

# Conceptual Model of Military Women's Life Events and Well-Being

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**ABSTRACT** This article presents a life course conceptual model and applies it to the study of military women's experiences and the effect of those life events on their well-being. Of special concern are the effects on women serving in direct combat jobs, as well as in any specialties operating in a hostile environment. Drawing on previous research, the model considers and gives examples of how a woman's well-being is affected by events in her military career, her family life, and other areas of life. The article emphasizes the effects of intersections of multiple events, as well as how the effects on well-being are mediated or moderated by other factors, including individual characteristics, military contextual variables, and resources. The analysis also includes the impacts of preventative and treatment interventions, as well as of policies, programs, and practices. Based on the model and on previous research, questions for future research are posed.

## INTRODUCTION

A great deal of research has been conducted—and more is being conducted now—on service members' experiences and their effects on their well-being. Research also covers the effects of the military family lifestyle on the spouses and children of service members. Interventions are being designed and tested in attempts to ameliorate negative effects on service member and family well-being. Most of the research on service member and family well-being has been conducted on and applied to military men, not women. This article focuses on the impact of military experiences on military women's well-being, especially participation in combat.

This model draws heavily on one developed in support of the Military Operational Medicine Research Program by Mady W. Segal, Michelle D. Lane, and Ashley G. Fisher. This adaptation of the model focuses on military women's life events and their effects on well-being. To understand the entire model, see their article, "Conceptual Model of Military Career and Family Life Course Events, Intersections, and Effects on Well-Being."<sup>1</sup>

The model presented here is intended to organize our conceptual approach to this body of research, categorizing the results obtained and driving strategic planning. It also provides a framework to synthesize results from multiple studies and elucidate connections among seemingly disparate research areas. Gaps in our knowledge should become more evident and lead to further research. Understanding individual events in military women's lives—and the intersections among different events—

highlights places where interventions are needed to minimize negative effects via both prevention and treatment. Changes needed in policies and practices are also identified. Using this model also helps to identify ways to foster positive personal outcomes for military women, such as resilience, well-being, and growth as well as positive military organizational outcomes, such as force fitness, morale, readiness, and retention.

This article is not intended as a review of all of the relevant literature or a meta-analysis, but the ideas presented draw on the literature on military women and on military families, primarily in the United States. Life course theory is very useful for our conceptual model. Like others applying the life course approach to military effects on veterans' lives, we build on the pioneering theoretical and empirical work of Glen Elder. Elder analyzed how service in World War II affected male veterans throughout their life course, as well as how their experiences and subsequent achievements and well-being varied as a function of their individual and social characteristics (including their age, social class, and marital status).<sup>2-4</sup> Recent contributions have highlighted the ways in which life course concepts and principles are directly applicable to research on service members and their families.<sup>5</sup> Unlike most previous research, we focus our attention in this version of the model on military women's life events and well-being.

This new conceptual model we present here is quite consistent with other prominent approaches to military and civilian family well-being.<sup>1</sup> We extend that analysis by specifically considering the impacts of common intersections among multiple military demands, as well as between military demands and family life course events. There are many statements and explanations of Life Course Theory. We encourage readers who desire a thorough understanding of the theory to consult some of the many theoretical treatments of the approach, as well as empirical applications to the military life course.

There are five major principles of life course theory: "life-long development," "human agency," "location in time and place," "timing," and "linked lives." Two corollary hypotheses have been proposed regarding the role of military service in the lives of those who serve: "the military-as-turning point" and the "life-course-disruption" hypotheses. Both view service

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in the armed forces as having an important impact on individual lives, causing “transitions” and changing the “trajectories” of the life course. The two views differ in whether they see mostly positive or negative effects. The “military-as-turning point” hypothesis sees service as increasing a person’s life chances, whereas the “life-course-disruption” hypothesis posits service as interfering with the person’s social world and disrupting relationships. Empirical results testing these hypotheses are complex and vary by historical times and the characteristics of the individual.

As shown in the diagram of our model (see Fig. 1), the well-being of military women and their families is the central focus of the model, the major dependent variable. Well-being has several components, including physical, psychological, financial, military, family, and other outcomes (the latter could include spiritual, recreational, and whatever else is important to the individual). The model considers the well-being of military women and their families (that primarily covers spouses and children, but could also be applied to parents, extended family, and others important to the service member or to whom the service member is important). Military outcomes in the model include those for the service member, as well as the health of the organization (force readiness, personnel retention, organizational climate, public opinion about the military, etc.).

Various measures of well-being have been used in research. Commonly used are direct measures of life satisfaction in various domains that are similar to the different outcomes in this model (such as health, marriage, parenthood, work, financial, spiritual, and leisure). For physical and psychological well-being,

measures include symptom checklists and direct questions about frequency of experiencing both positive feelings (happiness, pride, contentment, sense of achievement, personal worth, confidence, efficacy, etc.) and negative feelings (sadness, depression, anxiety, fear, panic, loneliness, etc.). Physical injuries, both temporary and permanent, are indicative of negative well-being.

