Persistence of Mental Health Needs among Children Affected by Hurricane Katrina in New Orleans

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Abbreviations:
ADHD = attention deficit hyperactivity disorder
ODD = oppositional defiant disorder

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Abstract

Background: Hurricane Katrina made landfall in August 2005 and destroyed the infrastructure of New Orleans. Mass evacuation ensued. The immediate and long-lasting impact of these events on the mental health of children have been reported in survey research. This study was done to describe the nature of mental health need of children during the four years after Hurricane Katrina using clinical data from a comprehensive healthcare program. Medical and mental health services were delivered on mobile clinics that traveled to medically underserved communities on a regular schedule beginning immediately after the hurricane. Patients were self-selected residents of New Orleans. Most had incomes below the federal poverty level and were severely affected by the hurricane.

Methods: Paper charts of pediatric mental health patients were reviewed for visits beginning with the establishment of the mental health program from 01 July 2007 through 30 June 2009 (n = 296). Demographics, referral sources, presenting problems, diagnoses, and qualitative data describing Katrina-related traumatic exposures were abstracted. Psychosocial data were abstracted from medical charts. Data were coded and processed for demographic, referral, and diagnostic trends.

Results: Mental health service needs continued unabated throughout this period (two to nearly four years post-event). In 2008, 29% of pediatric primary care patients presented with mental health or developmental/learning problems, including the need for intensive case management. The typical presentation of pediatric mental health patients was a disruptive behavior disorder with an underlying mood or anxiety disorder. Qualitative descriptive data are presented to illustrate the traumatic post-disaster experience of many children. School referrals for mental health evaluation and services were overwhelmingly made for disruptive behavior disorders. Pediatric referrals were more nuanced, reflecting underlying mood and anxiety disorders. Histories indicated that many missed opportunities for earlier identification and intervention.

Conclusions: Mental health and case management needs persisted four years after Hurricane Katrina and showed no signs of abating. Many children who received mental health services had shown signs of psychological distress prior to the hurricane, and no causal inferences are drawn between disaster experience and psychiatric disorders. Post-disaster mental health and case management services should remain available for years post-event. To ensure timely identification and intervention of child mental health needs, pediatricians and school officials may need additional training.

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Introduction

Hurricane Katrina made landfall along the US Gulf Coast on 29 August 2005, breaching the levees that protected New Orleans and flooding 80% of the city with water up to 25 feet deep. Katrina was followed by Hurricane Rita, which hit the Gulf Coast on 23 September 2005. New Orleans' infrastructure was disrupted, rendering parts of the city virtually uninhabitable. Especially affected were lowest-lying areas that had been home to the city's poorest, predominantly African-American residents.[1] The city's healthcare infrastructure was decimated. All but 19 of the 90 pre-hurricane primary care safety net clinics in New Orleans closed,[2] and the major provider of care to the city's poor and indigent, the Charity Hospital system, was destroyed.[3]

Male	Mean Age	Medicaid or CHIP	Uninsured	African-American	Hispanic	White
64%	9.5 years	71%	16%	55%	15%	27%

Table 1—Patient characteristics (n = 296; CHIP = State Children Heatlh Insurance Program)

In April 2006, it was estimated that 110,000 children in New Orleans, 85% of the population <18 years old, had left the city.[4] Studies documented the immediate and ongoing health and social needs of displaced and affected individuals in the Gulf Coast post-event.[5–7] A longitudinal, cohort study of randomly sampled displaced and impacted households showed that one year post-Katrina, 44% of Louisiana parents reported that at least one child in their household was experiencing new-onset behavioral or emotional problems.[7,8]

Days after Hurricanes Katrina and Rita, Children's Health Fund began a disaster-relief healthcare program using mobile clinics to bring health care to children and families in the most affected areas of New Orleans. A partnership was established with the Tulane University School of Medicine, and the program evolved into an integral part of the city's safety net providing comprehensive health care in a medical home model[9] using mobile clinics. Medical services were supplemented by a mobile mental health clinic beginning in July 2007 that was staffed by an inter-disciplinary team of two clinical social workers, a clinical counselor, and a part-time psychiatrist. Since few community-based mental health services were available after Katrina,[10] the mental health clinic almost immediately began to receive school and community referrals, as well as referrals from the primary care practice.

