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Health care utilization among children with chronic conditions in military families

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Abstract

Background: Studies have examined utilization of health care services by civilian children with chronic conditions but not utilization among child dependents of military personnel.

Objective: To identify children with chronic conditions among military members and retirees and examine their health care utilization and its association with type of condition.

Methods: We derived our sample from child dependents ages birth to 18 years of military personnel with health care enrollment in FY2011. We defined chronic conditions based on diagnoses and repeated specialty care visits. We accrued one year of health care utilization for each child starting with the date of first diagnosis that qualified (i.e., 2 + visits). Health care utilization measures were any inpatient stay; number of outpatient visits (excluding emergency department [ED] visits), ED visits, and number of psychotropic and non-psychotropic prescriptions.

Results: Conditions with the highest prevalence were ADHD/conduct disorders (41.2%), other behavioral health (BH) disorders (30.4%), asthma (25.3%) and arthritis (23.8%). Boys and children ages 6e18 were more likely to have BH conditions. Twelve percent had inpatient stays, 63% used the ED, and mean ED visits was 4.6. The mean outpatient visits was 27.9. Utilization was consistently higher for children with both BH and physical health (PH) conditions, children under age 5 (except for number of psychotropic prescriptions), and those enrolled in the military's Extended Health Care Options (ECHO) program.

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Conflicts of interest

Thomas V. Williams, Ph.D., was employed by the Department of Defense's (DoD) Defense Health Agency (DHA) during the conduct of this study.

Conclusions: Prevalence and utilization findings provide data for future service planning and highlight subgroups of children with chronic conditions who may need better access to supportive military programs.

Keywords

Children with chronic conditions; Health care utilization; Military families; Developmental/behavioral issues

Although large scale studies have examined the utilization of health care services by civilian children with disabilities, chronic conditions, and special health care needs,^{1,2} few studies have examined these patterns among child dependents of military personnel. Almost 2 million children and youth are military-connected. Williams and colleagues³ estimated that 23% of children in the military's health care program for active duty members (TRICARE Prime) were children with special health care needs. These children had significantly more outpatient visits, hospital admissions and days in the hospital than children without special health care needs.

The health of children and family members of military personnel is important to the Armed Services and the medical services and health policy communities. The Armed Forces recognize the family's influence on the well-being and readiness of service members. The Military Health System (MHS) offers several programs to assist families who have children with chronic conditions and special needs. The Exceptional Family Member Program (EFMP) permits the 'station assignment' process to consider the availability of healthcare services needed by children with special needs at the projected duty station.⁴ It also helps families identify and access programs and services.⁵ The Exceptional Care Health Option (ECHO) is available for children with grave disability (diagnosed with moderate or severe intellectual disability, a serious physical disability, or an extraordinary physical or psychological condition), when the military member is active duty or activated for duty. ECHO provides partial financial coverage for required services beyond the basic TRICARE program including certain home-based services, rehabilitation, respite and even transportation.

There are also both similarities and important differences between civilian and military children and their families.⁶⁻⁹ In comparison to civilian families, service members marry at younger ages and begin families sooner. The military population includes a higher percentage of African Americans and a smaller percentage of Asian Americans. Military families move more frequently and many moves, if accompanied by family, are to remote regions of the U.S. or foreign countries. Service members can be separated from their families for long periods of time during deployments. These stressors unique to military families may be particularly salient to families of children with chronic conditions and special needs who may rely on social support, education services, and health services to a greater degree than other families.

Thus, a separate examination of the characteristics and health care utilization patterns of children with chronic conditions and special needs of military personnel and retirees is informative. Access to a comprehensive health care and military personnel data base

provides a rare opportunity to assess the health services of children with chronic conditions within the context of a health care system with relatively low access barriers.

This study identifies a group of children of military service members and retirees with chronic conditions and addresses two broad questions: (1) What are the child, service member, and family characteristics of these children with chronic conditions? and (2) Which conditions are most common and to what extent does health care utilization vary by physical, behavioral, or combined conditions and by military family characteristics? This analysis is part of a larger project analyzing the influence of the deployment of the military parent on health care utilization among this population.

Methods

Setting and Data:

The Military Health System (MHS), or TRI-CARE, is the healthcare delivery system for US military service members and retirees and their eligible spouse and child dependents. The data used for this study are from the MHS Data Repository which contains eligibility, enrollment, and healthcare services provided by military providers (i.e., direct care) and “purchased care” from civilian providers that accept TRICARE insurance. All outpatient health care encounters, inpatient care, and dispensed prescription records from direct and purchased care systems were analyzed. Demographic and enrollment information on child dependents, their military parents and associated family members was obtained from the Defense Enrollment Eligibility Reporting System (DEERS).

