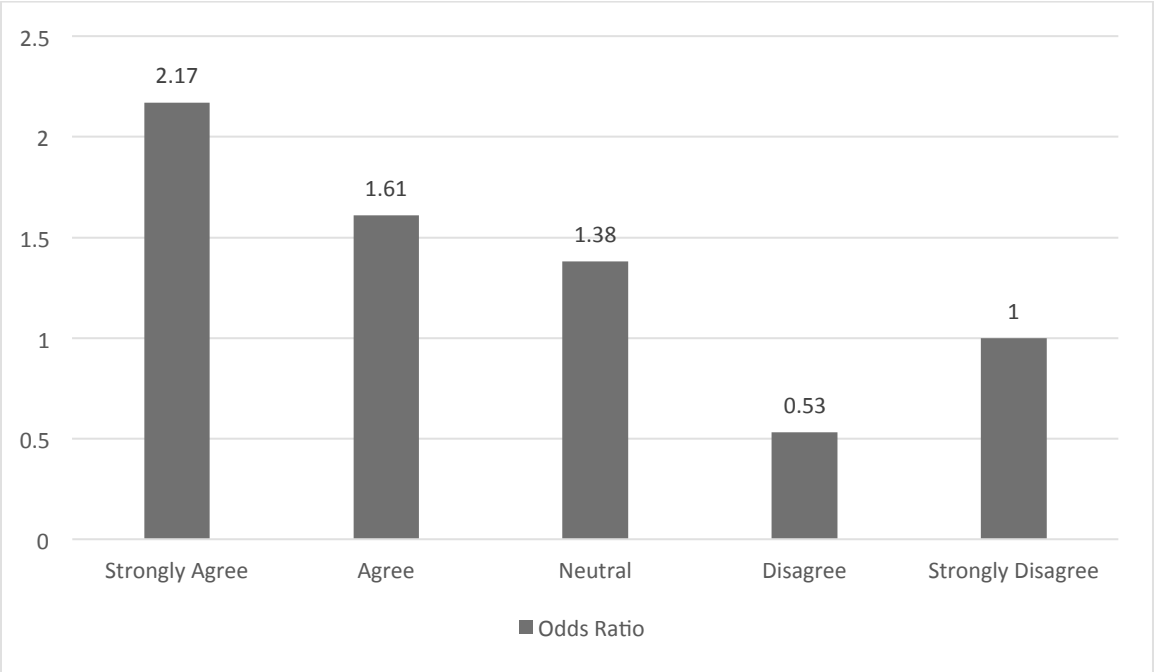
		95% CI for Odds Ratio	
Variable	Odds Ratio	Lower	Upper
Utilization			
High Utilization	1.00	0.44	2.28
Pregnancy Utilization	3.61**	1.64	7.94
Postpartum Utilization	2.36	0.96	5.82
Low Utilization	1.00	—	—
P3T helps meet fitness standards	12.03***	6.26	23.11
Command Supports Participation			
Strongly Agree	2.17	0.34	13.71
Agree	1.61	0.24	10.76
Neutral	1.38	0.18	10.61
Disagree	0.53	0.05	5.43
Strongly Disagree	1.00	—	—

Note. R^2 = .34 (Hosmer & Lemeshow), .28 (Cox & Snell), .39 (Nagelkerke). Model $\chi^2(8) = 94.95$, $p < .001$.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Despite the lack of significant association of command support with fitness outcomes, the degree to which participants agreed with the statement that their command supported participation in P3T is associated with outcomes. While there was no significant difference between groups of participants based on the degree to which they perceived command support, the overall trend on the basis of perceived command

support approached significance. Specifically, the odds of passing fitness standards by six months postpartum were higher among participants who indicated stronger agreement with the statement that their command supported participation in the P3T Program (OR = 0.75; 95% CI, 0.56, 1.01; p = .06). These findings are depicted in Figure 2.

Figure 2. Trend of Perceived Command Support with Odds of Meeting Fitness Standards.



Note. Odds ratios calculated using "strongly disagree" as comparison category. Significant trend of lower perceived command support with lower odds of meeting standards by six months postpartum.