Measures of military outcomes include: organizational climate questions; ratings of leaders, peers, and subordinates; and perceptions of support for service members and their families. An example of human agency is how military outcomes, such as personnel retention, are affected by the satisfaction, attitudes, and decisions of service members and their spouses.

This model is complex. It specifies four dimensions of the military family life course: Service Member’s Military Career Life Course, Family Life Course (including service member and spouse events), Women’s Reproductive and Gynecological Issues, and Unexpected (but Common) Major Life Events. This text presentation of the model is not meant to be exhaustive, but rather to provide examples of the likely effects of various life events and to present questions for research to address. We raise questions that are important for research to answer as guides for future research (and to be analyzed using existing research). We consider the impacts on well-being of a specific type of event, but we also emphasize the effects of intersections of multiple events; the latter is less likely to be measured in existing research and we focus attention on some intersections between (and among) life course events that are likely to cause detriments to well-being. (For how this model relates to previous approaches and for

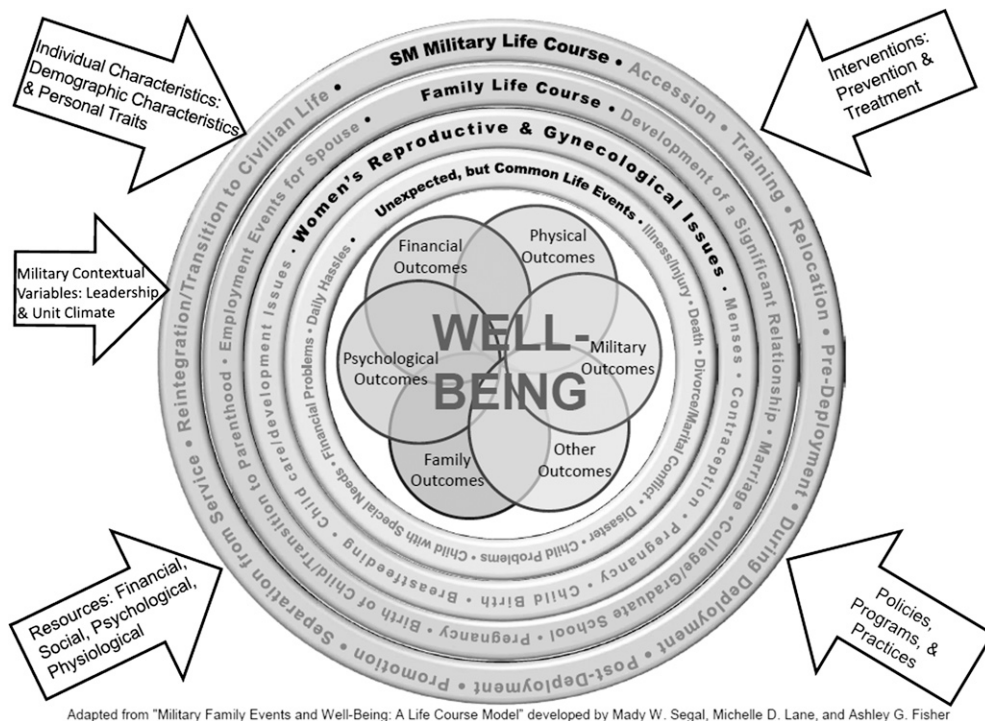


FIGURE 1. Military women’s life events and well-being: a life course model.

brief definitions of the major concepts of life course theory, see the original model.<sup>1</sup>) In viewing the model, imagine the concentric circles in the diagram moving independently of one another to create myriad intersections. Attention to and analysis of these intersections is a relatively unique aspect of this model. Although stress models often consider the additive negative effect of stressful events on well-being, this model emphasizes the common and predictable intersections that military personnel and their family members face.

In addition, characteristics of individuals and their social situations are important mediators and moderators of the effects. The effects of life course events on well-being are likely to vary as a function of individual characteristics and demographic variables, such as sex, race, ethnicity, age, sexual orientation, education, socioeconomic status background, family size, marital status of parents, adoption, military family background, reason for entering service, and childhood and life experiences. Such variables may serve as mediators or moderators of effects of the event on well-being.

These effects also vary according to the historical context. Today's service members and recent veterans have experienced a wartime environment, with many injuries, both physical and psychological (and these have serious effects on their loved ones, just one example of linked lives). Thus, there is a critical need for services for these recent veterans that provide support for mental health, as well as transition to education and employment. The provisions of services to veterans have been delayed recently because of the increased demand on the system and mismanagement within the system. Women constitute an increasing proportion of these veterans.