Study Sample:

Our sample was derived from child dependents ages birth up to 18 years in FY2011. The study team had access to selected MHS Repository Data for a related study on the influence of the deployment of the military parent on health care utilization among children with chronic conditions. FY2011 data were chosen since this was part of an elevated period of deployment for U.S. troops.

We defined chronic conditions based on two criteria, 1) conditions linked to diagnoses and 2) repeated visits for specialty care. The first criterion was based on conditions included in the Maternal and Child Health Bureau (MCHB) definition¹⁰ and used in the National Survey of Children with Special Health Care Needs (NSCSHCN) which included: anxiety, autism spectrum disorder (ASD), arthritis, asthma, attention deficit hyperactivity disorder (ADHD)/conduct disorders, blood problems, cystic fibrosis, depression/bipolar disorder, developmental delay and intellectual disability, diabetes, Down syndrome, epilepsy or seizures, head injury, heart problems, migraine or headaches, muscular dystrophy, and psychotic disorders.¹¹ We analyzed the ICD9-CM diagnosis codes on all outpatient claims in FY2011 and classified the codes using the Agency for Healthcare Research and Quality Clinical Classifications Software (CCS).¹² To qualify as a chronic condition, the child had to have the diagnosis on two outpatient claims on different dates. The set of diagnostic codes is available from the authors upon request.

The chronicity criterion was defined as at least two visits to specialty physicians within FY 2011. Specialty physicians were defined as: allergist/immunologist, cardiologist, endocrinologist, neurologist, ophthalmologist, orthopedist, otolaryngologist/ENT, physiatrist, podiatrist, psychiatrist, psychologist, psychopharmacologist, pulmonologist, and rheumatologist.¹³

Health Care Utilization:

We accrued one year of health care utilization for each child starting with the date of first diagnosis qualifying as a chronic condition and measured: number of outpatient visits (non-emergency department [ED]) visits, ED visits, inpatient stays, length of inpatient stays, number of psychotropic prescriptions and non-psychotropic prescriptions.¹⁴ Outpatient visits were unique days of service including telephone consultation, lab, radiation, durable medical equipment and excluding encounters for ED service and for administrative purposes.

Covariates: Demographic characteristics consisted of sex and age group of the child, military parent sex, age group, and marital status. Race/ethnicity of the military parent has been used as a proxy for the race/ethnicity of the child with a chronic condition because of incomplete data on dependents.¹⁵ To characterize family environment, we identified family members in FY2011 who shared a family identification number assigned to the child.

Family environment characteristics included military branch of Service and rank, region, residence within 20 miles of an outpatient Military Treatment Facility (or PRISM service area), number of other child dependents, number of other child dependents with chronic conditions, and participation in ECHO.

Data Analyses:

We provide frequencies for all characteristics and each chronic condition. For most analyses we classify children based on type of condition: *Behavioral Health (BH)* (ASD, behavior or conduct disorders, developmental delay, intellectual disability or Down syndrome, and other behavioral health conditions); *Physical Health (PH)* (arthritis; asthma; blood problems; cystic fibrosis or muscular dystrophy; diabetes; epilepsy/seizures; head injury; heart problems; and migraine/headaches), either alone or combined.

We present bivariate associations of health care measures with each characteristic and type of condition and results of multivariable logistic and linear regression models that were used to test for associations of demographic, military and family characteristics and health care utilization outcomes. We report adjusted odds ratios (Model 1) and estimates (Models 2e5) and 95% confidence intervals (CIs). The p-values were two-sided at the $p < .001$ level to account for the large sample size.

All calculations were performed using SAS/Base and SAS/STAT software (version 9.3; SAS Institute, Inc., Cary, NC). Brandeis University's Committee for Protection of Human Subjects and the Human Research Protection Program at the Office of the Assistant Secretary of Defense of Health Affairs/Defense Health Agency conducted the human

subjects review. The Defense Health agency's Privacy and Civil Liberties Office executed the data use agreements.

Results

There were 140,533 children who met the definition of chronic condition in FY 2011 and the majority were male and aged 12e18 (Table 1). Their military parents were predominantly male, in their 30s or 40s, married, non-Hispanic white, and in the Army. One-fifth had a sibling with a chronic condition(s) and 5.6% participated in ECHO. In addition, 74.4% resided within a Military Treatment Facility Service Area, indicating that they are within 20 miles of an outpatient clinic.

The most common chronic conditions were ADHD/conduct disorders, other BH disorders, asthma, and arthritis (Table 2). Co-morbid conditions were most common among children with ASD, developmental delay, intellectual disability or Down syndrome, blood problems, migraines/headache, and head injury.