Body Composition Standards

The overall logistic regression model without interactions fit the data significantly better than a model with the constant alone ($\chi^2(8) = 53.49, p < .001$). The interaction of command support as a dichotomous (yes/no) construct and participation was not significant ($\chi^2(3) = 0.28, p = .964$). Command support overall was significantly associated with body composition outcomes when assessed as a dichotomous variable. Women who reported "good" command support (i.e., either agreed or strongly agreed with the statement that their command supported participation in P3T) were more than

twice as likely to meet body composition standards by six months postpartum compared women who did not report good command support (OR = 2.12; 95% CI, 1.07, 4.19; $p <$ .05). However, when command support was analyzed by the degree to which participants agreed that their command supported their participation, ranging from "strongly disagree" to "strongly agree," there was no significant association between command support and body composition outcomes. The strongest association with achieving body composition standards were the belief that the P3T Program was helpful in meeting body composition standards (OR = 4.20; 95% CI, 2.30, 7.67; $p < .001$), participation throughout pregnancy (OR = 3.74; 95% CI, 1.84, 7.60; $p < .001$), participation throughout the postpartum period (OR = 3.24; 95% CI, 1.47, 7.16; $p < .01$), and participation throughout all of pregnancy and postpartum (OR = 2.73; 95% CI, 1.34, 5.57; $p < .01$). Women who reported that they received help in meeting body composition standards were more than four times as likely to meet those standards within six months postpartum as women who did not perceive P3T as helpful in meeting standards. Additionally, completers of any part of the P3T Program had significantly greater odds of passing the body composition standards compared to participants who dropped out or otherwise were low utilizers. Table 4 displays the odds ratios and confidence intervals for the association of utilization (high, pregnancy, postpartum, or low), belief in the P3T Program's effectiveness, and perceived command support with body composition outcomes.

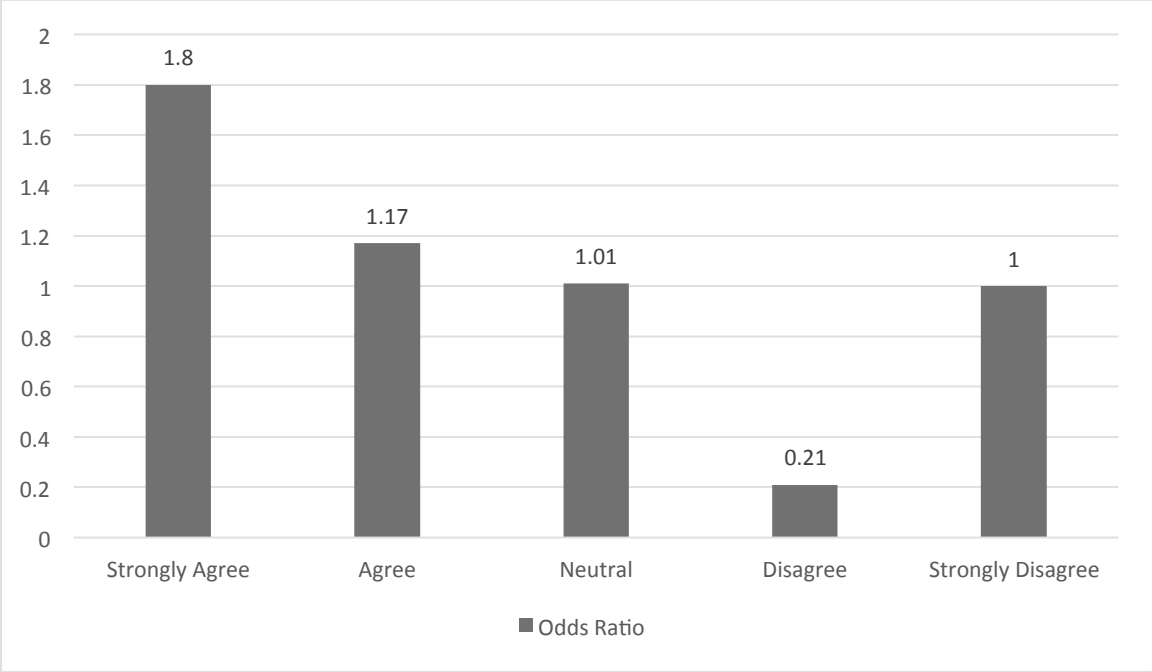
Table 4. Factors Associated with Meeting Body Composition Standards Six Months Postpartum (n = 285).