Methods

The clinical needs of pediatric patients of the mobile mental health clinic from its inception in July 2007 through June 2009 are described. The study was conducted by a manual, retrospective review of paper mental health charts for all patients <22 years of age (n = 296). Data points included date of birth, gender, race/ethnicity, insurance status, referral source, presenting problem, and diagnoses. Age was calculated as of June 30 of the calendar year of first visit. Parent reports of post-Katrina dislocation from the home and current housing status were recorded. Housing was considered "stable" if the family owned or rented an apartment or house, and "unstable" if the family was domiciled in a homeless shelter, trailer, or hotel, or was doubled up with relatives or friends. Qualitative data descriptions of patient experiences relative to Hurricane Katrina were recorded from histories taken as part of mental health evaluations. Psychosocial data also were abstracted from patient medical charts. Data were entered in Excel spreadsheets then were coded into categorical and dichotomous variables as appropriate for analysis in SPSS (Version 15.0, SPSS, Inc., Chicago, IL). Analyses were primarily descriptive (frequencies, cross-tabs with chi-square analysis). Pediatric patients who arrived with their families into New Orleans after Hurricane Katrina[11] were excluded.

Tulane University School of Medicine Institutional Review Board Protocol 140664-1, "New Orleans Children's Health Project Retrospective Chart Review" applies to this study.

Results

Mental health needs among children referred for evaluation and intervention were presented at a similar prevalence and intensity during the period covered by this study (from two years to nearly four years post-event). Mental health problems could be characterized as predominantly disruptive behavioral disorders with underlying mood and anxiety disorders.

The demographics of the population changed significantly during this period. The percentage of Hispanic patients increased and the percentage of African-American and white patients decreased ($p < 0.01$). Age and gender distribution did not change significantly. Patient demographic characteristics are detailed in Table 1.

In 2007, 37% of pediatric primary care patients had a psychosocial (developmental, mental health, or family) problem that required intervention. Housing was a major issue. Ninety-four percent of the children and families receiving mental health services reported having been dislocated by Hurricane Katrina, and 32% were unstably housed. Case management was essential to help families navigate the often bewilderingly complex maze of local, state, and federal assistance programs.[12,13] Fifty-five percent of pediatric patients receiving mental health services were referred for psychiatric evaluation. Most met diagnostic criteria for attention deficit hyperactivity disorder (ADHD) or oppositional defiant disorder (ODD);[14] however, most also had underlying or co-morbid mood, stress, and/or anxiety disorders. In many cases, their degree of agitation and disruptive behavior was such that psychotropic medication, typically stimulants sometimes in combination with adrenergic agonists, was required. Two children were diagnosed with pervasive developmental disorder and one with chronic tics. Several children referred for school behavior problems were diagnosed with a learning disability.

The nature of traumatic exposures experienced by children referred for mental health services is reflected in qualitative data abstracted from the 2007 mental health charts. Selected case vignettes are in Table 2.

In 2008, psychosocial issues in the primary care practice remained high at 29%. Nearly one in four (24%) mental health patients was in unstable housing, and 92% had been displaced from their home. About half of these patients had been referred from their school, predominantly for disruptive behavior problems.

During 2009, housing stability improved; however, presenting problems and diagnostic profiles of pediatric mental health patients were similar to those in previous years. On the mental health mobile clinic, the most prevalent primary diagnoses in 2009 were ADHD, ODD, and conduct disorders (71%); 29% had primary mood or anxiety disorders including two cases of post-traumatic stress disorder (PTSD). In 2009, a higher percentage of referrals related to family problems, including domestic violence, separation, and divorce, was noted.

Aggregate data for 01 July 2007 through 30 June 2009 show a significant difference emerged in the presenting problem based on referral source. Referrals from school officials were 84% for externalizing problems (disruptive behavior, short attention,

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○ An eight-year-old boy had been evacuated from floodwaters where he witnessed dead bodies floating by. He had persistent school problems while living in a Texas homeless shelter. After resettling in New Orleans, he was referred because of disruptive behavior in school.
○ A four-year-old girl who had been evacuated from New Orleans prior to the storm was separated from her parents for several weeks, during which details of her situation were unclear. She was referred from her preschool as an alternative to expulsion after she was reunited with her homeless family. It emerged that she recently had been prevented from setting her doll on fire.
○ Mental health referrals from pediatricians included a five-year-old with sleep disorder and panic attacks whose apartment and possessions were destroyed in the hurricane, and a four year old whose mother had died the year before the hurricane. Post-Katrina, she had nightmares and regressed functioning, and was diagnosed with PTSD.
○ A seven-year-old girl was rescued from the floodwaters by boat and placed in a shelter apart from her family. She had multiple cigarette burns when reunited with her family. In the first two years after the storm, she attended five different schools. Her symptoms included enuresis, hyperventilation, and self-injurious behavior. She was diagnosed with PTSD.
○ A seven-year-old previously diagnosed with PTSD following an automobile accident had spent five days after the hurricane in a hospital building without adequate food and water. He was evacuated to two different states. When he returned to New Orleans, he presented with nightmares and a depressive disorder.
○ Other features of this referred population included animal cruelty, multiple school expulsions, and fighting that required police intervention.