Most children had more than one chronic condition and one-fourth had both PH and BH conditions (Table 3). The BH only group included similar percentages of children age 6e11 (43.4%) and age 12e18 (46.9%). About one-half of the PH only group (51.8%) and the combined BH and PH group (54.0%) were children age 12–18.

The vast majority of health care utilization (87.8% of all outpatient visits and 86.0% of all inpatient stays) occurred in purchased care settings (data not shown). Utilization was particularly high for the full sample in terms of mean number of outpatient and ED visits (Table 4). Children with multiple conditions had more health care utilization in terms of proportion with any use and average quantity used. Children with both BH and PH conditions utilized more health care than other children, with the exception of psychotropic prescriptions. Specifically, 20.1% of children with both BH and PH conditions had an inpatient stay, compared to 10.0% with PH conditions only and 7.8% with BH conditions only.

Multivariable results (Table 5) confirmed that children with both BH and PH conditions used significantly more healthcare compared to children with only BH or only PH. Specifically, compared to children with PH conditions only, children with both BH and PH conditions had 2.4 more inpatient stays, 13.3 more outpatient visits, 1 more ED visit, 1.5 more non-psychotropic prescriptions, and 5.8 more psychotropic prescriptions. Participation in ECHO was associated with 1.7 more inpatient stays, 56.4 more outpatient visits, 2.6 more ED visits, and 5.4 more non-psychotropic prescriptions compared to other chronic conditions. Compared to children without siblings with chronic conditions, children who had siblings with chronic conditions were more likely to use more outpatient visits and non-psychotropic and psychotropic prescriptions.

Among covariates, the child's sex and age predicted healthcare utilization. Female children had more inpatient stays, outpatient visits, ED visits, and non-psychotropic prescriptions, yet fewer psychotropic prescriptions compared to male children. Utilization was consistently

higher for children under age 6 with the exception that the number of psychotropic prescriptions was higher for the two older age groups.

Children whose military parent was in the Air Force, Marines, or Navy had more outpatient visits, and fewer ED visits and nonpsychotropic prescriptions, than Army children. Compared to children with a Junior Enlisted military parent, children of a military retiree used more inpatient stays, outpatient visits, nonpsychotropic prescriptions, and psychotropic prescriptions, and had fewer ED visits.

Discussion

This study provides a rare opportunity to assess the utilization of health services by children with chronic conditions within a comprehensive health care system with relatively low access barriers. Several characteristics contributed to utilization patterns. Army Branch of service, senior enlisted rank and retiree status, and participation in the ECHO program were each associated with increased healthcare utilization. The findings confirm that the ECHO program, as designed, is targeting a group with high needs. Fewer psychotropic medications in this group may indicate a preponderance of severe chronic physical conditions relative to other children with chronic conditions. ECHO eligibility includes a broader range of individuals with intellectual and physical conditions and a more restrictive range of psychological conditions. A recent report recognized the importance of ensuring that those served by ECHO have access to needed services by recommending that there be greater alignment of ECHO services with those offered by states through various Medicaid waiver programs.¹⁶ The variation in waiver program eligibility requirements and services offered across states will impact the success of this alignment.

We found that these children with chronic conditions received their care predominantly from purchased civilian providers rather than military treatment facilities. This finding demonstrates the importance of ensuring access to the specialty civilian health sector and in coordinating care between military and civilian providers for high utilizers.¹⁷ The 2015 National Defense Authorization Act (NDAA) made statutory changes in TRICARE's mental health benefits to enhance access to needed behavioral health services. It is the first major change to benefits in over 20 years, and will increase the number of institutional and individual behavioral health providers, remove historic caps on covered services, reduce cost-sharing, and remove many quantitative and qualitative limits in the spirit of benefit parity.¹⁸ If this study was replicated after these changes have taken effect, a different pattern of utilization may emerge.

For the sample as a whole, utilization was quite high especially for outpatient and ED visits compared to national data on similar civilian children.^{1,2} This may relate to differences in health care access between military and civilian children, the support provided by ECHO and EFMP, and differences in sample selection criteria.

Several measures of child conditions also figured prominently in the findings. The relative prevalence of specific conditions mirrored what has been reported for civilian children. The preponderance of emotional and behavioral conditions reflects their rapid growth in

recognition in the civilian population.^{19,20} Asthma has also been identified as a commonly reported child health issue.²¹ While arthritis is not frequently described as a childhood condition, our findings are consistent with other research on the prevalence of arthritis or other rheumatic conditions among children in the U.S. The best estimate is 294,000 children ages birth to 17 years or approximately 1 in 250 children.²²

We update the study by Williams et al.³ who incorporated the MCHB NS-CSHCN screener questions into their annual health care survey of MHS beneficiaries. They found that 23.3% of children identified with any special need were limited in their ability to do the things that most children do according to parent report. Similarly, they found that 26.2% of children identified with any special need had an emotional, developmental, or behavioral problem for which s/he needs or gets treatment or counseling. These percentages are on the low end of what we report for our four most prevalent conditions using claims data.