Variable	Odds Ratio	95% CI for Odds Ratio	
		Lower	Upper
Utilization			
High Utilization	2.73**	1.34	5.57
Pregnancy Utilization	3.74***	1.84	7.60
Postpartum Utilization	3.24**	1.47	7.16
Low Utilization	1.00	—	—
P3T helps meet body composition standards	4.20***	2.30	7.67
Command Supports Participation			
Strongly Agree	1.80	0.38	8.69
Agree	1.17	0.23	5.91
Neutral	1.01	0.18	5.60
Disagree	0.21	0.02	1.94
Strongly Disagree	1.00	—	—

Note. R^2 = .16 (Hosmer & Lemeshow), .17 (Cox & Snell), .23 (Nagelkerke). Model $\chi^2(8) = 53.49$, $p < .001$.
* $p < .05$, ** $p < .01$, *** $p < .001$.

While there was no significant difference between groups of participants based on the degree to which they perceived command support, there was a significant overall trend on the basis of perceived command support. Specifically, the odds of passing body composition standards were significantly higher among participants who indicated stronger agreement with the statement that their command supported participation in the P3T Program (OR = 0.70; 95% CI, 0.54, 0.92; $p < .05$). These findings are depicted in Figure 3.

Figure 3. Trend of Perceived Command Support with Odds of Meeting Body Composition Standards.



Note. Odds ratios calculated using "strongly disagree" as comparison category. Analyses revealed a significant trend of lower perceived command support with lower odds of meeting standards by six months postpartum.

CHAPTER 4
Discussion

The Department of Defense (DoD) has made gender diversity a high priority and has ensured that there are policies and programs in place that promote the lives of military women and their families. The P3T Program, initiated Army-wide in 2004, is one such program. Developed and overseen by the APHC, this mandatory program seeks to provide education and physical training support to Army women, ensuring they are prepared to meet fitness and body composition standards and that they are prepared for parenthood as "Soldier Moms." The purpose of this study was to evaluate the impact of perceptions of command support and program effectiveness in assisting participants to meet fitness and body composition standards.

COMMAND SUPPORT AND PROGRAM QUALITY

Relationship of Command Support to Outcomes

The vast majority, almost 80 percent of participants, reported the program had command support and that exercise trainers were well trained. While command support was not significantly associated with outcomes for fitness, the high level of perceived support resulted in a skewed distribution that may distort the ability to gauge the influence of command support and program quality on fitness outcomes.

Greater variability in participant reporting (i.e., including those from other sites with lower general perceived command support) may yield a clearer picture of this association. Furthermore, it is important to note that the degree to which participants agreed with the statement that their command supported participation in P3T did yield significant findings. Therefore, command support for participating in the P3T Program

may be considered necessary for P3T participation, but insufficient to predict fitness and body composition outcomes among participants. Unfortunately, there are no published data on the association of command support in a military setting on fitness or body composition outcomes with which to compare these findings.

Relationship of Perceived Program Helpfulness to Outcomes

Though most participants perceived P3T leaders to be adequately trained to conduct the P3T Program, overall perceptions of whether participants obtained help to meet fitness and health outcome goals were low. Fitness and body composition outcomes were more strongly associated with perception of receiving help to meet fitness and body composition standards than with command support. Temporal sequence of these factors was not obtained in the original data. It is therefore unclear whether perception of the program's helpfulness predicted outcomes, vice versa, or were the result of another variable. While the association is strong, it is possible that individuals who did not successfully meet standards were more likely to make a *post hoc* evaluation that the program was not helpful. Conversely, those who were able to successfully meet fitness and body composition standards may have been more likely to rate the program as helpful.

Relationship of Program Utilization to Outcomes

High program utilization was not significantly associated with meeting fitness standards, though it was significantly associated with meeting body composition standards. It is possible that individuals who attended more regularly were able to have weight loss benefits associated with regular exercise during pregnancy and postpartum. For example, women who exercise during pregnancy are more likely to exercise

postpartum, thus reducing overall weight gain and postpartum weight retention (45). Even low-intensity exercise during pregnancy has been shown to reduce overall chronic disease risk associated with weight and cardiovascular health (22). However, exercise-limiting conditions, delivery of multiples (e.g., twins or triplets), and the degree of effort put in by these mothers in later pregnancy or postpartum all may have impacted the fitness benefits attained by these participants (51; 69; 70; 74; 83; 94). The beliefs of pregnant women about the safety of exercise during their pregnancies could also affect the frequency and intensity of exercise, particularly later in the pregnancy when exercise feels more effortful due to increased body weight and fetal growth (46; 72; 82).

