The Psychosocial Effects of Deployment on Military Children

Eric M. Flake, MD, Beth Ellen Davis, MD, MPH, Patti L. Johnson, PhD, Laura S. Middleton, PhD

ABSTRACT: ***Objective:*** **The impact of the Global War on Terror on two million U.S. military children remains unknown. The purpose of this study was to describe the psychosocial profile of school age children during parental deployment utilizing standardized psychosocial health and stress measures, and to identify predictors of children at "high risk" for psychosocial morbidity during wartime deployment.** ***Methods:*** **Army spouses with a deployed service member and a child aged 5–12 years completed a deployment packet consisting of demographic and psychosocial questions. The psychosocial health measures included the Pediatric Symptom Checklist (PSC), the Parenting Stress Index-Short Form and the Perceived Stress Scale-4.** ***Results:*** **Overall, 32% of respondents exceeded the PSC cut off score for their child, indicating "high risk" for psychosocial morbidity and 42% reported "high risk" stress on the Parenting Stress Index-Short Form. Parenting stress significantly predicted an increase in child psychosocial morbidity (odds ratio 7.41, confidence interval 2.9–19.0, $p < 0.01$). Parents utilizing military support reported less child psychosocial morbidity (odds ratio 0.32, confidence interval 0.13–0.77, $p < 0.01$) and parental college education was related to a decrease in child psychosocial morbidity (odds ratio 0.33, confidence interval 0.13–0.81, $p < 0.02$). The effects of military rank, child gender, child age, and race or ethnic background did not reach statistical significance.** ***Conclusion:*** **Families in this study experiencing deployment identified one-third of military children at "high risk" for psychosocial morbidity. The most significant predictor of child psychosocial functioning during wartime deployment was parenting stress. Military, family and community supports help mitigate family stress during periods of deployment.**

(J Dev Behav Pediatr 30:271–278, 2009) **Index terms:** deployment, military, psychosocial morbidity, child, separation.

To a child, wartime deployment means prolonged separation from a parent, an increased sense of danger, and a routine of daily uncertainty. Since the start of the Global War on Terror, nearly 2 million children in US military families have been affected by a service member deployment. Of the 2.2 million U.S. service members today, 58% have family responsibilities and 40% average 2 children per household.[1] Children's experience during deployment can differ by age. Currently, children birth to 5 years constitute 40% of children impacted by deployment, whereas 33% are 6- to 11-year olds and 25% are adolescents, 12- to 18-years old. Special populations likely most affected by parental deployment include 95,187 (6.9%) dual military families, 74,086 (5.4%) single active duty parents, and 102,053 (7.3%) military families with special health care needs.[1]

Military families traditionally cope well with temporary (<6 months) separations.[2–4] Caregivers are accustomed to a lifestyle of managing as single parents because of deployments not related to conflicts (peacetime), training in remote locations, and military schooling. For the vast majority of children, it is unclear if peacetime deployment causes significant family distress.[4] However, wartime deployment adds a new dimension of danger, uncertainty, and prolonged separation for military families. For the first time since the Vietnam era, Army service members returning from a 15-month combat deployment begin planning to redeploy in as little as 12 months.[5] Experiencing lengthy deployments, short turn-around before redeployment and an increased sense of danger may create measurable distress in military families.

Between 30% and 50% of families temporarily relocate from their military installations to their hometowns to receive support from extended family and friends during deployments (Risher M. Personal Interview; April 11, 2007). Families choosing to remain at their assigned military installations (often distant from relatives) depend on community and military resources for support. Families with school-aged children often decide to remain at their military installations to minimize disruption of their child's education. The families of activated Reservists and the National Guard are not usually colocated with active duty military families. They may experience different effects of deployment and have varying support structures compared with active duty families.

Despite a paucity of literature on wartime deployment effects in military children, observations from pre-

From the Madigan Army Medical Center, Tacoma, WA.

Received December 2008; accepted April 2009.

The authors declare no conflict of interests.

The views expressed in this article are those of the authors and do not reflect the official policy of the Department of the Army, the Department of Defense or the U.S. Government.