Another historical period effect is that current personnel serve in an era of downsizing. Also, the force and social norms have changed over the past decades and are continuing to evolve (e.g., increases in military women's numbers and roles, dual-service couples, and single parents).<sup>6,7</sup>

Like the World War II veterans studied by Elder<sup>2</sup> there is a positive impact of GI Bill benefits. Other factors that affect well-being in the face of these events are financial resources, personal resiliency, and social support. The latter includes informal social support as well as the "community capacity" of the surrounding civilian area.<sup>8-11</sup> Also important are military contextual factors, such as leaders' behaviors, unit climate, community strength, and organizational policies and practices.<sup>1,12-14</sup> Modeling and measuring such causal dynamics is a gap in much of the research that has been done. These mediating and moderating variables are shown in the diagram in the arrows outside the circles.

The conceptual model—and the research that supports it and that it inspires—also helps to identify where changes can be made to improve personal well-being and organizational outcomes. Major attention in research and clinical practice should be given to improving well-being by making organizational changes (in policies, programs, and practices) and by developing and evaluating the effectiveness of interventions. Such interventions include both those that help to

prevent stressful events from negatively affecting well-being and those that provide treatment to service members and their families after they have experienced events that are harmful to well-being. The military provides myriad programs to support service members and their families.<sup>6</sup> Many active scholars and practitioners have noted the paucity of systematic program evaluation research, especially assessments planned before the development and expansion of the programs.<sup>15</sup>

All life course events identified may be repeated over the life course. Some are more likely to be repeated than others. For example, for the Service Member Military Life Course, promotions, relocations, training, and deployments are likely to recur. A break in service (resulting in an additional accession, an additional separation, and an additional transition to civilian life) is unlikely to occur for most service members more than once. Reserve component personnel are more likely to experience this repeatedly, creating multiple potential disruptions and/or turning points in their lives. For the Family Life Course, events likely to recur include development of a significant relationship, pregnancy, and birth of child. For dual-service couples, there would be two service member military life courses (adding another ring around the center of the diagram). Given the high percentage of military women who are married to military (or veteran) men, two service member life courses would be common for the representation of the lives of military women.

This model is intended to be as comprehensive as possible. One research project is not likely to be able to capture all the variables in the model. Rather, the model can guide researchers to variables that play a role in service member and family well-being and organizational outcomes from which they can select the ones most relevant to the objectives of their specific projects. Then results from multiple projects can be categorized using the model, thereby accumulating scientific knowledge on the processes.

## EXAMPLES OF APPLICATION OF THE MODEL

In this section, we present some of the important questions about military women's well-being derived from the research literature and this conceptual model. We focus on issues related to combat. We identify some of the answers provided by other articles in this Supplement, as well as questions for further research.

### **Service Member Military Life Course**

#### *Accession/Training*

Military women's experiences with accession and training will change as additional positions open to women that had previously been closed. The research on the development of gender-neutral physical standards is critical to this process. There is a critical need for research on how these changes affect women's well-being, including the likelihood of physical injuries. In their review of the literature, Nindl et al, in their article in this Supplement, report that women have higher rates of injuries in training. Although they recommend more

research on the conditions under which injuries are most likely to occur (and for whom), they also show that there is already enough scientific evidence to serve as the basis for changing training methods to optimize performance and well-being of both men and women service members and for integrating women into combat-centric ground specialties. They make policy recommendations for recruiting, selecting, training, and deploying combat personnel.

Although the research reviewed by Nindl et al is suggestive, these experts also recommend more attention be paid to measuring controlling conditions (what we call moderators in this model). For example, sex differences in physical performance are often reduced or disappear (and sometimes even reverse) when stratifying by such factors as body size, prior training, and/or physical fitness (both health-related and skill-related components). Nindl et al stress the importance of including multiple physical measures to get a true picture. For example, research results show that body mass index (BMI) has different effects for men and women, so that women whose BMI is higher but who are aerobically fit may be less prone to injuries from musculoskeletal tasks, but men with higher BMI and who are aerobically fit are not as protected from injury. Thus, using low BMI as a selection factor may screen out women who are more able to perform some combat jobs. This is just one of the findings suggesting that the ability to perform physically demanding combat tasks is complex and dependent upon multiple and interacting factors and that the equations are not the same for men and women.

Research is also needed on women's acceptance in training for these positions by their male peers. As noted in articles in this volume (e.g., the articles by Cohn, by Segal, Smith, Segal, and Canuso, and by Moosey), leadership behaviors are likely to affect the degree to which women are accepted. Further research on these dynamics will provide ideas and evidence for optimizing women's performance and well-being.