Other Factors Impacting Reported Outcomes

Participant report of health outcomes was limited with regard to type of delivery, whether full term or preterm, and whether with or without complications. We attempted to supplement this limited data with AFHSC data collected over a ten year period (5). However, additional limitations arose when using these data. It is important to note that the multiple conditions complicating pregnancy and delivery as reported in the AFHSC data could have been encountered by a single pregnancy (5). Additionally, the medical encounters documented as complications may not necessarily be perceived as such by the mother. For example, previous Cesarean delivery accounted for 9.0% of pregnancy-related complications; however, if the subsequent pregnancy was going well, the mother may not perceive this as a complication and therefore may not report it as such on the ISS (5).

Very few participants reported failing to meet fitness and body composition standards. However, a substantial number responded “Not Applicable” to both items. The

field “Not Applicable” was intended to capture those women who chose to leave the Army and therefore were not required to meet fitness and body composition standards. The number of women who selected “Not Applicable” was disproportionately larger than the number of women who indicated they planned to request a pregnancy-related discharge. Reporting that one has failed to meet fitness and body composition standards may be a source of shame for some participants, particularly given the prevalence of weight-related stigma in Western culture and in the military (13; 68; 75). Nearly half of active duty women who are obese are significantly more likely to experience depressive symptoms than their normal weight counterparts (64). Women who gain excess weight in pregnancy and/or do not lose sufficient weight by six months postpartum are significantly more likely to be obese eight to ten years later (77). Thus, selecting “I did not meet standards” may have been difficult for those experiencing a high level of shame about their performance. It is possible that many of the individuals reporting “Not Applicable” with regard to fitness and body composition goal attainment in fact had not successfully met those goals.

One unanticipated finding was that nearly 10% of participants reported intentions to separate from military service. This finding, though not part of the aims, is higher than previous research has shown (59). Despite some rates of active duty separations reaching as high as 20% for junior enlisted women and as high as 24% for junior Officers, overall separations (across all reasons) was only 11% in FY11 (59). While 6% of active duty women across all branches left service for “parenthood” reasons, only 5% of active duty women separated from service for reason of “pregnancy” (59). Furthermore, pregnancy and parenthood is not the most significant influence on retention. Of all groups surveyed

in the military retention study conducted by ICF International in 2012, the groups that separated from military service in the highest numbers were married and single women without children (59). Retention is one of the goals of the P3T Program, and the finding that nearly twice as many women intended to separate from active duty service than in the previous fiscal year is a point of interest for the Army.

LIMITATIONS

Since data collection was limited to a single installation with historically high-quality performance, we inadvertently limited the range of variability in the response pool. Fort Campbell, Kentucky has consistently performed well in previous surveys, and it was believed that data collected from this site would be more robust (87). While valuable information was obtained regarding the quality program implemented and maintained at this site, the resulting positively-skewed distribution limited our ability to assess for associations between perceived command support and outcomes.

The survey was designed to collect data on the health and fitness outcomes of participants were intended for evaluating the P3T Program based on APHC demands. Because P3T is a public health initiative, the APHC solicited information about the outcomes relevant to the goals of the P3T Program. Therefore, the importance of obtaining individualized information is less relevant to the overall goal of APHC than obtaining public health relevant information. However, some improvements to the survey items may have benefitted APHC in getting the most accurate reports from participants about their outcomes.

For example, clearly stated operational definitions of key variables to be collected would likely have improved response rates on questions about birth outcomes.

Participating Soldiers appeared to only partially complete the item regarding birth outcomes, or they omitted it altogether. This response pattern may have been due to poor understanding by respondents that they could have had a term pregnancy with delivery complications and cesarean birth, and that these fields were not mutually exclusive. Likewise, clarification of the appropriate selection of "Not Applicable" for fitness and body composition outcomes may have reduced participants' tendency to select that response. One possible solution to these problems is to conduct focus groups and field testing of survey items to ensure respondents understand the questions and how to appropriately respond. The original ISS was not developed through this more stringent method of survey design.