Address for reprints: Eric Flake, MD, Madigan Army Medical Center, Attn: MCHJ-P Dev. Pediatrics, Tacoma, WA 98431; e-mail: eric.flake@us.army.mil or ssflake@juno.com

vious parental separations in the military suggest that children experience predictable responses during a deployment cycle.[6] Before a parent's deployment, a child may become emotionally withdrawn, apathetic, or exhibit regressive behavior. Early in deployment, the child can be overwhelmed, sad, anxious, and clingy, manifesting increased somatic complaints or developing aggressive behavior. These behaviors often diminish as most children enter a readjustment phase. During this time, they successfully adapt by developing new routines and using new supports. The at-home parent often observes the child displaying increased independence and responsibility. On reunification, there is excitement, anticipation, and relief, occasionally followed by emotional conflict as the service member reintegrates back into the family. However, 3 of every 4 families reported the first 3 months after "coming home" as the most stressful part of a deployment.[5,6] Reintegration into a family for a service member, who has been living in a warzone for 12 months or more, is a new paradigm for US families, and there is little guidance on the unique needs of these families.

Research of past military operations describes certain child populations to be more vulnerable to the effects of deployment. A study of children aged 4 to 17 years during Operation Desert Storm (1990–1991) found that boys and early school-aged children were particularly susceptible to deployment stress.[4] Children in homes with increased pre-existing family stress and maternal depression also exhibited more externalizing and internalizing behavior problems, including anxiety, depression, and aggression.[2,3,7,8] Not unexpectedly, younger parents with a lower socioeconomic status (determined by military pay grade) had more difficulties adjusting to deployments.[2] One study specifically looked at whether the gender of the deployed parent affected children differently and found no significant differences in child adaptation between deployed fathers versus mothers.[9] A recent publication suggested that military families experiencing deployments were at increased risk for child maltreatment, specifically neglectful home environments.[10]

Multiple factors influence a child's psychosocial functioning during a deployment cycle.[11] Parental functioning, support systems, family resources, and coping strategies have been shown to influence child and parent stress levels.[12] Psychosocial functioning is determined by a child's psychological development within a social environment. Psychosocial morbidity occurs when there is physical, emotional, or cognitive dysfunction.

Nationwide parents, teachers, military leaders, and health care professionals are working to provide psychosocial support to minimize the stress of military child and family.[13] Health professionals are in an ideal position to recognize and respond to the effects of deployment in children. Primary care providers are well trained in family-centered care and can recognize the psychosocial contributors to child health. Clinic appointments may potentially identify children with behavioral and medical symptoms influenced by deployment stress. It remains unclear if deployment stress is sufficient to cause significant impairment in the military child. We hypothesized that the psychosocial stress of military children and families experiencing wartime deployment is significantly higher than the psychosocial stress of children and families who do not experience wartime deployment. The objectives of this study are to describe the psychosocial profile of military school age children during parental deployment using standardized psychosocial health and stress measures and to identify predictors of those at "high risk" for psychosocial morbidity during wartime deployment.

METHODS

Participants

Army spouses with a deployed service member and a child aged 5 to 12 years were approached at a large military installation in the northwestern United States. The sample was limited to elementary school aged children to minimize the extraneous variability of behavioral responses associated with younger and older age groups. A total of 116 parents completed the deployment packet. Recruitment of the convenience sample occurred at community deployment meetings (94) and clinic posted flyers. (22) Eighty-seven percent (101/116) of respondents met inclusion criteria and provided complete data during a recent 15-month deployment (13 were excluded because of child age and 2 were excluded due to incomplete responses).

Procedure

After institutional review board approval, participants completed a deployment packet consisting of demographic and psychosocial questions. The psychosocial health measures included: the Pediatric Symptom Checklist (PSC), the Parenting Stress Index-Short Form, and the Perceived Stress Scale. These validated surveys are short questionnaires focused on screening child psychosocial morbidity and family stress.[14–17]

