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Differences in Caregiver-Reported Health Problems and Health Care Use in Maltreated Adolescents and a Comparison Group from the Same Urban Environment

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Abstract

Maltreated youth have a high prevalence of acute and chronic mental and physical health problems, but it is not clear whether these problems are related to maltreatment or to a disadvantaged environment. To compare health status and health care use of maltreated youth receiving child protective services to comparison youth living in the same community, we conducted a secondary analysis of caregiver reports for 207 maltreated adolescents (mean age 11.9 years) and 142 comparison adolescents (mean age 12.3 years) living in urban Los Angeles, using questionnaire data from a larger longitudinal study framed in a socio-ecological model. Caregivers included biological parents, relatives, and unrelated caregivers. Analyses included *t*-test, MANOVA, chi-square, and multivariable logistic regression. Caregivers reported similar rates of physical health problems but more mental health problems and psychotropic medicine use in maltreated youth than in the comparison youth, suggesting that maltreated youths' higher rates of mental health problems could not be attributed to the disadvantaged environment. Although there were no differences in health insurance coverage, maltreated youth received preventive medical care more often than comparison youth. For all youth, having Medicaid improved their odds of receiving preventive health and dental care. Attention to mental health issues in adolescents receiving child welfare services remains important. Acceptance of Medicaid by neighborhood-based and/or school-based services in low-income communities may reduce barriers to preventive care.

Keywords

child maltreatment; child abuse; foster care; adolescent mental health; adolescent physical health; community social service

Child maltreatment is a serious problem that often results in both short- and long-term threats to health, well-being, and development. Around the globe, approximately 20% of women and between 5% to 10% of men report being sexually abused as children, and 25–50% of children report being physically abused (World Health Organization, 2010). In the US in 2011, there were 3.7 million reports of child maltreatment, of which 18.5% were substantiated (US Department of Health and Human Services [USDHHS], 2012). Types of maltreatment included neglect, physical abuse, sexual abuse, and psychological maltreatment. About 53% of these children received child welfare services; nearly 20% were placed in out-of-home foster care (nonrelative or kinship care) and 33% received in-home services, such as family preservation or family reunification interventions at home with one or both biological parents (USDHHS, 2012).

Maltreated youth have a high prevalence of acute and chronic mental and physical health problems, but it is not clear whether these problems are related to the maltreatment experience alone or also to the environment in which they live. Therefore, we compared caregivers' reports of health problems and use of health services in maltreated youth to those of comparison youth living in the same urban communities.

Health of Children in Foster Care

For more than three decades, research in this area has been focused primarily on the high prevalence of health problems in the foster care population. It is accepted that children and adolescents in foster care experience serious health disparities (American Academy of Pediatrics [AAP], 2002; Halfon, Mendonca, & Berkowitz, 1995; Jee et al., 2006; Schor, 1982). More children in foster care suffer from untreated acute illnesses, chronic conditions, and developmental and mental health problems than those in the general population (Jaudes, Bilaver, Goerge, Masterson, & Catania, 2004; Kortenkamp & Ehrle, 2002). Common medical problems include upper respiratory and skin infections, asthma, severe allergies, and more recently, obesity (Halfon et al., 1995; Hansen, Mawjee, Barton, Metcalf, & Joye, 2004; Schneiderman, Leslie, Arnold-Clark, McDaniel, & Xie, 2011; Steele & Buchi, 2008). These overall health problems are also common in adolescents in foster care (Kools, Paul, Jones, Monasterio, & Norbeck, 2013; Rubin, O'Reilly, Luan, & Localio, 2007).

Up to 80% of children and adolescents in foster care have serious mental health problems (Kerker & Morrison Dore, 2006; McMillen et al., 2004; Rubin et al., 2007), compared to about 10% in the general child population (USDHHS, 2000).

Health Disparities and Health Care Use in Maltreated Children and Adolescents

More maltreated children served by child welfare actually remain with their biological parents than enter foster care (Barth, 2009). Maltreated children who live at home have physical health, mental health, and developmental problems at rates similar to those in foster care (Leslie et al., 2005; Mennen, Brensilver, & Trickett, 2010), although maltreated children's physical and mental health problems persist and worsen with longer stays in foster care and multiple placements (Rubin et al., 2007).

Maltreated children, regardless of placement history, have poorer health than children in the general US population (Ringeisen, Casanueva, Urato, & Cross, 2008). Between 13% and 19% of all children are estimated to have special health care needs (Bethell, Read, Blumberg, & Newacheck, 2008). In contrast, of the 2 million maltreated children receiving services from the child welfare system in the US today, 50% have special health care needs, and 30% have chronic health conditions (Ringeisen et al., 2008).