Demographic information was not collected for the anonymous ISS. Therefore, we are limited in being able to compare differing beliefs about command support on the basis of race, rank, parity, career field, or a variety of other indicators. Furthermore, we cannot draw any conclusions about specific groups who may be more or less likely to participate in the P3T Program, who have better fitness and body composition outcomes, or who perceive that the program is of benefit to them. However, other utilization studies and Army personnel information show that most eligible participants are likely to be first-time mothers in the ranks of Private through Specialist (39; 65; 67; 78; 84; 91). Additionally, women who are more likely to participate in exercise during pregnancy are women who were more physically active prior to conception, with higher education and income, who are Caucasian, and who have no other children in the home (51). Thus, the expectation is that Caucasian women in their first pregnancy, with historically higher

performance on their pre-pregnancy APFT, and who are more educated would be more likely to participate in the P3T Program.

Program utilization for the duration of pregnancy and postpartum were lower than might be expected for the P3T Program, given the general mandate to participate, the program's purported benefits, and high level of encouragement from command (65). There were no items on the survey to address reasons why pregnant and postpartum Soldiers did not participate regularly in the P3T Program. Possible reasons may include health concerns that preclude Soldiers from exercising during pregnancy or postpartum, high operational tempo in the unit, preferences to work out alone, beliefs that the Soldier has better awareness of her own fitness needs, or a variety of other reasons.

Overall, only two participants (0.7%) were missing from responses on program utilization. However, utilization data may not have accurately captured the truest picture of participation in the Fort Campbell, Kentucky P3T Program. It is possible that responding participants may have entered the P3T Program after delivering their babies (thus, never participating in the pregnant component of P3T), or transferred to another duty station or discharged from the Army before meeting disenrollment criteria during the postpartum component of the P3T Program. Indeed, 56 respondents participated in the postpartum program only (that is, they did not report participating in P3T during their pregnancy). The survey did not collect information about whether these individuals had participated in P3T previously, or at other locations in the Army.

The ISS collected valuable information about perceived command support, P3T Program utilization, fitness and body composition outcomes, and health promotion/risk reduction metrics such as birth outcomes. While some of these factors were shown to be

strongly correlated in this study, other unknown factors that strongly influence these outcomes could not be measured using the ISS. Further, to be able to make predictions about fitness and body composition outcomes, temporal sequence is necessary. For example, it is unable to be determined whether belief in the P3T Program's effectiveness is what led to successful goal attainment, or if women who failed to meet goals then decided the program was not effective.

Areas of Future Study

Areas of future study should focus on expanding the evaluation to more sites, particularly those with less favorable participant views on command support. While the data collected was robust enough to provide meaningful information about the P3T Program, most participants perceived a high level of command support. Expansion to other sites may allow for increased variability in participant perceptions of command support. The increased variability of participant responses with regard to perceived command support would enable future researchers to evaluate associations between perceived command support and fitness and body composition outcomes, program utilization, and other variables.

The positive findings regarding social support and morale are essential to evaluate further, particularly with regard to the Army's goal of retaining highly qualified professionals in the service. Most participants reported gaining important knowledge and skills on parenting, and more than one-third indicated they felt better able to meet the challenges of parenthood as a result of their participation in P3T. Many also reported improved confidence in adapting to the role as a Soldier Mom, improved ability to cope with the psychological impacts of pregnancy and parenthood, and improved morale

through leader support and through peer support. Future studies should consider evaluating the impacts of these variables on outcomes and retention.

As the Army transitions to an altered delivery method for the education component of the P3T Program (i.e., to web-based learning), it is essential to keep the positive social support and morale components a priority. The transition to web-based learning does provide the valuable opportunity to educate women on mitigating excess antepartum weight gain earlier in pregnancy, rather than relying on the cyclic pregnancy education classes given to groups of pregnant women across trimesters. Pregnant Soldiers need to know that they are not "eating for two" as soon as possible in their pregnancy, to help combat the excess weight gain. Given the trend toward more overweight and obese women becoming pregnant on active duty, this early education may be more helpful in reducing or leveling that trend (58).

As a general public health initiative, it is important to assess the impact of race on weight retention. Future evaluations of the P3T Program or other weight and fitness management programs for pregnant women should consider race differences in postpartum weight retention. In general, African American women are more likely to retain approximately 6.4 pounds more than their White counterparts (14). Excess weight gain and/or failure to lose by 6 months postpartum can potentially lead to long-term obesity (77). Again, the trend toward increased overweight and obese mothers in the military also plays a role here. According to Department of Defense records, pregnancies complicated by obesity have risen nearly three-fold in only the span of five years (5). Additional consideration of other health factors (e.g., diabetes, hypertension) or

mitigating health behaviors (e.g., type of diet or food intake) that may affect outcomes should also be investigated in future studies.