Measures

The PSC is a parent completed 35-item screening questionnaire used by primary care providers to assess child (age 4–17 yr) psychosocial functioning.[18] Seventeen of the 35 questions constitute valid subscales (internalizing, externalizing, and attention behavior) for determining the specific areas of psychosocial morbidity.[19–21] For each item, a parent rates his/her child's functioning on a 3-point Likert Scale of never, sometimes, or often (scored as 0, 1, or 2). Scores range from 0 to 70 with higher scores indicating greater psychosocial dysfunction. Children scoring $\geq$28 are considered at "high risk" for psychosocial morbidity.[14] According to a national PSC sample, 13% percent of parents rated their child at "high risk."[18] PSC validity was established by comparing the

results of children screened with an in-depth interview and pediatricians' ratings. Results indicate that the PSC has a specificity of 0.68 and a sensitivity of 0.95. In addition, a study of nondeployed military children found the predictive validity for psychiatric disorders to be 71.4% when children at "high risk" on the PSC were compared with their scores on the Child Behavior Checklist.[22]

The Parenting Stress Index-Short Form is a 36-item questionnaire used to assess the level of stress a parent is experiencing while raising their child. This validated scale consists of three question domains: (1) level of parental distress, (2) amount of parent-child dysfunctional interaction, and (3) dealing with a difficult child. For each item, a parent records agreement with a statement on a 5-point scale, from 1 (strongly disagree) to 5 (strongly agree). Subscale scores range from 12 to 60, and the total stress score ranges from 36 to 180 with higher scores indicating greater levels of parental stress. Responses higher than the 85th percentile (1 standard deviation above the mean) are interpreted to be "clinically significant" for high levels of family stress.[23] Validity of the short form Parenting Stress Index-Short Form was obtained by using 530 subjects to demonstrate a high correlation (0.94) with the full length Parenting Stress Index.[23]

The Perceived Stress Scale-4 is a brief 4-question parent screen which assesses perception of global stress based on each response receiving a value of 0 to 4.[17,24] A high total score is considered a risk factor for a clinical psychiatric disorder.[25] Scores greater than 1.5 standard deviation above the mean (PSS $\geq$9) are considered "at risk" for high perceived stress.

Data Analyses

After stratification by child and parent demographic profile, data were analyzed using SPSS 14.0. Categorical variables were analyzed using χ^2 testing. Continuous variables were tested using an unpaired t-test. Linear and logistic regressions were conducted to help determine the specific factors predictive of psychosocial morbidity in children and families.

RESULTS

Child and Family Demographics

The 101 spouses (86% female) of service members, (23% officers and 77% enlisted) reported two-thirds had deployed within the last 6 months, whereas the remainder had deployed within the last 15 months. Children (52% male) had a mean age of 8.6 years (standard deviation [SD] 2.2 years) and an age range of 5 to 12 years. The majority (65%) of the children described in the study were non-hispanic white (Table 1). Forty-seven percent reported 3 or more moves within the last 5 years (M = 2.7, SD 1.3). The sample is demographically similar to recent general army population statistics where two-thirds of service members were non-hispanic white, 20%

Table 1. Characteristics of the At-Home Parent (Participants), Deployed Service Members, and Children

	N = 101 (%)
At-home parent	
Gender	
Male	14 (14)
Female	87 (86)
Race/ethnicity	
White	66 (65)
Hispanic	13 (13)
Asian	9 (9)
Black	9 (9)
Other	4 (4)
Education	
Less than college degree	59 (58)
College degree or higher	42 (42)
Parent employed	35 (35)
Years married	
≤5	25 (25)
6–10	48 (48)
≥11	26 (26)
Family moves in past 5 yr	
1–2	52 (53)
3–4	34 (34)
5+	13 (13)
Deployed service member	
Education	
Less than college degree	66 (67)
College degree or higher	33 (33)
Military Rank	
Officer	22 (23)
Enlisted	75 (77)
Time with current deployed unit (mo)	
Up to 12	38 (38)
12–24	38 (38)
Over 24	24 (24)
Current duration deployed (mo)	
<6	61 (61)
6–12	25 (25)
>12	14 (14)
Children	
Age (yr)	
5–6	21 (22)
7–8	26 (27)
9–10	26 (27)
11–12	22 (23)
Gender	
Male	50 (52)
Female	46 (48)

were officers, and women comprise 15% of the active duty service members.[1]

Psychosocial Functioning

Parents reported high levels of psychosocial difficulties in their children on the PSC (M = 22.7, SD = 11.7). This was significantly higher than a national normative population (M = 15.1, SD = 10), $t(100) = 4.0$, $p < .0001$. Only 3 children were rated at or more than 2 standard deviations from the mean sample score. On the PSC, 32% (33/101) of children exceeded the cutoff for "high risk" child psychosocial morbidity (2 were >2 SD). This is 2.5 times more than national norms.[18] PSC subscales revealed 39% of children were "high risk" for internalizing symptoms, 29% for externalizing symptoms, and 13% for attention concerns (Table 2). Parents reported that 56% of their children had trouble sleeping and 14% had school-related problems to include dropping grades, decreased school interest, and teacher conflict.