Adequate nutrition is always important, but it will be especially important for military women in physically demanding combat specialties and in all of their training, starting even before they begin Initial Entry Training. McClung and Gaffney-Stomberg's article in this Supplement reviews military nutritional regulations, research on women's specific need for certain nutrients (especially iron, calcium, vitamin D, and folates), and makes specific recommendations for policy and practice. For example, iron deficiency results in poor physical and cognitive performance. A study of women completing Army basic combat training showed that more than 50% of them had iron deficiency or iron deficiency anemia. Women warfighters need to take calcium and vitamin D to reduce the risk of stress fractures in training and on deployments. Indeed, for women's well-being and performance, it would be best for them to start taking supplements before they enter the military.

#### *Deployment*

What are the effects of deployment on well-being? How do these effects vary by the nature of the deployment experience,

such as actual combat for those in offensive combat units compared to combat support units, the length of the deployment, leader behaviors, peer behaviors, unit climate, living conditions, and the time since last return from deployment? How do the effects on well-being vary by the service member's characteristics (e.g., gender, rank, race, education, family status, and personal traits) and by resources (e.g., financial situation and social support in the unit and at home)?

Research suggests that there are gender differences in the adverse psychological effects of deployment, including increased risk of suicide during deployment among female Soldiers.<sup>16</sup> Women also appear to be at moderately higher risk for developing post-traumatic stress disorder following Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) deployments compared to men; however, study results have been mixed.<sup>17,18</sup>

In her article in this Supplement, McGraw concludes that the extant literature on sex differences in psychological reactions to the experience of combat suffers from serious methodological limitations, including small sample sizes and retrospective reporting months after the deployment. However, research identifies social support as a crucial protective moderating factor in post-deployment psychological health, with results that suggest that women in combat may be even more affected by social support—or lack of it—than men. When acts (by group members or institutional/organizational policy or practice) exclude an individual from the group, such ostracism can have negative psychological and physical consequences to the individual who is ostracized, as well as to other members of the group witnessing this ostracism. Indeed, experimental research reviewed by McGraw shows that brain activity in response to ostracism is similar to neural responses to physical pain. These results have important implications for the physical and psychological well-being of all military women, with particular concerns about how women are treated by their group members. This provides further evidence to support the critical effects of behaviors of leaders and peers identified by Segal, Smith, Segal, and Canuso in their article reviewing other bodies of research. Clearly research on the impact of combat experience on women's (and men's) well-being requires that social support (of various kinds) be included in measurement and analysis. Ostracism of women by men who consider women as unable to deal with the stress of combat could be a self-fulfilling prophecy. This reinforces recommendations that leaders be held accountable for the way all unit members are treated: for the well-being of all members and the performance of the unit.

#### *Reintegration/Transition to Civilian Life*

Data suggest that Veterans Affairs services are historically underutilized by women.<sup>19</sup> This may result in a less robust support system upon separation from service. Does the primarily male environment at Veterans Affairs Medical Centers play a role in the underutilization of services? If so, what changes in the delivery system are likely to improve access and participation?

Access to GI Bill educational benefits has the potential to contribute positively to veterans' psychological and financial well-being. An important question is whether women have been using these benefits in the same proportion as men. Some evidence suggests that women are about as likely or even more likely than male veterans to use these benefits, but it is not clear what the data show when women are compared to men who served during the same era and for the same amount of time.<sup>20</sup> There is some indication that college completion rates of women veterans from 2000 to 2009 (21%) are higher than their male counterparts (16.3%) and higher than nonveteran women (18.2%).<sup>21</sup>

There are indications that the well-being of women veterans of the post-2001 era is worse than that of their male counterparts. For example, a report by the Disabled American Veterans suggests that women veterans of the wars in Iraq and Afghanistan are more likely than men to have difficulty transitioning to civilian life, with negative mental health effects and higher unemployment. This report also cites a "disturbingly high rate of homelessness among women veterans—at least twice as high as women nonveterans."<sup>22</sup> Women also report a lack of recognition from others of their service.

Research should also investigate how women's experiences in the military affect their transitions to civilian life and their use of benefits. For example, do women who have served in combat zones (whether in direct combat jobs or not) use GI Bill benefits in the same rates as women who have not served in combat theaters? What other individual characteristics and resources affect women veterans' likelihood of accessing educational benefits and their educational outcomes? What are the effects on psychological well-being (as well as on the use of benefits) of marital status, number and ages of children, and residential location (including potentially tied migration if married to a service member)? Are women affected differently from men by the time limits on the benefits? Which resources, both formal services and informal social support, are more effective in creating positive effects on well-being in the aftermath of military service, especially in combat?

#### *Intersections Between and Among Events*

What is the impact on well-being when a service member is relocated shortly after returning from deployment? How is this impact affected by, for example, the service member's gender, marital and parenthood status, rank, resources, and personal traits (such as adaptability)? How is the well-being effect affected by pregnancy? What about if the service member is in a significant relationship that would not result in imminent marriage had the relocation orders not happened?