Survey delivery for this study was through a mandatory disenrollment process, in which a P3T Leader opens the web form for the participant to complete. Alternate delivery methods may be useful to explore in future studies. Maintaining the survey as a component of disenrollment will likely allow for higher response rates and a better view of how the P3T Program is operating at each site. However, current implementation requires that a P3T Leader access the survey for participants, which may promote demand characteristic response patterns that skew results more positively. Furthermore, the Army Public Health Command may not retain oversight of all installation programs in the future. It will be important to evaluate alternative delivery methods of the survey to retain this valuable information. One recommendation is to explore periodic assessments to reduce the potential hindsight bias of a single time point in the postpartum period. As previously mentioned, a limitation of this study was that the single time point of data collection may have unduly influenced participants' perceptions of the usefulness of the P3T Program in meeting goals. Future studies should consider evaluating perceptions of program helpfulness prior to final fitness and body composition evaluation, to avoid skewing results on the basis of whether or not standards were achieved.

Future studies on this topic may also wish to address other factors besides command support that may play a larger role in weight retention and fitness in this population. Weight stigma and the stringent regulations under which military personnel must perform potentially influence their eating habits and weight loss behaviors. For example, in a study of active duty military women and eating behavior, over one-third

were found to be at-risk for disordered eating, and 8% were diagnosed with an eating disorder (66). The demands of maintaining weight and appropriate fitness are increased after giving birth, and the short timeline to accomplish weight loss goals potentially increase the risks of restrained or disordered eating habits.

While it seems intuitive that the P3T Program is a valuable asset to pregnant and postpartum service women in the Army, it is also important to consider what is missing from the P3T Program. This survey collected information from program participants of varying participation levels. However, an estimated 25-35% of women who were eligible to participate in the P3T Program were not enrolled and therefore not surveyed (65; 87). A framework of self-efficacy and subsequent health behaviors may help to determine how women who are and who are not enrolled in P3T successfully meet fitness and body composition standards (9). Further, a mixed methods analysis of qualitative and quantitative data from both participants and non-participants in the P3T Program would help provide additional information about the needs Soldiers experience during this transition to parenthood, which remain unfilled.

CONCLUSIONS

The findings of this study suggest that the ISS items need to be refined to capture all necessary data to draw conclusions about participants, the P3T Program, and outcomes. Indeed, the Army Public Health Command has taken steps to refine data collection tools to enhance the utility of information gathered. Furthermore, additional questions were raised about the impact of command support on the P3T Program during the course of this evaluation. The finding that command support was generally perceived as high among these participants, while their outcomes remained low, was surprising

given the documented history of this well-established P3T Program. This finding suggests that command support is not sufficient to influence fitness and body composition outcomes. We found a significant trend that, as perceptions of command support increase, the odds of passing fitness and body composition standards also increase. This trend suggests that command support is important to outcomes, but other unknown factors are likely to be of greater influence.

Another interesting finding was that participants generally did not believe the P3T Program was beneficial in their efforts to meet fitness and body composition goals. One possible explanation of this finding may have been related to when the survey was delivered. Because the survey was delivered after the final fitness and body composition measures were completed, is possible that perceptions of the helpfulness of the program were skewed by hindsight bias. Despite the strong association between perceived program helpfulness and outcomes, it is unclear whether individuals who did not successfully meet standards were more likely to make a *post hoc* evaluation that the program was not helpful. Conversely, those who were able to successfully meet fitness and body composition standards may have been more likely to rate the program as helpful. An alternative possibility is that the timing of the survey is appropriate because it is more likely to accurately capture true outcomes. Additionally, other factors about the individuals that were not evaluated in this survey are potentially more salient with regard to who did and did not successfully meet standards. Therefore, the association of perceived program helpfulness and outcomes may be misleading.

The results of the ISS did suggest that participants believed their exercise trainers were adequately trained to lead the P3T Program, and many participants endorsed

improved morale, social support (both from peers and leaders), and other psychological benefits of participation in the P3T Program. Many participants also reported experiencing increased self-confidence in their abilities to manage the changing lifestyle of becoming a parent while maintaining a career in the Army. While it is possible that these responses were biased based on demand characteristics or social desirability to respond more positively, it is important to consider the implications of these responses. Given the differences in retention of highly qualified female Officers and enlisted Soldiers as compared to their male counterparts, these aspects of the P3T Program are potentially very beneficial in increasing retention of females who become parents. While values about caregiving would not likely change, the P3T Program could potentially support those women who struggle to decide whether to remain on active duty on the basis of their ability to meet the demands of balancing a career and parenthood. Improving morale, building confidence, and supporting retention are as important to the overall wellbeing of these Soldier Moms as their physical fitness and body composition, and it is important to highlight these benefits as well.