On the Parenting Stress Index-Short Form (PSI-SF), 42% of parents experienced high levels of stress (M = 81.1, SD = 20.1). This is significantly higher than normative data (M = 71.0, SD 15.4) $t(100) = 5.06$, $p < .01$. PSI-SF subscales revealed high levels of parental distress (29%), parent-child dysfunctional interaction (19%), and "difficult" children (33%; Table 2).

On the PSS, parents experienced higher levels of general stress ($M = 6.00$, SD = 3.3) than national normative data (M = 4.5, SD = 3.0), $t(100) = 4.51$, $p < .01$, and 19% exceeded criteria for an "at risk" response.[25]

Overall, 55% of families were "at risk" on at least one of the 3 measures, and 10% of the families scored in the "at risk" range on all 3 questionnaires.

Parents were asked if they felt supported in a variety of ways. The majority (82%) of participants felt supported overall. Nearly two-thirds (64%) of parents felt they were supported by military groups and organizations, whereas almost half (48.5%) stated that they felt supported by their church. One quarter of parents felt supported by nonmilitary groups and organizations, and 22% indicated feeling supported by family, not living in the local area.

Predictors of Child Psychosocial Functioning

A series of linear regression analyses were conducted to evaluate the potential predictors of overall psychosocial functioning. The first set of these analyses examined demographic variables as predictors of the total PSC score and included child's age, child's gender, parent's ethnicity, number of family moves in the last 5 years, number of years married, length of time with unit, length of time deployed, educational levels for participant and deployed parent, and employment status of non-deployed parent. The demographic variables that significantly predicted increased psychosocial morbidity in child functioning were educational levels of the parents.

Table 2. Comparison of Parent PSC, PSI-SF, and PSS-4 for Children (ages 5–12 yr) With a Deployed Service Member (N = 101) and a Normative Sample

Variable	Deployed Sample		Normative Sample[a]		*p*
	Mean	SD	Mean	SD	
Parent PSC[b]					
n	101		20,165		
Total score	22.7	11.7	15.1	10.0	<.0001
Internalizing symptoms	4.1	2.1	3.8	2.8	.28
Externalizing symptoms	4.1	2.7	3.9	3.2	.53
Attention issues	3.8	2.2	3.6	2.8	.28
Percent "at risk"	32%		13%		<.0001
Parent PSI-SF[c]					
n	101		800		
Total score	81.1	20.1	71.0	15.4	<0.0001
Parental distress	28.7	9.2	26.4	7.2	<.0035
Parent-child interaction	22.8	6.7	18.7	4.8	<.0001
Difficult child	29.6	8.0	26.0	6.7	<.0001
Percent "at risk"	42%		15%		<.0001
Parent PSS-4[d]					
n	101		2387		
Total score	6.0	3.3	4.5	3.0	<.0001
Percent "At risk"	19%		15%		.37

PSC, Pediatric Symptom Checklist; PSI-SF, Parent Stress Index-Short Form; PSS-4, Perceived Stress Scale-4; SD, standard deviation. [a]Normative sample consists of general population statistics reported for validation of each assessment instrument. [b]PSC scores and norm were "at risk" for psychosocial morbidity if sum was ≥28 for children ages 5–12 yr.[19,21] [c]PSI-SF scores and norms were "at risk" if total stress was >85.[24] [d]PSS-4 scores and norms were "at risk" if total score >9.[26]

An at-home parent reporting less than a college education, ($r = .21$, $t(99) = -2.15$, $p = .03$), and a deployed parent with less than a college education ($r = .23$, $t(97) = -2.28$, $p = .03$) were more likely to report higher PSC scores.