The analysis also found that 20.6% of families had more than one child with a chronic condition(s). It is well known that certain types of conditions may aggregate in families such as ADHD^{23,24} and ASD.^{25,26} Siblings of children with ADHD or ASD are also at higher risk for other emotional, behavioral, and psychosocial challenges.^{27,28} Unexpectedly, we reported that having more than one child with a chronic condition predicted a lower likelihood of having an inpatient stay. This may indicate these children had less severe illness associated with their conditions. Alternatively, it may imply that these families are able to better manage the conditions, perhaps due to experience.

We further reported that the number of children with chronic conditions predicted significantly more outpatient and ED visits and more non-psychotropic and psychotropic prescriptions. These findings imply their health care needs were more extensive than other children, but could also be consistent with a parent who knows how to access outpatient care and avoid hospitalizations. The finding could also reflect that the cumulative burden (e.g., higher levels of depressive symptoms and anxiety) experienced by mothers parenting multiple children with chronic conditions is associated with seeking additional outpatient services.²⁸ Future research could examine the health care utilization of siblings (with or without chronic conditions) of children with chronic conditions.

Our report of the high level of co-morbidity of conditions supports similar findings from civilian studies.²⁹ Co-morbidity is most often defined in relation to a specific index condition.³⁰ High comorbidity was found across all condition categories studied. For each chronic condition, the percent of children with at least one additional chronic condition ranged from 62.9% to 92.1%. Children with one or more other chronic conditions tend to be older. This corresponds to national data indicating a higher prevalence of special health care needs and disabilities among older children and with reports that the increase in special health care needs at older ages is associated with the emergence of emotional, behavioral, and developmental problems.^{19,31,32} We also found that children with two or more chronic conditions had significantly more health care utilization across all measures examined than children with one chronic condition. This relation has been found in studies of children with neurological conditions³³ and children with developmental disabilities.²⁹

Having both behavioral and physical health conditions also significantly increased health care utilization in comparison to physical conditions alone. Although the association between chronic health conditions and emotional, developmental and behavioral problems is known,³⁴ few studies have demonstrated the extent to which the combination of behavioral and physical health conditions impact health care utilization.

This study has a number of limitations that must be acknowledged. First, the analysis relied on claims data to define chronic conditions. The extent to which individual children faced functional limitations in terms of their daily activities as a result of these conditions is unknown. Second, we utilized the condition list from the NS-CSHCN to define our sample. There are other lists of chronic conditions that use ICD9 codes which if used could have yielded different results. In addition, the extent to which children accessed specialized services outside of the health care system, such as in school, is unknown. Further, the data represent a one year snapshot without knowing if this time period was typical given that it occurred during a period of years where deployment was elevated.

Conclusions

Despite the limitations, these findings highlight subgroups of children with chronic conditions who utilize more health care services and who may need better access to supportive military programs. A review of the ECHO eligibility criteria may be warranted to ensure alignment between conditions and use. In addition, ECHO eligibility is only granted to those who have first enrolled in EFMP.⁴ The low connection to the ECHO program but high utilization suggests that investigating EFMP enrollment and subsequent connection to ECHO may be beneficial for families of children with chronic conditions. More generally, monitoring changes in the prevalence of chronic conditions over time is necessary to ensure that resources are directed appropriately to meet continuing needs.

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Table 1

Characteristics of child, military parent, and family environment: Children with chronic conditions^a in FY 2011 (N = 140,533).

Characteristics at Time Child Met Criteria ^b	N (%)
Male military parent	129224 (92.0)
Female military parent	11309 (8.0)
Male child with chronic conditions	81826 (58.2)
Female child with chronic conditions	58707 (41.8)
Age of Military Parent	
18–24	3938 (2.8)
25–29	14768 (10.5)
30–39	54688 (38.9)
40–49	49506 (35.2)
50+	17633 (12.5)
Age of child with chronic conditions	
0–5	22067 (15.7)
6–11	47208 (33.6)
12–18	71258 (50.7)
Military parent race/ethnicity ^c	
Non-Hispanic White	93642 (66.6)
Non-Hispanic Black	21547 (15.3)
Asian/Pacific Islander	7187 (5.1)
Hispanic	11367 (8.1)
American Indian/Alaskan Native	1160 (0.8)
Other	5630 (4.0)
Branch of Service	
Army	64441 (45.9)
Air Force	34322 (24.4)
Navy	30559 (21.7)
Marines	11211 (8.0)
Child resides within Military Treatment Facility Service Area: within 20 miles of outpatient clinic	104496 (74.4)
TRICARE region of child residence	