The P3T Program is a fitness and education program designed to meet the unique needs of Army women during their pregnancy and postpartum. The aims of the program are not only to reduce overall weight gain, maintain and improve fitness, and educate Soldier Moms on various aspects of their pregnancies and transition to parenthood. The program also aims to promote improved wellbeing of these women, so that they perform optimally in their roles as parents and as Soldiers. The Department of Defense is committed to providing equal opportunities for its female service members and civilian employees. Current Department of Defense policies reflect this commitment through the

development of programs supporting all members of the Armed Forces in a variety of ways. The Army's P3T Program is one of these programs. The P3T Program provides the opportunity for Soldier Moms to learn and grow as parents as well as service members, and serves as a role model for other military branches, federal agencies, and the nation at large.

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Appendix A
Individual Soldier Survey

ARMY PREGNANCY POSTPARTUM PHYSICAL TRAINING PROGRAM

INDIVIDUAL SOLDIER EVALUATION SURVEY

The US Army Public Health Command (Provisional) serves as the subject matter expert organization in support of the Army Pregnancy Postpartum Physical Training (PPPT) Program. As a participant, you play a vital role in the evaluation of the Army PPPT Program. Your input will help us to assess how well this program is meeting participant needs and also assess program impact.

Please complete and submit answers to ALL the questions. Timeframe to be reported on is for the period in which you participated in a PPPT Program.

Thank you in advance for completing the survey. If you have questions, please send an email to Course Director

18 Questions

1. When did you participate in the PPPT Program? (check all that apply)

- ☐ Pregnancy (stopped before delivery)
- ☐ Pregnancy (all the way up to delivery))
- ☐ Postpartum (at-home program during convalescent leave)
- ☐ Postpartum (stopped prior to 6 months after delivery)
- ☐ Postpartum (through full 6 months after delivery)

2. How did you learn about the PPPT Program? (check all that apply)

- ☐ Commander
- ☐ Health care provider
- ☐ PPPT Instructor Trainer or Exercise Leader
- ☐ BN Medic
- ☐ PPPT website
- ☐ Other pregnant or postpartum Soldiers

3. Do you think that participation in PPPT helped reduce your pregnancy discomforts (i.e., nausea, fatigue, swelling of feet and hands, back pain, leg cramps, heartburn, constipation, headaches)? (select one answer)

- ○ PPPT helped these discomforts significantly.
- ○ PPPT sometimes helped these discomforts.
- ○ I'm not sure if PPPT helped or not.
- ○ I don't think PPPT helped at all.

4. Participation in the PPPT Program influenced or benefited you in the following ways. (check all that apply)

- [ ] I decided NOT to take a Chapter 8.
- [ ] I decided to take a Chapter 8.
- [ ] I chose to re-enlist or remain in the Army.
- [ ] I gained confidence in my ability to be a parent and a Soldier.
- [ ] I had improved morale from the support and positive reinforcement provided by the PPPT leadership.
- [ ] I had improved morale from the camaraderie and social support provided by other PPPT participants.
- [ ] I felt more able to meet the challenges of motherhood.
- [ ] I felt more able to handle the psychological impacts of pregnancy and postpartum.
- [ ] I gained helpful pregnancy and parenting related knowledge and skills from the education classes.
- [ ] I obtained help to meet the AR 600-9 ht/wt standards.
- [ ] I obtained help to meet the APFT standards.

5. Which of the following describes your delivery (check all that apply)

- [ ] Vaginal delivery
- [ ] Cesarean delivery
- [ ] Pre-term delivery
- [ ] Full-term delivery
- [ ] Miscarriage
- [ ] Delivery with complications
- [ ] Delivery without complications

6. When did you meet the AR 600-9 ht/wt standards?

- ○ Not applicable
- ○ Before the required date
- ○ By the required date
- ○ After the required date
- ○ I didn't meet the AR 600-9 standards

7. When did you meet the APFT standards?

- ○ Not applicable

- ○ Before the required date
- ○ By the required date
- ○ After the required date
- ○ I didn't meet the APFT standards