What is the effect on well-being when a service member must relocate (or deploy or go away for training) while his/her child is having development issues? How is the impact affected by other factors (e.g., organizational policies, personal and social resources, unit climate, and leader behaviors)?

A large percentage of married military women are in dual-service marriages. What are the special well-being effects of

military life course events on these couples? For example, how many couples are negatively affected by frequent relocations and the difficulty of trying to be assigned in the same or near locations? What factors affect the impact, such as rank, military specialty, parental status, leadership behaviors, arrows in the diagram, and practices (such as the efforts—or lack thereof—of decision makers to assign the two service members to the same location)?

Research suggests that female service members may not be provided with similar support mechanisms that are afforded to male service members.<sup>23</sup> Work–family boundaries also appear to be more flexible for dual-military couples than for dual-career couples, allowing for more work–family management.

Relocation disrupts spouse employment and has negative consequences for spouse and service member financial and psychological well-being. How are these effects different as a function of rank and gender of service member, spouse education and occupation, spouse employment programs, time since last relocation, service member and spouse personal traits, etc.?

#### **Family Life Course**

The vast majority of research on military families has been on male service members with civilian wives. Many studies remove the military women from the analysis because there are so few of them. Clearly, to know more about military women's family life course, research must be aimed at them; studies that include military men and women must oversample women. Demographic research shows some differences between military men and women in their families. As reported in articles in this Supplement by Segal et al and by Southwell and MacDermid Wadsworth, military women are less likely to be married than their male peers, but those who are married are five times more likely to be married to another service member. (This is to be expected since the same number of men and women are in dual-service marriages and there are so many fewer women in the military.) Although women are less likely to have children than men, they are more likely than men to be single parents. Military women have higher divorce rates than their male counterparts and their age-matched civilian counterparts.

Southwell and MacDermid Wadsworth's qualitative research shows the challenges for civilian men married to military women, even those who are military veterans. Their results are consistent with earlier research.<sup>24,25</sup>

The article by Segal et al elaborates on the unique challenges women with children tend to face before, during, and after deployments, including childcare decisions, concerns about their children, and post-deployment mental health problems. Although some men also experience these issues, women tend to be more affected by them. On the other hand, some military mothers say that being deployed was less stressful than being at home and having to balance military and family demands. More research is needed, especially on the conditions that modify the effects on well-being, including military policies, women's demographic characteristics, the

timing of deployments and relocations in the family life course, and leader and peer behaviors.

The paid maternity leave in the military is an important benefit for military women, but the length of the leave needs to be evaluated. The Navy and Marine Corps has had a policy change increasing the leave time from 6 to 18 weeks and it remains to be seen whether the other services will follow suit. Such an extension is highly likely to increase new military mothers' well-being and is also likely to increase their retention.

Since a large proportion of military women are in dual-service marriages, attention needs to be paid—in research and in policy—to these couples' well-being. Extant research shows that the greatest issue for many of these couples is being able to live together; getting colocated assignments is an ongoing challenge.<sup>26,27</sup> This is likely to grow as an issue for women in combat specialties that deploy frequently. We can also anticipate more military women in same sex couples in the future. These families will need to be studied as well.

### **Women's Reproductive and Gynecological Issues**

There has been insufficient attention in research and policy to issues of military women's reproductive and gynecological well-being. Much of the attention has been negative, focusing on the potential negative consequence of women's gynecological and obstetric characteristics on military performance and organizational readiness. Such issues have been used in the past to exclude women from the military or certain roles in the military. For example, pregnancy is seen as a detractor to readiness because of loss time. Although pregnancy rates are typically required to be reported by military units, men's "loss time" for such factors as sports injuries and substance abuse (which are higher than women's) are not given the same level of scrutiny. Research is needed on the realities of these issues, their effects on women's well-being, and policies and practices that can ameliorate problems.

#### *Menses and Other Sanitation Issues*

Menstruation and menstrual sanitation necessitate multiple considerations for military women stationed in varying environments and geographic locations. Important considerations include the availability of tampons/sanitary napkins and how this varies by location, the effects on women's well-being of the degree of availability, whether oral contraception is used to regulate menses and how this practice affects physical and psychological well-being, and the availability of contraceptives to women.

In addition to menstrual sanitation, there are other relevant sanitation factors to consider for military women. These include the effect of lack of sanitation in field situations on women's well-being, the frequency of urinary tract infections and how this frequency is affected by policies and practices (such as providing women with privacy to urinate), and the effect on women's well-being if there are problems with changing tampons in field/combat situations. We also need to know how common it is for women to avoid drinking fluids

so that they do not have to urinate. We know that deployed women are at increased risk for developing yeast infections.<sup>28</sup>

It is important to understand how all of these issues are moderated by policies, practices, leader behavior, peer behavior, women's rank, personal resiliency, etc., as well as how successful unit leaders are in communicating about these topics with their subordinates. We also need research on ways in which training and ideas such as those Moosey has detailed in his article in this Supplement can be promulgated throughout the services and evaluation of their degree of adoption and success.