Stress Indicators

A series of linear regression analyses evaluated the parental stress on child psychosocial functioning. Parental stress, as measured by the PSI-SF, significantly predicted an increase in reporting child psychosocial morbidity ($r = .61$, $t\ (99) = 7.66$, $p < .01$). High levels of perceived stress also significantly predicted higher child psychosocial morbidity ($r = .44$, $t\ (99) = 4.80$, $p < .01$).

Support Influences

Another series of linear regression analyses were conducted to evaluate whether perceived support predicted parent's report of child psychosocial functioning. The predictors included perceived support overall, perceived support from family, church, nonmilitary organizations or groups, and military organizations. Feeling supported overall significantly predicted child psychosocial functioning ($r = .20$, $t(99) = -2.04$, $p = .04$) as did feeling supported by a church ($r = .19$, $t(98) = -2.15$, $p = .05$) nonmilitary organizations or groups ($r = .22$, $t(99) = -2.19$, $p = .03$) and military organizations or groups ($r = .28$, $t(98) = -2.93$, $p < .01$). Nonlocal family support was not a significant predictor of child psychosocial functioning ($r = .13$, $t\ (99) = -1.32$, $p = .19$).

Predictors of Children at "High Risk" for Significant Psychosocial Morbidity

Children were identified as being at "high-risk" for psychosocial morbidity according to established criteria if their PSC scores were ≥28 (Table 3). Classification of parents with "clinically significant" stress (>85% ile scores) on the PSI-SF and PSS, significantly correlated with children at "high risk" on PSC ($p < 0.01$) Chi-square analysis of the characteristics associated with children at "high risk" on the PSC included perception of poor military or community support ($p < .01$), parental and service member education ($p < .04$), and young enlisted parents ($p < .05$). Parents married for less than 5 years at time of deployment approached significance ($p = .07$). The length of separation, time with a deployed unit, child gender, child age, and race or ethnicity were not associated with higher risk for psychosocial morbidity in this sample (Table 3).

Univariate logistic regression analysis was conducted to determine associated demographic and stress variables with children identified as "high-risk" for psychosocial morbidity. Variables assessed included parent and child characteristics, spouse education, service member education, and support systems (military and nonmilitary). Spouse and/or service members who had at least a college education were less likely to have a child with a "high risk" PSC score (odds ratio [OR] 0.33, confidence interval [CI] 0.13–0.81, $p < .02$; OR 0.34, CI 0.12–0.94, $p < .04$, respectively). Parents reporting positive military support were also less likely to have a child with a positive PSC (OR 0.32, CI 0.13–0.77, $p < .01$). Parents with high stress on the PSI-SF were most likely to identify the children with problematic behavior (OR 7.41, CI 2.90–18.99, $p < .01$). High PSS scores also increased the

Table 3. Characteristics of Children at "High Risk" for Psychosocial Morbidity (n = 33) Compared to Total Sample

Demographics	N = 101	"High Risk" PSC (N = 33)	*p*
Gender (child)			
Male	50	18	
Female	46	13	0.42
Age (child, yr) (Grade Equiv)			
5–6 (K-1)	21	4	
7–8 (2–3)	26	12	
9–10 (3–4)	22	7	
11–12 (5–6)	22	7	0.23
Ethnic origin			
White (non-hispanic)	72	23	
Non-white (hispanic, black, Asian, other)	24	7	0.80
Service member education			
Less than a college degree	66	25	
College degree or better	33	6	0.03
Parent education			
Less than a college degree	59	25	
College degree or better	42	8	0.01
Parent currently employed			
No	65	26	
Yes	35	7	0.04
Years married			
<5	25	10	
6–10	48	14	
>11	26	8	0.63
Family moves in last 5 yr			
1–2	52	18	
3 or more	47	14	0.61
Military sponsor's rank			
Enlisted	75	26	
Officer	22	5	0.29
Duration of deployment (mo)			
up to 6	61	21	
6–12	25	7	
Over 12	13	5	0.78

PSC, Pediatric Symptom Checklist.

likelihood of a child at "high risk" for psychosocial difficulties (OR 2.85, CI 1.04–7.93, $p < .04$).

Multivariate analysis, using a forward stepwise approach, determined that high parenting stress and perceived lack of military support were the most significant predictors of high risk PSC scores. After controlling for military support, the odds of a child with "high risk" PSC scores was 6 times greater for parents with high stress compared with typical stress scores (OR 6.0, CI 2.21–16.43, $p < .01$).