Given the physical and mental health problems among children and adolescents served by child welfare, pediatric health care utilization is high, yet remains insufficient to meet their needs (AAP, 2005; Halfon et al., 1995; Jaudes et al., 2004; Leslie et al., 2005). Many of these children receive limited preventive care, such as well-child visits and dental care (Kortenkamp & Ehrle, 2002). Further, despite similar patterns of mental health functioning across placement type, children in kinship care (Leslie et al., 2005) and those living at home receive less mental health care than those living in nonrelative placements (Burns et al., 2004; Kortenkamp & Ehrle, 2002; Mennen et al., 2010). The Urban Institute, researchers found that 32%–66% of US child welfare-involved children (across all types of living arrangements) with high levels of behavioral problems received no mental health care (Kortenkamp & Ehrle, 2002).

Adolescent Health in the Child Welfare System

Although nearly 32% of individuals served by child welfare and 42% of the foster care population in the US are adolescents ages 10–18 (USDHHS, 2011, 2012), they have rarely been studied as a distinct population in child welfare research. Although adolescence is typically a healthy time, there are disparities in outcomes among racial and ethnic minorities, males, older adolescents, those with less income, and those with unique vulnerabilities, such as young people in the foster care and juvenile justice systems (English, Park, Shafer, Kreipe, & D'Angelo, 2009; Marcell, Kleen, Fischer, Allan, & Kokotailo, 2002; Zimmer-Gembeck, Alexander, & Nystrom, 1997). Thus, adolescent health has been identified as a priority area in the Healthy People 2020 initiative (USDHHS, 2013). Adolescence has specific stage-related health behaviors and risks, such as substance use and sexual experimentation. It is also a time in which health behaviors with potential for long-term impact on health in adulthood are established, such as smoking or poor eating habits.

Maltreatment and other adverse childhood experiences can manifest in internalizing and externalizing types of mental health problems in adolescents (Mills et al., 2013), including

depression and suicidality (Dunn, McLaughlin, Slopen, Rosand, & Smoller, 2013), anxiety and post-traumatic stress disorder (Cutajar et al., 2010), and aggressive, delinquent, and violent behavior (Gilbert et al., 2009). Health risk behaviors that arise in adolescence, such as substance abuse and risky sexual behaviors leading to sexually transmitted infections and unintended pregnancy, also are higher in child welfare-involved youth (Leslie et al., 2010). It is important to identify child welfare-involved adolescents' unique health problems, access-to-care issues, and factors that contribute to both.

Access to Health Care

In an effort to ameliorate the health disparities experienced by children served by child welfare, the AAP (2005) and the Child Welfare League of America (CWLA; 2007) established standards for these children's health care to ensure appropriate assessments, interventions, and continuity of care. These include rigorous and periodic physical and mental health assessment, development of an individualized health care plan, frequent health maintenance visits and follow-up, and systematic health recordkeeping. Health care utilization, however, remains impeded by barriers to access. These barriers are predominantly systemic and include insurance issues (e.g., delays in insurance coverage with foster care placement and moves, low reimbursement rates), poor health recordkeeping and tracking across placements, and poor communication between providers across child-serving systems (Kools & Kennedy, 2003).

The Social Ecological Model of Health Behavior

The main hypothesis of the social ecological model is that the environment and structural factors within the environment are critical determinants of individual and family health behaviors (Cohen, Scribner & Farley, 2000). The focus is on the environmental context of behavior, including community and organizational factors, while incorporating social and psychological influences, such as intrapersonal and interpersonal factors (Robinson, 2008; Sallis, Owen, & Fisher, 2008). The socio-ecological approach can be used to address the environmental influences on health behavior, including both health service use and preventive everyday health activities, such as eating well, getting adequate sleep, and exercising, all of which can prevent illness and influence health outcomes.

Within the same community, many of the environmental factors, including community and organizational structures, are similar for the residents of that geographical area, while the social and psychological factors may differ. Families in this study differed primarily on one aspect of the latter, the reported maltreatment status of the youth, which could influence other intrapersonal and interpersonal factors, such as the adolescent's stress level as well as stressful interactions within the family. Other individual and family risk factors also may differ between the maltreated and comparison families, such as insurance status and income. It is not clear, however, whether the adolescent's maltreatment experience is the overarching determinant of health behaviors.