#### *Pregnancy*

Several factors to consider related to pregnancy that can be analyzed using our model include the availability of birth control (including oral contraceptives), both at their permanent duty station and when deployed and how this availability is affected by the woman's rank, marital status, medical policies, etc. We also need to know the frequency of unexpected pregnancy, its effects on well-being, and how these effects vary by the woman's rank, marital status, resources (such as social support), leader behaviors, peer behavior, etc., the availability of pregnancy counseling and how this varies by location, rank, etc., and the availability of abortion services to military women and how this differs by location. Additionally, it is important to understand the frequency with which postponement of parenthood causes infertility for military women, what the effect is on the women's well-being, and how these decisions are affected by policies, practices, leader behavior, peer behavior, etc., how a pregnant woman's well-being is affected by the behaviors of her leaders and peers, the percentage of military women who experience stigma because they are pregnant, its effects on the women's well-being, and the other factors that moderate these effects.

Although active duty military women's unintended pregnancy rates, contraceptive use, and contraceptive failures are similar to civilian women of the same ages, the consequences are likely to be more negative for military women's well-being and for the organization, especially if the women are deployed. Further, about half or more of pregnancies among military women are unintended. See the article by Krulewitch in this Supplement for more details, analysis, potential interventions, and research gaps in answering questions about pregnancy and deployments, including the relationship between birth defects and exposure to burn pits or vaccines, as well as ectopic pregnancies. Access to contraceptives while deployed has been limited in the past, but has increased. Although studies have been conducted on some of the important questions, the results are mixed and incomplete; much more research is needed. Krulewitch also makes recommendations on the basis of what is known.

Women also need to have proper nutrition. For example, folates are important before and during pregnancy, as well as during lactation.

#### *Breast-feeding*

Issues related to breast-feeding include the effects of breast-feeding on women's well-being, how leader and peer behaviors

affect the ability of the women to breast-feed their babies, and how policies—both general and local—affect this ability.

### **Unexpected (but Common) Major Life Events**

#### *Illness and Injury*

Deaths and injuries are risks of military service, not only in combat, but also in training. There is scant published research on specific injuries to military women in combat environments. The article by Dye et al in this Supplement reports on a study of combat-related injuries to 835 American military women in OIF and OEF (not including those who died from injuries). They find that about the same number of injuries occurred in OIF and OEF, that blast events account for more than 90% of injury episodes, and that the severity of injuries was similar for male blast events. They also report that the majority of women (about 65%) experienced poly-trauma (having more than one injury), with head injuries being the most common. Their findings and conclusions begin to fill the gap in our knowledge and provide ideas for future research, such as how traumatic brain injury effects differ between men and women, as well as identifying possible preventions and remedies for all service members.

Many questions about women's injuries remain, including the effects on all components of women's well-being and on their relationships, including with their families (parents, siblings, spouses, and children). Research is needed on these effects, as well as the conditions that moderate the effects, such as the success of specific policies and intervention programs.

Relevant here is the role of human systems integration to design equipment and military training so as to accommodate the largest pool of potential service members, including women in combat specialties. The article by Savage-Knepshield et al in this Supplement provides a review of appropriate human systems integration techniques, including those that can minimize the risk of injuries. They also report on research examining sex differences in cognitive abilities relevant to military job performance and conclude that differences decrease or even disappear when controlling for other variables, especially training and experience. They make recommendations for policies and practice to optimize individual well-being and organizational performance on the basis of existing evidence. They emphasize that preventing injuries to women requires taking into account female physique in early stages of equipment and workspace design. They also indicate the kind of additional research that is needed.

#### *Military Sexual Assault*

In the context of minimizing injuries to military women's well-being, we consider a source of preventable injuries experienced by many military women: sexual assault and/or sexual harassment. Although these inappropriate behaviors (some of which are criminal) are common in civilian society, the nature of the military culture creates additional problems for victims of military sexual assault or harassment compared to civilian

victims of sexual assault or harassment because of the hierarchical structure of the military, the emphasis on loyalty, group cohesion, and team work, etc. Many cases of military sexual assault and/or harassment are not reported because of concerns about confidentiality, adverse treatment by peers and supervisors, and beliefs that nothing will be done.<sup>29-31</sup>

The relatively minor types of sexual harassment are highly likely not to be reported, sometimes because the punishments of perpetrators are out of proportion to the offense, leading the victims to be ostracized by peers. The minor forms include sexual comments, jokes with sexual content, offensive pictures or posters, gestures, and nicknames. Although these behaviors are offensive, especially if repeated, proportional reactions to offenses are recommended. If leaders (or peers) put a stop to these behaviors without severe punishment of the perpetrator, recipients of the offensive behavior are more likely to report it. There should be more serious punishment for repeat offenders and for anyone who ostracizes the victim for reporting infractions.