DISCUSSION

In this study, parental report identified 1 in every 3 (33/101) school-aged child to be at risk for psychosocial morbidity during a wartime deployment. The most significant predictor of child psychosocial functioning during wartime deployment was parental stress. Parents reporting high levels of parenting stress were likely to perceive their children as having increased psychosocial morbidity. The percentage of children at "high risk" (32%) in this study were significantly higher than a historical military sample. Although predeployment function was not assessed in this sample, a previous military study, using the PSC to screen school age military children with nondeployed parents, found only 18% (38/212) of children had "high risk" scores.[22] This rate of elevated PSC scores for children of nondeployed parents matches population-based epidemiological rates.[18] These results suggest that the stresses of deployment seem to be associated with a heightened risk for psychosocial morbidity in military children. However, it is important to remember that the PSC is a screening tool and that being "high risk" does not necessarily connote high levels of psychopathology.

PSC subscale analysis demonstrated that more than a third of parents reported that their children experienced high levels of internalizing symptoms (39%), which included being anxious, worrying often, or crying more frequently. These findings are consistent with a previous study where military children were found to have a higher than typical level of internalizing and externalizing symptoms during a previous US military wartime deployment, Desert Storm (1991) compared with normal levels of symptoms during peacetime.[4]

Numerous factors associated with deployment, such as changes in routine, parenting challenges, and worries about the service member, can influence child psychosocial functioning. In contrast to high levels of internalizing and externalizing problems in children, parental reports from the PSC did not endorse high levels of attention problems or school difficulties. We speculate that school may provide an established structure and routine that minimizes child stress. A positive school climate has been shown to impact not only academic performance but also positively influence emotions and behaviors of students.[26]

Almost one-half (42%) of parents reported "clinically significant" levels of parenting stress. Despite the large percentage of the parents reporting excessive parenting stress, only 6% would be considered "at risk" for neglect or maltreatment according to Parenting Stress Index-Short Form (PSI-SF) scoring criteria (>95%). This would imply that resources needed for identification and individualized interventions for the most at risk families is a very small percentage of the spectrum of family supports during deployment.

Overall, there is an increase in general stress for at-home parents. Deployment stress is possibly heightened by the high frequency of family moves, with the average family moving 3 times in the past 5 years when compared with the US population, which moves on average, once every 5 years. Family moves cause school routine disruption, potentially increasing a child's maladaptive symptoms.[26] For the parent, frequent relocation can result in feeling detached from the assigned unit, and both military and community local support systems.

The association of parenting stress with child problematic behavior is consistent with other population based studies of family adversity in which parental wellness is the single most predictive factor of child wellness and increased support mitigates stress.[4,27,28] Children of younger-aged parents, shorter duration of marriage, and lower socioeconomic status were at higher risk for having psychosocial symptoms in this sample. Factors mitigating the impact of wartime deployment included college level education, military support, and community support. Interestingly, employed parents who on average had higher levels of education were noted to have significantly less parenting stress and fewer children with psychosocial morbidity. Employed parents may have access to additional support networks, social support, adult interactions, and income, providing increased stress outlets and stability in routines. Feeling supported by the community, the military, or a religious congregation were all influential in minimizing the impact of deployment. The majority of parents (64%) felt supported by the military. Those using available military and community resources had fewer children score "high risk" on the PSC and demonstrated less parenting stress on the PSI-SF. The consistency of associations and findings in this study with previous research in the general population suggests that established screening methods and efficacious interventions for decreasing stress may be effective with military populations.

Although not all families require the same degree of support, all families who experience wartime deployments should be offered resources and have them accessible if needed. Available resources are more accessible for families living on a military installation than those rural families of the National Guard or Reserve components.

Primary care visits are ideal settings to inquire about parent and child stress with a deployed service member. Because children of deployed parents are at risk for more psychosocial problems, concerned responses from an attentive parent should be taken seriously. Two-thirds of the parents in our study recognized the need for addi-

tional mental health assistance, when their child scored "high risk" for psychosocial morbidity on the PSC. Inquiring about a child's behavior may also provide insight to the parent's psychosocial wellness or dysfunction.