Characteristics at Time Child Met Criteria ^b	N (%)
North	46530 (33.1)
South	30739 (21.9)
West	62626 (44.6)
Outside of the Continental US (OCONUS) ^d	638 (0.5)
Rank of Military Parent	
Junior Enlisted (E1–E4)	12702 (9.0)
Senior Enlisted (E5–E9)	61960 (44.1)
Officer	23295 (16.6)
Retiree	42576 (30.3)
Military Parent's marital status	
Married	127224 (90.5)
Divorced	9861 (7.0)
Never married	3224 (2.3)
Other	224 (0.2)
Family a part of the ECHO program	7860 (5.6)
Number of children with chronic conditions associated with the same military parent	
1	111582 (79.4)
2	24318 (17.3)
3	4633 (3.3)
Number of child dependents associated with the same military parent	
1 (child with chronic conditions only)	27954 (19.9)
2	53330 (37.9)
3+	59249 (42.2)

Abbreviations: ECHO = Extended Care Health Options.

^aChronic conditions were defined as having at least 1 inpatient or 2 outpatient diagnoses within the qualifying condition category, and having made at least 2 visits to a specialty care physician for any reason within FY 2011.

^bBased on month child met criteria for first chronic condition unless otherwise specified.

^cRace/ethnicity of military parent reported because the race/ethnicity of the child and other dependents is frequently not reported.

^dIncludes Pacific, Europe, West Pacific/Asia, Central/South America and Alaska.

Table 2

Number and percentage of Co-occurring chronic conditions among children with chronic conditions of military parents in FY 2011 (N = 140,533).

Chronic Conditions ^a	Number (%) of children in sample	Number (%) had at least one comorbid ^b chronic condition	Top 3 comorbid chronic conditions (% of children with chronic condition)
Attention Deficit Hyperactivity Disorder (ADHD)/conduct disorders	57885 (41.2)	42016 (72.6)	Other BH Disorders (42.6) Autism Spectrum Disorder (ASD) (19.3) Asthma (14.6)
Other Behavioral Health (BH) Disorders ^c	42755 (30.4)	35275 (82.5)	ADHD/conduct disorders (57.7) Autism Spectrum Disorder (ASD) (17.7) Arthritis (16.1)
Asthma	35541 (25.3)	23007 (64.7)	ADHD/conduct disorders (23.7) Arthritis (18.8) Other BH Disorders (18.2)
Arthritis	33475 (23.8)	21047 (62.9)	Other BH Disorders (20.6) ADHD/conduct disorders (20.6) Asthma (19.9)
Heart Problems	20029 (14.3)	16042 (80.1)	Other BH Disorders (24.4) Asthma (24.4) ADHD/conduct disorders (24.3)
Migraine/Headaches	18280 (13.0)	16134 (88.3)	Other BH Disorders (33.4) Arthritis (31.1) ADHD/conduct disorders (29.5)
Autism Spectrum Disorder (ASD)	18276 (13.0)	16830 (92.1)	ADHD/conduct disorders (61.2) Other BH Disorders (41.5) Developmental Delay/Intellectual Disability or Down Syndrome (32.3)
Developmental Delay and Intellectual Disability or Down Syndrome	16784 (11.9)	15329 (91.3)	ADHD/conduct disorders (44.5) Autism Spectrum Disorder (ASD) (35.2) Other BH Disorders (24.3)
Epilepsy/Seizures	11158 (7.9)	9044 (81.1)	Developmental Delay/Intellectual Disability or Down Syndrome (30.3)

Chronic Conditions ^a	Number (%) of children in sample	Number (%) had at least one comorbid ^b chronic condition	Top 3 comorbid chronic conditions (% of children with chronic condition)
Blood Problems	7418 (5.3)	6662 (89.8)	ADHD/conduct disorders (26.3) Head Injury (22.9) Head Injury (31.8) Asthma (27.9) Other BH Disorders (24.7) Migraine/Headaches (35.4) Arthritis (31.3) ADHD/conduct disorders (24.0) Other BH Disorders (23.4) ADHD/conduct disorders (20.7) Arthritis (20.4) Head Injury (29.4) Asthma (28.8) Developmental Delay/Intellectual Disability or Down Syndrome (19.8)
Head Injury	4246 (3.0)	3653 (86.0)	
Diabetes	3444 (2.5)	2303 (66.9)	
Cystic Fibrosis or Muscular Dystrophy	799 (0.6)	595 (74.5)	

^aChronic conditions were defined as having at least 1 inpatient or 2 outpatient diagnoses within the qualifying condition category, and having made at least 2 visits to a specialty care physician for any reason within FY 2011.