The article in this Supplement by Jeffrey and Mattiko on alcohol use among active duty women finds significant relationships between scores on the Alcohol Use Disorders Identification Test and all measures of military women's experiencing physical abuse or unwanted sexual contact (before and during their military service, by someone in the military or a civilian). The authors are using these experiences as predictors of high levels of alcohol use, but causality could go both ways; that is, using alcohol to excess is a risk factor for being assaulted. More research is needed to sort out the processes involved.

Stander and Thomsen, in their article in this Supplement, report serious and long-term negative effects on the well-being of military women who are victims of military sexual trauma, including physical, mental, and behavioral. They also note that sexual harassment and assault seem to be more highly linked in the military than among civilians and they recommend additional research on this, as well as better estimates of rates of these behaviors. In accordance with our approach in this conceptual model, Stander and Thomsen note the need to analyze subgroup differences and mediators and moderators of the effects of Military Sexual Assault.

### **CONCLUSION**

There are many findings and recommendations in this Supplement for additional research that is needed, for changes in policies and practices, and other mechanisms to optimize the well-being of military women and their families. The implementation of these recommendations will be important for all military women, but especially for those who become the pioneers in the combat specialties from which women have been excluded. This model is expected to be elaborated and revised as more research is conducted on military women's life course and knowledge is expanded to include women's experiences—hopefully using this model as a framework to organize the knowledge.

