



Original article

The Effect of Geographic Moves on Mental Healthcare Utilization in Children

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A B S T R A C T

Purpose: Geographic moves have been reported to have a negative impact on the mental health of children, but it is often difficult to separate the effect of the move from the circumstances that impelled it. Military populations may offer a way to examine this issue. Moves are common in military families, but parental employment and healthcare coverage remain constant.

Methods: Children of military parents with geographic moves in 2008 were compared with those without geographic moves with regard to the odds of mental health service use in 2009.

Results: This study included 548,336 children aged 6–17 years, and 179,486 (25%) children moved in 2008. Children aged 6–11 years with a geographic move had higher odds of mental health and outpatient visits (odds ratio [OR] 1.03; 95% confidence interval [CI] 1.01–1.06). Children aged 12–17 years with a geographic move had higher odds of mental outpatient visits (OR 1.04; 95% CI 1.01–1.07), psychiatric hospitalizations (OR 1.19; 95% CI 1.07–1.32), and emergency psychiatric visits (OR 1.20; 95% CI 1.07–1.32).

Conclusion: Children with a geographic move in the previous year have increased odds of mental health encounters. Among adolescents, this increase extends to psychiatric hospitalizations and emergency visits.

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IMPLICATIONS AND
CONTRIBUTION

This is the first military population-based study looking at the effects of geographic moves on mental health utilization in children. Our results suggest that recent geographic moves may lead to acute mental health problems in youth. Child healthcare providers should consider recent geographic moves during routine visits.

The United States is an extremely mobile society. Thirty-five million Americans had a geographic move between 2010 and 2011, that is, 10.6% of the population [1]. This can put a strain on families. High rates of residential change are associated with behavioral problems and increased risk taking in children [2]. Case–control studies have suggested that geographic moves may

be associated with increased rates of suicide [3,4]. Other mental health issues such as anxiety [5] and drug use [6] are also increased after geographic moves.

It is unlikely that moving affects all children the same way. Fisher et al. [7] found that a history of previous mobility is associated with less homesickness when students first go away to college. Military families typically are required to move more often than the national average, yet children from military families have been reported to have less risk-taking behaviors than what is reported in other national surveys [8]. Military parents have also reported that behavior in their children improves with frequent moves [9], and researchers have found that military children who relocate frequently have improved social competence [10].

Although military families move often, their situation is unusual in that at least one parent is sure to be maintaining his or her job, and the family's healthcare coverage remains the same. It could be that economic or health instability drives both the

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moves themselves and mental health problems in children. In situations such as the military, where the economics are stable, moving might not be detrimental. Previous studies that examined this in military families, however, have relied on surveying military parents and had relatively low participation rates [9,10]. This could have led to sampling bias. It also says little about formal mental health diagnoses or healthcare use. Having more objective information if military children who move are at an increased risk for mental health visits could provide a useful means to study the essential effect of moving on mental health in children.

To accomplish this, we examined the effect of geographic mobility in the fiscal year 2008 on the rate of mental health service use by military children in the fiscal year 2009. We specifically examined this effect on the type of mental health service (outpatient, emergency room, or inpatient) and on the mental diagnoses coded for at these visits.

Methods

This study is a retrospective cohort study, employing de-identified administrative records from the Military Health System (MHS) Medical Data Repository between October 1, 2006 and September 30, 2009. This study received Institutional Review Board approval from the Uniformed Services University of the Health Sciences.

The study sample included all children of the U.S. active duty service members who were between the ages of 6 and 17 years on October 1, 2008, and were MHS beneficiaries for the entire period of data collection. The study excluded children of activated members of the Reserves and National Guard as this population also utilizes other means of health insurance through civilian employers even when on active duty. The study excluded any children with missing data during the period of data collection. This included <1% of our original sample. Finally, the study excluded any children identified as having two active duty parents because the child's data are only linked to one of the parents through their medical record number in the Medical Data Repository. Children with two active duty parents accounted for approximately 5% of our original sample.