Table 2—Case vignettes from 2007 mental health patients (PTSD = post-traumatic stress disorder)

hyperactivity) and 16% for internalizing (mood and anxiety) problems. By comparison, referrals from pediatricians were more nuanced; 38% were for externalizing and 62% for internalizing problems ($p < 0.01$). Externalizing presenting problems also were significantly associated with referred males (81% vs. 59% female; $p < 0.01$), and with unstable housing (78% vs. 63%; $p < 0.05$). Sixty-nine percent of children referred from their schools were male. Displaced status was not significantly associated with type of presenting problem; it was ubiquitous in the population.

Discussion

Relationship to Other Studies

The persistence of mental health problems among children and youth in the years following Hurricane Katrina described in this study is consistent with other findings.[15] Data from programs providing federally funded disaster mental health services ("crisis counseling") up to 18 months post-Katrina indicated the persistence of need and atypically slow rate of recovery from disaster-related psychological distress after Hurricane Katrina.[16] A study using the Strengths and Difficulties Questionnaire found continuing symptoms consistent with psychiatric disorders in metropolitan New Orleans two years post-Katrina. Most were considered hurricane-related.[17] Survey data from children two years after the hurricane show that the most prominent predictors of the need for mental health services were displacement, separations from caregivers, and adverse shelter experiences,[18] all of which were seen in the current study population. The trauma histories described by these patients are consistent with those described in a 2009 study funded by the National Institute of Mental Health.[19]

Representativeness of the Sample

By design, the mobile clinic program served the high-risk and medically underserved communities most affected by Hurricane Katrina. Since Hurricane Katrina disproportionately impacted populations already experiencing health disparities and inadequate access to care, this population is considered to be representative of children most affected by Hurricane Katrina, but not of all children in New Orleans, or more generally, children affected by disasters in other locations.

While the population studied was limited to a single pediatric practice, data suggest that the findings are consistent with city-wide trends. After Hurricane Katrina, New Orleans school officials reported being overwhelmed by new-onset behavioral problems in their students.[20–22] At Louisiana school-based health centers during the 2007–2008 school year, mental health was second only to general preventive medicine as the reason care was sought.[23]

Implications for Practice

The data regarding referral trends are consistent with findings in other studies, e.g., from a system of mental health care in East Baltimore that found that school referrals predominantly were male and presented with physical aggression and attention deficits.[24] The higher percentage of referrals of children with mood and anxiety symptoms from health care rather than school settings suggests that pediatric providers may be better equipped to elicit these more difficult to detect symptoms or that parents and children may be more likely to disclose these symptoms in a primary care setting. However, studies of pediatrician knowledge of mental health conditions after the terrorist attacks of 11 September 2001 showed that pediatricians may require additional training to identify internalizing disorders.[25,26]

Many children had serious signs of psychopathology, including fire setting and animal cruelty, before becoming patients of this mobile clinic program and being referred for mental health services. In terms of post-event mental health planning, it is important that pediatricians and other primary care providers become better able to target children for referral and interventions based on "red flag" indicators that differentiate those in urgent need from children with typically occurring responses to atypically stressful situations.[27]

Limitations

A pre-disaster baseline for child mental health status was not available. As the program was created post-Katrina, there was no access to the population to assess service needs prior to the hurricane. No causal connection between specific traumatic exposures and diagnosed psychiatric disorders should be inferred from these data.

Another limitation is the nature of the data. The mental health conditions and traumatic exposures described were derived from chart review of a mental health-referred population. All data were recorded in the context of clinical care delivery rather than a structured research protocol. Standardized diagnostic tests were not used. Diagnoses were determined in the clinical setting by experienced clinicians according to DSM-IV-TR criteria. However, in

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most cases, diagnoses were confirmed by at least two differently credentialed mental health professionals; e.g., a psychiatrist and a licensed clinical counselor, thus minimizing possible bias.

Conclusions

Mental health needs persisted in New Orleans for at least four years after Hurricane Katrina among the vulnerable children and families who were directly affected by the event. For this high-risk population, psychosocial and psychiatric problems persisted after living conditions stabilized and periods of homelessness and dislocation resolved. As a matter of public health policy, mental health and case management services should continue to be made available to affected populations for years after an event such as Hurricane Katrina.

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