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## REFERENCES

1. Segal MW, Lane MD, Fisher AG: Conceptual model of military career and family life course events, intersections, and effects on well-being. *Mil Behav Health* 2015; 3(2): 95–107.
2. Elder GH Jr: Military times and turning points in men's lives. *Dev Psychol* 1986; 22(2): 233–45.
3. Elder GH Jr: War mobilization and the life course: a cohort of World War II veterans. *Sociol Forum* 1987; 2(3): 449–72.
4. Elder GH Jr, Gimbel C, Ivie RL: Turning points in life: the case of military service and war. *Mil Psychol* 1991; 3(4): 215–31.
5. Wilmoth JM, London AS: Life-course perspectives on military service: an introduction. In: *Life-Course Perspectives on Military Service*, pp 1–18. Edited by Wilmoth JM, London AS. New York, Routledge, 2013.
6. Booth B, Segal MW, Bell DB, et al: What We Know About Army Families: 2007 Update. Caliber, an ICF Company, 2007. Available at [http://tapartnership.org/enterprise/docs/RESOURCE%20BANK/RB-FAMILY-DRIVEN%20APPROACHES/General%20Resources/What\\_We\\_Know\\_about\\_Army\\_Families\\_2007.pdf](http://tapartnership.org/enterprise/docs/RESOURCE%20BANK/RB-FAMILY-DRIVEN%20APPROACHES/General%20Resources/What_We_Know_about_Army_Families_2007.pdf); accessed June 3, 2015.
7. Segal MW, Thanner MH, Segal DR: Hispanic and African American women and men in the U.S. military: trends in representation. *Race, Gender, and Class* 2007; 14(3–4): 48–64.
8. Bowen GL, Martin JA, Mancini JA, Nelson JP: Community capacity: antecedents and consequences. *J Community Pract* 2000; 8: 1–21.
9. Huebner AJ: Shadowed by war: building community capacity to support military families. *Family Relat* 2009; 58: 216–28.
10. Bowen G, Martin J, Mancini J, Swick D: Community capacity and the psychological well-being of married United States Air Force members. In: *Military Families and War in the 21st Century: Comparative Perspectives*, pp 210–26. Edited by Moelker R, Andres M, Bowen G, Manigart P. New York, NY, Routledge, 2015.
11. Orthner DK, Rose R: SAF V Survey Report. Reunion Adjustment among Army Civilian Spouses with Returned Soldiers. 2005. Available at <http://www.armymwr.biz/docs/saf5reunionreport.pdf>; accessed June 3, 2015.
12. Bourg MC, Segal MW: The impact of family supportive policies and practices on organizational commitment to the Army. *Armed Forces Soc* 1999; 25: 633–52.
13. Segal MW: The military and the family as greedy institutions. *Armed Forces Soc* 1986; 13(1): 9–38.
14. Segal MW: Enlisted family life in the U.S. Army: a portrait of a community. In: *Life in the Rank and File: Enlisted Men and Women in the Armed Forces of the United States, Australia, Canada, and the United Kingdom*, pp 184–211. Edited by Segal DR, Sinaiko HW. Washington, DC, Pergamon-Brassey's, 1986.
15. Booth B, Segal MW, Place N: National Leadership Summit on Military Families: Final Report. Prepared for the Office of the Deputy Under Secretary of Defense, Military Community and Family Policy, 2010. Available at <http://download.militaryonesource.mil/12038/MOS/Reports/Final%20Report%20with%20Appendices.pdf>; accessed June 3, 2015.
16. Street AE, Gilman SE, Rosellini AJ, et al: Understanding the elevated suicide risk of female soldiers during deployments. *Psychol Med* 2015; 45(4): 717–26.
17. Tanielian T, Jaycox LH (editors): *Invisible Wounds of War*. Santa Monica, CA, RAND Corporation, 2008. Available at <http://www.rand.org/pubs/monographs/MG720.html>; accessed June 3, 2015.
18. Street AE, Gradus JL, Giasson HL, Vogt D, Resick PA: Gender differences among veterans deployed in support of the wars in Afghanistan and Iraq. *J Gen Intern Med* 2013; 28(Suppl 2): S556–62.
19. Washington DL, Bean-Mayberry B, Riopelle D, Yano EM: Access to care for women veterans: delayed healthcare and unmet needs. *J Gen Intern Med* 2011; 26(Suppl 2): 655–61.
20. U.S. Department of Veterans Affairs: Post-9/11 GI Bill and Other Programs. National Center for Veterans Analysis and Statistics. America's Women Veterans: Military Service History and VA Benefit Utilization Statistics. National Center for Veterans Analysis and Statistics, Department of Veterans Affairs, Washington, DC. November 2011. Available at [http://www.gibill.va.gov/benefits/post\\_911\\_gibill/index.html](http://www.gibill.va.gov/benefits/post_911_gibill/index.html); accessed June 3, 2015.
21. Holder KA: The Educational Attainment of Veterans. Housing and Household Economic Statistics Division, Industry and Occupation Branch, U.S. Census Bureau, 2007. Available at <https://www.census.gov/hhes/veterans/files/veteranseducation.pdf>; accessed June 3, 2015.
22. Murphy FM: Women Veterans: The Long Journey Home. DAV (Disabled American Veterans), 2014. Available at <http://www.dav.org/women-veterans-study/>; accessed June 3, 2015.
23. Huffman A: Dual Military Marriages: Which Gender Receives the Supervisor's Support? Poster presented at the 122nd American Psychological Association Conference, Washington, DC, August 2014. Available at <http://www.dtic.mil/dtic/tr/fulltext/u2/a613440.pdf>; accessed May 30, 2015.
24. Bourg C: Male Tokens in a Masculine Environment: Men with Military Mates. Paper presented at the 1995 Annual Meeting of the American Sociological Association, Los Angeles, CA, August 18–23, 1995. Available at <https://chrisbourg.files.wordpress.com/2012/11/male-tokens.pdf>; accessed June 3, 2015.
25. Johnson RS: Civilian husbands in the military family: current issues and future concerns. Naval Postgraduate School, Master's Thesis, Monterey, CA, 1998. Available at <https://archive.org/details/civilianhusbands00john>; accessed June 3, 2015.
26. Smith DG: Developing Pathways to Serving Together: Dual Military Couples' Life Course and Decision-Making [dissertation]. University of Maryland, College Park, MD, 2010. Available at <http://drum.lib.umd.edu/handle/1903/10880>; accessed June 3, 2015.
27. Smith DG, Segal MW: On the fast track: dual military couples navigating institutional structures. *Contemp Perspect Fam Res* 2013; 7: 213–53.
28. Ryan-Wenger NA, Neal JL, Jones AS, Lowe NK: Accuracy of vaginal symptom self-diagnosis algorithms for deployed military women. *Nurs Res* 2010; 59(1): 2–10.
29. Mengeling MA, Booth BM, Torner JC, Sadler AG: Reporting sexual assault in the military: who reports and why most servicewomen don't. *Am J Prev Med* 2014; 47(1): 17–25.
30. Defense Manpower Data Center, Human Resources Strategic Assessment Program: 2012 Workplace and Gender Relations Survey of Active Duty Members. Human Relations Survey. Washington, DC, Department of Defense, Sexual Assault Prevention and Response Office, 2013. Available at [http://www.sapr.mil/public/docs/research/2012\\_workplace\\_and\\_gender\\_relations\\_survey\\_of\\_active\\_duty\\_members-survey\\_note\\_and\\_briefing.pdf](http://www.sapr.mil/public/docs/research/2012_workplace_and_gender_relations_survey_of_active_duty_members-survey_note_and_briefing.pdf); accessed June 3, 2015.
31. Pershing JL: Why women don't report sexual harassment: a case study of an elite military institution. *Gender Issues* 2003; 21(4): 3–30.