^bComorbid conditions required at least 1 inpatient or 2 outpatient diagnoses within the qualifying condition in FY 2011.

^cOther Behavioral Health Disorders includes anxiety, depression, bipolar, and psychotic disorders.

Table 3

Characteristics of children with chronic conditions in FY 2011, by comorbid chronic condition and behavioral/physical health condition type (N = 140,533).

Chronic Conditions	Number of Children	Child is Male	Child Age			Military Parent Branch of Service			Rank of Military Parent			Officer	Retiree
			0-5	6-11	12-18	Air Force	Army	Marine	Navy	Junior Enlisted	Senior Enlisted		
	N (%)	%	%	%	%	%	%	%	%	%	%	%	%
Any chronic condition	140533 (100.0)	58.2	15.7	33.6	50.7	24.4	45.9	8.0	21.7	9.0	44.1	16.6	30.3
Comorbid Chronic Condition													
No other chronic condition	62153 (44.2)	56.6	18.2	33.5	48.3	25.0	45.1	8.1	21.8	8.8	43.6	17.8	29.8
Yes, at least one other chronic condition	78380 (55.8)	59.5	13.8	33.6	52.6	24.0	46.4	7.9	21.7	9.2	44.5	15.6	30.7
By Type													
Behavioral Health only ^a	48144 (34.3)	65.5	9.7	43.4	46.9	22.6	46.9	7.9	22.6	9.1	46.8	16.4	27.7
Physical Health only ^b	53322 (37.9)	51.2	22.4	25.8	51.8	26.6	44.3	8.2	20.8	8.7	41.2	18.0	32.0
Both Behavioral Health & Physical Health	39067 (27.8)	58.8	13.9	32.1	54.0	23.6	46.7	7.7	21.9	9.4	44.7	14.9	31.1

^aBehavioral health conditions include: autism spectrum disorder; attention deficit hyperactivity disorder (ADHD)/conduct disorders; developmental delay and intellectual disability or Down syndrome; and other behavioral health disorders (anxiety, depression, bipolar and psychotic disorders).

^bPhysical health conditions include: arthritis; asthma; blood problems; cystic fibrosis or muscular dystrophy; diabetes; epilepsy/seizures; head injury; heart problems; and migraine/headaches.

Table 4

12 Month Healthcare Utilization^a among Children with Chronic Conditions identified in FY2011 (N = 140533).

Chronic Conditions	Number of Children with Chronic Conditions	Mean number of outpatient visits ^{b,c}	Percent with any ED visits	Mean number of ED Visits	Percent with any inpatient stays	Mean number of inpatient stays ^b	Mean length of all inpatient stays in days	Percent with any non-psychotropic prescriptions	Mean number of non-psychotropic prescription claims ^b	Percent with any psychotropic prescriptions	Mean number of psychotropic prescription claims ^b
Any Chronic Condition	140533	27.9	63.4	4.6	12.1	1.7	18.1	88.5	12.1	47.9	9.4
Comorbid Chronic Condition											
No other Chronic Condition	62153	19.8	56.4	3.9	6.0	1.4	8.0	85.0	10.1	34.0	7.8
Yes, at least one other Chronic Condition	78380	34.2	69.0	5.0	16.9	1.8	20.9	91.3	13.5	58.9	10.2
By Type											
Behavioral Health only ^d	48144	26.3	53.7	4.8	7.8	1.5	22.6	79.8	7.6	74.2	10.2
Physical Health only ^e	53322	21.5	65.5	3.9	10.0	1.6	8.9	92.4	13.4	10.3	3.0
Both Behavioral Health & Physical Health	39067	38.4	72.6	5.2	20.1	1.9	22.1	94.1	15.0	66.7	9.7

Abbreviations ED = emergency department.

^a All healthcare utilization is accrued during the 12 month period starting with the date of first diagnosis qualifying as a chronic condition in FY 2011.

^b The denominator for means is restricted to children with at least some utilization in the identified category.

^c Outpatient visits exclude emergency department visits.

^d Behaviora health conditions include: autism spectrum disorder; attention deficit hyperactivity disorder (ADHD)/conduct disorders; developmental delay and intellectual disability or Down syndrome; and other behavioral health disorders (anxiety, depression, bipolar and psychotic disorders).

^e Physical health conditions include: arthritis; asthma; blood problems; cystic fibrosis or muscular dystrophy; diabetes; epilepsy/seizures; head injury; heart problems; and migraine/headaches.

Table 5

Multivariate regression models of healthcare utilization^a by child, military parent, and family environment characteristics for children with chronic conditions in FY 2011.