8. **Check the classes you did NOT find beneficial. (check all that apply)**

- ☐ Birth Control Options Postpartum
- ☐ Breastfeeding: Getting Started
- ☐ Breastfeeding: Mom on the Move
- ☐ Budget and Career Planning
- ☐ Fetal Development
- ☐ Infant Oral Health Care
- ☐ Infant Safety
- ☐ Infant Wellness
- ☐ Labor and Delivery
- ☐ Nutrition During Pregnancy
- ☐ Nutrition for the Postpartum Mother
- ☐ Parenting: A View of the Early Years
- ☐ Physical Changes During Pregnancy
- ☐ Plain Talk About Childhood Immunizations
- ☐ Pregnancy and Your Oral Health
- ☐ Psychological and Interpersonal Issues Postpartum
- ☐ Reproductive and Developmental Hazards (Occupational Safety)
- ☐ Sexual Health During Pregnancy and After Delivery
- ☐ Social Services for Military Families
- ☐ Substance Abuse During Pregnancy
- ☐ Stress Management for Parents

9. **I would like a class on the following topic that was NOT given during the education component of PPPT.**

	Very well trained	Adequately trained	I'm not sure	Not trained enough	Very lacking in training/competence
10. How would you rate the training/competence of the exercise leaders?	○	○	○	○	○

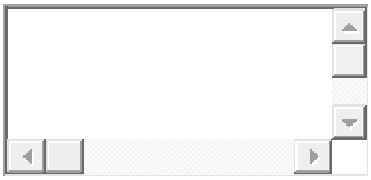
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
11. The PPPT enrollment and disenrollment process was easy and provided satisfactory accountability.	○	○	○	○	○
12. Your chain of command was very supportive of your participation in PPPT	○	○	○	○	○
13. Your health care provider was very helpful and provided supportive care.	○	○	○	○	○

14. What installation PPPT Program did you participate in? [click on the arrow next to the box below to see the list]

15. Check what you would change about the exercise component of the PPPT Program. (choose all that apply)

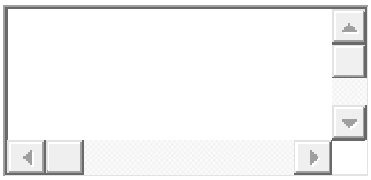
- ☐ Offer another exercise time of day (in addition to during PT time)
- ☐ Increase length of exercise class (more than 60 minutes)
- ☐ Increase variety of muscular strength/resistance exercises
- ☐ Schedule a different cardiovascular exercise content everyday
- ☐ Include water aerobics more than once a week
- ☐ Include circuit training more often
- ☐ Have more variety in music used for aerobics routines
- ☐ Not follow an aerobics DVD for cardio exercise
- ☐ Increase frequency of running for postpartum (more than 3 times a week).
- ☐ Increase frequency of exercise sessions (more than 3 times a week).
- ☐ Increase use of calisthenics for postpartum.
- ☐ Increase use of dumbbells for resistance training.
- ☐ Increase size of the exercise platoons (divide by trimester)
- ☐ Decrease size of the exercise platoons (NOT divide by each trimester)

- [ ] Decrease the turnover rate of exercise leaders to no more frequently than every 3 months
- [ ] Increase the turnover rate of exercise leaders to more frequently than every 6 months
- [ ] Have exercise leaders be military members not civilians
- [ ] Facilities used for PPPT exercise session
- [ ] Location of walk/jog/run exercise
- [ ] Allowing BN and BDE NCOs to observe exercise session and not participate with us.
- [ ] Would not change anything
- [ ] Would change something not on the list.



16. Check what you would change about the education component of the PPPT Program. (choose all that apply)

- [ ] Change education class content so is more interactive
- [ ] Increase frequency of education class to at least once a week
- [ ] Vary staff that teach the education classes
- [ ] Facilities used for education classes
- [ ] Offer special education classes for postpartum once a month
- [ ] Would not change anything
- [ ] Would change something not on the list
- [ ] Would like a class on the following topic



17. What experience did you have with regard to breastfeeding?

- ○ Did not breastfeed
- ○ Breastfed only during 6-week convalescent leave
- ○ Breastfed beyond the 6-week convalescent leave

18. Does your installation or workplace offer a lactation room (dedicated space to allow you to pump during the work day)?

- No
- Yes, but only at the MTF
- Yes, but not in my building
- Yes, in my building
- Yes, but I did not utilize it

Submit