Children in the study were divided into two cohorts based on age. Group one, aged 6–11 years, generally follows Piaget's concrete operational stage of cognitive development and prepubescence. The second group, aged 12–17 years, generally follows Piaget's formal operational stage of cognitive development and after the onset of puberty.

Exposure was defined as at least one geographic move by the military child during the fiscal year 2008. This was determined by a change in the catchment area for healthcare coverage within the MHS. Codes are assigned representing 20-mile radius areas around either a military inpatient facility or ambulatory clinic. For areas outside a 20-mile radius from these facilities, a separate code is assigned for the entire state of residence. Of note, individuals who changed addresses but who did not change military treatment areas would not be counted as a geographic move for this purpose. In effect, this means that geographic moves were only considered when a child moved from one city or town to another.

An outcome was defined as at least one MHS-funded mental healthcare service for a child where the primary diagnosis is included in the Major Diagnostic Category 19 or 20 of the *International Statistical Classification of Diseases, Clinical Modification*,

during the fiscal year 2009. MHS-funded mental healthcare services include all outpatient, inpatient, and emergency visits within the MHS direct care system or reimbursed through Tri-care. The various mental health diagnostic groups were created using the Agency for Healthcare Research and Quality Clinical Classification Software for *International Statistical Classification of Diseases, Clinical Modification*.

Other data elements collected on the child include gender, age, and psychiatric history in the fiscal year 2007. Gender, age, race, marital status, rank, service branch, deployment history, and psychiatric history were collected on the active duty parent. Race of the active duty parent was used as a proxy for the race of the child since data on race in the child were not consistently collected. Gender, age, and psychiatric history were collected on the civilian parent. Psychiatric history was defined as at least two outpatient clinic visits or one inpatient admission with a primary mental health diagnosis in the fiscal year 2007.

Unadjusted odds ratios (ORs) were calculated to predict the odds of a mental health outpatient visits, emergency department visits, or hospitalizations based on if a child had experienced a geographic move the year before. Unadjusted ORs were also calculated for having a visit of any kind for the following diagnostic categories: adjustment disorders (adjustment), alcohol-related disorders (alcohol), anxiety disorders (anxiety), attention-deficit/conduct/disruptive behavior disorders (attention/conduct), developmental disorders (developmental), impulse control disorders (impulse), mood disorders (mood), personality disorders (personality), psychotic disorders (psychotic DO), substance-related disorders other than those involving alcohol (substance), suicidality or self-injury (suicide, self-injury), other mental health diagnoses typically diagnosed in childhood (child DO), and mental health diagnoses not otherwise classified (miscellaneous). Adjusted ORs were then calculated by creating logistic regression models to correct previous mental health and the demographics of the child and parents. SAS 9.2 software (SAS Institute Inc, Cary, NC) was used for all statistical calculations in this study.

Results

Information was available for 548,366 children of military parents. Of them, 24.9% had moved in 2008. Demographics of the children and their military and nonmilitary parents are listed in Table 1.

In regression modeling, age, gender, race, psychiatric history, parental psychiatric history, rank of active duty parent, branch of military service, and geographic move were all significant ($p < .05$) predictors of outpatient and emergency department mental health visits. All these except gender were also significant predictors of psychiatric hospitalizations. In general, White race, Army parent, lower rank, and personal or parental psychiatric history were predictive of more psychiatric visits of all kinds. Not surprisingly, a personal psychiatric history was the most powerful overall predictor (OR for outpatient visits: 12.44; 95% confidence interval 12.19–12.70). Boys were more likely to have an outpatient psychiatric visit but less likely than girls to visit the emergency department for mental health reasons.

Unadjusted ORs indicated that children who had undergone a geographic move were significantly ($p < .05$) more likely to have mental health outpatient visits, emergency department visits, and psychiatric hospitalizations than those who had not moved. This was also true when ORs were adjusted for demographic and

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