Characteristics	Model 1: Logistic Regression for any Inpatient Stay AOR (95% CI)	Model 2: Linear Regression for Number of Outpatient Visits ^b Estimates (95% CI)	Model 3: Linear Regression for Number of ED Visits Estimates (95% CI)	Model 4: Linear Regression for Number of Non-Psychotropic Prescriptions Estimates (95% CI)	Model 5: Linear Regression for Number of Psychotropic Prescriptions Estimates (95% CI)
Condition Type					
PH ^C only (ref.)	1.00	0.00	0.00	0.00	0.00
BH ^d only	0.88 (0.84,0.92) *	2.50 (2.17,2.82) *	-0.17 (0.24,0.11) *	-6.40 (-6.55,-6.25) *	6.79 (6.71,6.87) *
BH & PH	2.40 (2.31,2.50) *	13.26 (12.92,3.59) *	1.04 (0.97,1.11) *	1.51 (1.36,1.67) *	5.80 (5.71,5.88) *
Child's Sex					
Male (ref.)	1.00	0.00	0.00	0.00	0.00
Female	1.24 (1.20,1.28) *	2.29 (2.02,2.56) *	0.26 (0.20,0.31) *	1.14(1.02,1.27) *	-0.52 (-0.59,-0.45) *
Age of Child With Chronic Condition					
0-5 (ref.)	1.00	0.00	0.00	0.00	0.00
6-11	0.38 (0.36,0.40) *	-9.03 (-9.44,-8.61) *	-0.67 (-0.75,-0.58) *	-2.19 (-2.39,-2.00) *	2.27 (2.16,2.38) *
12-18	0.70 (0.67,0.73) *	-8.87 (-9.28,-8.46) *	-0.54 (-0.63,-0.46) *	-3.39 (-3.59,-3.20) *	2.96 (2.86,3.07) *
Military Parent's Sex					
Male (ref.)	1.00	0.00	0.00	0.00	0.00
Female	1.09 (1.03,1.16)	-1.74 (-2.24,-1.24) *	0.55 (0.45,0.65) *	-0.38 (-0.61,-0.14)	-0.18 (-0.31,-0.05)
Race/ethnicity of Military Parent					
Non-Hispanic White (ref.)	1.00	0.00	0.00	0.00	0.00
Non-Hispanic Black	1.09 (1.04,1.14)	-2.71 (-3.10,-2.33) *	0.19 (0.11,0.27) *	-0.04 (-0.22,0.14)	-1.11 (-1.21,-1.01) *
Asian/Pacific Islander	1.01 (0.94,1.09)	-1.50 (-2.12,-0.89) *	0.41 (0.29,0.54) *	0.14 (-0.14,0.43)	-0.10 (-0.26,0.06)
Hispanic	0.98 (0.92,1.04)	-1.62 (-2.11,-1.12) *	0.28 (0.18,0.38) *	-0.30 (-0.53,-0.07)	-0.94 (-1.07,-0.81) *
AI/AN	1.02 (0.86,1.22)	-1.21 (-2.65,0.24)	0.05 (-0.25,0.34)	0.39 (-0.29,1.07)	0.19 (-0.19,0.57)
Other	1.14 (1.05,1.23)	-0.37 (-1.05,0.30)	0.21 (0.07,0.34)	0.09 (-0.22,0.41)	-0.24 (-0.42,-0.06)
Marital Status of Military Parent					
Never Married (ref.)	1.00	0.00	0.00	0.00	0.00