The PSC and PSI-SF are useful tools to identify the military children and families at risk for psychosocial problems. Specific PSC subscales (inattention, externalizing, and internalizing symptoms) could assist with recommendations for additional evaluation or help focus interventions. The Perceived Stress Scale-4, designed to measure perceived stress, had a positive correlation with the PSC and PSI-SF in our study. This tool is a broad screening mechanism with less information than the other tools used and was not as sensitive as the PSC and PSI-SF in identifying "at risk" children.

Limitations in this study included use of a cross-sectional representation from active duty Army families, who had access to the local military installation. This was a convenience sample and the number of nonparticipants is not available. All informants were actively supporting a deployed service member, and as such their personal stress may have influenced their perceptions of distress observed in their child. In addition, recruitment challenges may have introduced selection bias. Anecdotally, the two primary reasons why parents declined to participate were due to the time limitations and concerns for privacy. Lack of a concurrent nondeployed control group precludes attributing increased rates of stress in the sample to deployment alone. Despite these limitations, the study informs us about the adjustment of military children and families to deployment.

Families that temporarily relocate to their home town during a deployment may be different than our study population and require future investigation. Our cohort may be older, more educated, feel more secure, and integrated than families who temporarily leave the military installation during deployment. Of the parents participating in our study, 82% reported feeling supported and completed the entire survey. These parents may represent the most capable and available, which would in fact, under represent child and family stress. Younger parents who are new to the military or those who return to their hometown may be experiencing even more stress than what was found in our sample population.

Although much attention has been devoted to the effects of deployment and combat on soldiers, little research has been conducted on the effects of deployment on children. Additional research is needed to determine the long-term effects of being a military child subjected to multiple parental separations due to wartime deployments. A longitudinal study spanning the deployment cycle (pre, deployment, and reintegration) designed to characterize the impact of deployment on the military child including child, parent, and teacher input would be beneficial. Examining a wider age range of children at various locations and considering the differences between service member rank and the cultures of each Active Duty service (Army, Marine, Navy, and Air Force), National Guard and Reserve Components, with a comparison group, would assist in providing targeted support to military families. Such future studies could further clarify the associations that were identified in this study and determine the best practices for providing interventions, such as parenting support and child coping skills.

CONCLUSION

This is the first study since 9-11 and the Global War on Terror to describe the school age children's symptoms during current parental military deployment. As expected, families experience high levels of adjustment and stress related to deployment and stress is mitigated by social supports. Families in this study, experiencing deployment, identify one-third of military children at "high risk" for psychosocial morbidity. Child manifestations of internalizing symptoms during deployment are more common than externalizing or inattention symptoms. "Clinically significant" parenting stress seems to exist in almost one-half of parents during deployment. Child and parental stress is more than double national norms. Military, family, and community supports help to mitigate family stress during periods of deployment. Assessment of specific family variables, focusing on parenting stress levels and perceptions of support, will assist providers in recognizing "high risk" children during a deployment cycle and help facilitate appropriate and timely interventions.

ACKNOWLEDGMENTS

Biostatistics support was provided by the Biostatistics Shared Resource from the Center for Biostatistics, Computing and Informatics in Biology and Medicine at Oregon Health and Science University, Portland, OR.

REFERENCES

1. 2005 Demographics Profile of the Military Community. Office of the Deputy Under Secretary of Defense (Military Community and Family Policy), produced by Caliber, an ICF Consulting Company. Available at: http://www.militaryhomefront.dod.mil. Accessed November 26, 2007.
2. Jensen PS, Xenakis SN, Wolf P, Bain MW. The "military family syndrome" revisited: "by the numbers." *J Nerv Ment Dis.* 1991; 179:102–107.
3. Kelley ML, Hock E, Bonney JF, Jarvis MS, Smith KM, Gaffney MA. Navy mothers experiencing and not experiencing deployment: reasons for staying in or leaving the military. *Mil Psychol.* 2001;13:55–71.
4. Jensen PS, Martin D, Watanabe H. Children's response to parental separation during Operation Desert Storm. *J Am Acad Child Adolesc Psychiatry.* 1996;35:433–441.
5. Report on the cycles of deployment: an analysis of survey responses from April through September 2005. Available at: http://www.nmfa.org/. Accessed November 26, 2007.
6. Pincus SH, House R, Christenson J, Adler LE. The emotional cycle of deployment a military family perspective. *US Army Med Dep J.* 2001; PB 8–01-4/5/6:15–23.
7. Rosen LN, Teitelbaum JM, Westhuis DJ. Children's reactions to the Desert Storm deployment: initial findings from a survey of Army families. *Mil Med.* 1993;158:465–469.