Characteristics	Model 1: Logistic Regression for any Inpatient Stay AOR (95% CI)	Model 2: Linear Regression for Number of Outpatient Visits β Estimates (95% CI)	Model 3: Linear Regression for Number of ED Visits Estimates (95% CI)	Model 4: Linear Regression for Number of Non-Psychotropic Prescriptions Estimates (95% CI)	Model 5: Linear Regression for Number of Psychotropic Prescriptions Estimates (95% CI)
Married	0.89 (0.80,0.98) *	-0.40 (-1.30,0.50)	0.49 (0.31,0.67) *	0.10 (-0.32,0.52)	-0.35 (-0.59,-0.12)
Divorced	1.01 (0.90,1.14)	-0.52 (-1.52,0.48)	0.13 (-0.07,0.33)	0.06 (-0.41,0.53)	-0.24 (-0.50,0.02)
Other	1.57 (1.10,2.24)	1.92 (-1.46,5.31)	0.40 (-0.29,-1.08)	0.21 (-1.37,1.80)	-0.10 (-0.99,0.79)
Branch of Military Parent					
Army (ref.)	1.00	0.00	0.00	0.00	0.00
Air Force	0.94 (0.90,0.98)	1.62 (1.27,1.96) *	-0.59 (-0.66,-0.52) *	-0.54 (-0.70,-0.38) *	-0.12 (-0.21,-0.03)
Marines	0.95 (0.90,1.02)	1.46 (0.95,1.97) *	-1.10 (-1.20,-1.00) *	-0.98 (-1.22,-0.75) *	-0.09 (-0.22,0.04)
Navy	0.99 (0.94,1.03)	1.35 (1.00,1.70) *	-0.48 (-0.55,-0.41) *	-0.40 (-0.57,-0.24) *	-0.11 (-0.20,-0.02)
Rank of Military Parent					
Junior Enlisted (ref.)	1.00	0.00	0.00	0.00	0.00
Senior Enlisted	0.77 (0.73,0.81)	0.93 (0.43,1.42) *	-0.71 (-0.81,-0.61) *	0.27 (0.04,0.50)	-0.16 (-0.29,-0.03)
Officer	0.58 (0.54,0.62) *	3.07 (2.51,3.63) *	-0.84 (-0.96,-0.73) *	0.14 (-0.13,0.40)	-0.58 (-0.73,-0.43)
Retired	0.66 (0.62,0.70) *	3.45 (2.91,4.00) *	-1.51 (-1.62,-1.40) *	1.36 (1.10,1.61) *	0.39 (0.25,0.53) *
Family a participant in ECHO program					
No (ref.)	1.00	0.00	0.00	0.00	0.00
Yes	1.65 (1.55,1.76) *	56.36 (55.77,56.96) *	2.56 (2.44,2.68) *	5.44 (5.17,5.72) *	-0.30 (-0.45,-0.14) *
Number of Children with Chronic Conditions associated with family					
1 only (ref.)	1.00	0.00	0.00	0.00	0.00
2	0.86 (0.82,0.90)	0.88 (0.53,1.22) *	0.12 (0.05,0.19) *	1.05 (0.89,1.22) *	0.85 (0.76,0.94) *
3+	0.86 (0.78,0.95)	1.69 (0.95,2.42) *	0.13 (-0.02,0.28)	1.75 (1.41,2.10) *	1.94 (1.75,2.14) *
TRICARE Region of Child Residence					
West (ref.)	1.00	0.00	0.00	0.00	0.00
North	0.82 (0.79,0.86) *	-1.07 (-1.37,-0.76) *	-0.06 (-0.12,0.01)	0.33 (0.18,0.47) *	0.45 (0.37,0.53) *
South	0.78 (0.74,0.81) *	-0.67 (-1.01,-0.32) *	-0.86 (-0.93,0.79) *	0.58 (0.42,0.74) *	0.40 (0.31,0.49) *
OCONUS	1.55 (1.26,1.91) *	-4.39 (-6.34,-2.44) *	3.15 (2.76,3.54) *	-0.34 (-1.25,0.57)	0.24 (-0.27,0.75)
Child Resides inside PRISM					
No (ref.)	1.00	0.00	0.00	0.00	0.00

Characteristics	Model 1: Logistic Regression for any Inpatient Stay AOR (95% CI)	Model 2: Linear Regression for Number of Outpatient Visits ^b Estimates (95% CI)	Model 3: Linear Regression for Number of ED Visits Estimates (95% CI)	Model 4: Linear Regression for Number of Non-Psychotropic Prescriptions Estimates (95% CI)	Model 5: Linear Regression for Number of Psychotropic Prescriptions Estimates (95% CI)
Yes	0.98 (0.94,1.02)	-2.15 (-2.45,-1.84) [*]	2.07 (2.01,2.13) [*]	0.56 (0.42,0.70) [*]	-0.49 (-0.57,-0.41) [*]

^{*} $p < .001$.

Abbreviations AOR = adjusted odds ratios; CI = confidence interval; ED = emergency department; PH = physical health; BH = behavioral health; AI/AN = American Indian/Alaskan Native; ECHO = Extended Care Health Options; OCONUS=Outside the Continental US; PRISM=Planning Tool for Resource Integration, Synchronization, and Management.

^a All healthcare utilization is accrued during the 12 month period starting with the date of first diagnosis qualifying as a chronic condition in FY 2011.

^b Outpatient visits exclude emergency department visits.

^c Physical health conditions include: arthritis; asthma; blood problems; cystic fibrosis or muscular dystrophy; diabetes; epilepsy/seizures; head injury; heart problems; and migraine/headaches.

^d Behavioral health conditions include: autism spectrum disorder; attention deficit hyperactivity disorder (ADHD)/conduct disorders; developmental delay and intellectual disability or Down syndrome; and other behavioral health disorders (anxiety, depression, bipolar and psychotic disorders).