8. Kelley ML, Hock EP, Smith KM, Jarvis MS, Bonney JF, Gaffney MA. Internalizing and externalizing behavior of children with enlisted navy mothers experiencing military-induced separation. *J Am Acad Child Adolesc Psychiatry.* 2001;40:464–471.
9. Kelley ML, Herzog-Simmer PA, Harris MA. Effects of military-induced separation on the parenting stress and family functioning of deploying mothers. *Mil Psychol.* 1994;6:125–138.
10. Rentz ED, Marshall SW, Loomis D, Casteel C, Martin SL, Gibbs DA. Effect of deployment on the occurrence of child maltreatment in military and nonmilitary families. *Am J Epidemiol.* 2007;165:1199–1206.
11. Amen DG, Jellen L, Merves E, Lee RE. Minimizing the impact of deployment separation on military children: stages, current preventive efforts, and system recommendations. *Mil Med.* 1988; 153:441–446.
12. Drummet AC, Cable SM. Military families under stress: implications for family life education. *Fam Relat.* 2003;42:279–287.
13. Lemmon KM, Stafford EM. Recognizing and responding to child and adolescent stress: the critical role of the pediatrician. *Psychiatr Ann.* 2007;37:431–438.
14. Jellinek MS, Murphy JM, Robinson J, Feins A, Lamb S, Fenton T. Pediatric Symptom Checklist: screening school-age children for psychosocial dysfunction. *J Pediatr.* 1988;112:201–209.
15. Reitman D, Currier RO, Stickle TR. A critical evaluation of the Parenting Stress Index-Short Form (PSI-SF) in a head start population. *J Clin Child Adolesc Psychol.* 2002;31:384–392.
16. Haskett ME, Ahern LS, Ward CS, Allaire JC. Factor structure and validity of the parenting stress index-short form. *J Clin Child Adolesc Psychol.* 2006;35:302–312.
17. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav.* 1983;24:385–396.
18. Jellinek MS, Murphy JM, Little M, Pagano ME, Comer DM, Kelleher KJ. Use of the pediatric symptom checklist to screen for psychosocial problems in pediatric primary care: a national feasibility study. *Arch Pediatr Adolesc Med.* 1999; 153:254–260.
19. Gardner W, Lucas A, Kolko DJ, Campo JV. Comparison of the PSC-17 and alternative mental health screens in an at-risk primary care sample. *J Am Acad Child Adolesc Psychiatr.* 2007; 46:611–618.
20. Gardner W, Murphy M, Childs G, et al. The PSC-17: a brief pediatric symptom checklist with psychosocial problem subscales. *Ambul Child Health.* 1999;5:225–236.
21. Borowsky IW, Mozayeny S, Ireland M. Brief psychosocial screening at health supervision and acute care visits. *Pediatrics.* 2003;112:129–133.
22. Walker WO Jr, LaGrone RG, Atkinson AW. Psychosocial screening in pediatric practice: identifying high-risk children. *J Dev Behav Pediatr.* 1989;10:134–138.
23. Abidin RR. *Parenting Stress Index Test Manual*. 3rd ed. Charlottesville, VA: Pediatric Psychology Press; 1990.
24. Cohen S. *Perceived Stress Scale*-4. Available at: http://www.psy.cmu.edu/%7Escohen/. Accessed November 26, 2007.
25. Cohen SW. Perceived Stress in a Probability Sample of the U.S. Newbury Park,. CA: Sage; 1988.
26. Lynne MB. Military children's needs often unmet; School environment key to solution. Available at: http://www.jhsph.edu/mci. Accessed December 10, 2007.
27. Jensen PS, Bloedau L, DeGroot J, Ussery T, Davis H. Children at risk. I. Risk factors and child symptomatology. *J Am Acad Child Adolesc Psychiatr.* 1990;29:51–59.
28. Kelley ML. Military-induced separation in relation to maternal adjustment and children's behaviors. *Mil Psychol.* 1994;6: 163–176.