A clear understanding of how child maltreatment may affect health needs and health care access for adolescents in low income neighborhoods will assist pediatric advance practice nurses, community health nurses, emergency room nurses, school nurses and other health

care workers who care for vulnerable young people. Thus, the purpose of this study was to examine within a given environment, represented by the similar geographical location of the families, whether maltreatment, both an intra- and interpersonal factor, was the primary risk factor for health disparities as reported by caregivers of maltreated adolescents, after controlling for other individual and family risk factors. We hypothesized that the maltreatment experience would be the primary risk factor for health disparities. We expected that the caregivers' assessment of the adolescents' health problems, difficulty caring for the child due to health status, and health service use would be higher in the maltreated sample than in comparison youth living in the same environment.

Methods

Design

To test our hypothesis, a cross-sectional secondary analysis of data collected as part of a longitudinal study of the effects of maltreatment on adolescent development (Mennen & Trickett, 2007) was conducted. We compared the caregivers' reports of health problems and health care utilization of maltreated adolescents to adolescents in the same low-income neighborhoods who may have experienced similar adversities, such as economic disadvantage, single parenthood, and poor neighborhood resources, but had not been reported to child welfare for experiencing abuse or neglect.

Analyses were done to answer the following questions: (1) Are there differences between caregivers' reports of health status, medication use, and health care use of maltreated versus comparison youth? (2) Do child intrapersonal and interpersonal characteristics (age, sex), family characteristics (household income, insurance type, caregiver's age, and caregiver ethnicity), and maltreatment status of the child affect caregivers' reports of the youth's health status, parenting difficulty due to youth's health status, or youth's health service use?

Recruitment and Data Collection for the Larger Study

Maltreated youth and their caregivers were recruited into the larger longitudinal study from active cases referred to researchers by the Los Angeles County Department of Children and Family Services (DCFS). The department referred cases monthly that met the following recruitment criteria: (1) a new substantiated maltreatment referral to DCFS in the preceding month for any type of maltreatment; (2) child aged 9 to 12 years old; (3) child identified as African American, Latino, or White (non-Latino); and (4) child residing at the time of referral to DCFS in one of 10 zip codes in urban Los Angeles County. Zip codes were chosen using DCFS statistics on maltreatment rates of children of different ethnicities and census tract information on urban character and diversity of ethnicities. Comparison youth from the same age group, races/ethnicities, and zip codes were recruited from lists generated by a direct marketing firm, using the same recruitment criteria except for child maltreatment. Recruitment procedures were approved by the university's institutional review board, DCFS, and juvenile court. Potential participants' caregivers were contacted via postcard followed by a phone call and asked to indicate their willingness to participate.

Caregivers gave consent for their own participation in the study and, if they were guardians or birth parents, gave permission for their child's participation in the study. If the child was in foster care, the juvenile court provided permission. Youth gave assent to participate in the study. None of the comparison caregivers identified any previous or ongoing involvement with child welfare, which was confirmed by checking DCFS records. At baseline, 77% ($n = 303$) of caregivers of maltreated youth referred by DCFS and 50% ($n = 151$) of comparison caregivers agreed to participate.

Caregivers and adolescents came to the study office to participate in 3- to 4-hour interviews that included measures of multiple areas of functioning (for a complete description of the study protocol, see Gordis, Granger, Susman, & Trickett, 2006; Mennen & Trickett, 2007). The first assessment occurred between 2002 and 2005, and the second assessment that produced data for this secondary analysis occurred approximately 1 year later (2003–2006). At each interview, caregivers and children were given remuneration compatible with the National Institutes of Health's standard compensation rate for healthy volunteers.

Sample for Secondary Analysis

Data for the present analysis were among those collected at the second data collection point in the longitudinal study, which was approximately 1 year after the baseline assessment. The sample for this analysis was limited to adolescents who had lived with their current caregiver for at least 12 months, to assure the caregiver's ability to answer questions about the adolescent's health problems and health care use over the past year. Of the 250 caregivers of maltreated adolescents who completed the second assessment, 207 met this criterion, as did all 142 caregivers of comparison adolescents.

Measures

Demographics—Caregivers reported their age and race/ethnicity, as well as the gender, birth date (used to calculate age), and race/ethnicity of the child. Caregivers also answered questions regarding their income. Household income was a 4-level ordinal variable (1= *less than \$10,000*, 2= *\$10,000–\$19,000*, 3= *\$20,000–\$39,000*, 4= *\$40,000 or more*). Caregivers described how their child's medical needs were paid for; this information was categorized as “Medicaid” (Medi-Cal insurance, the name for Medicaid in California) or “other.”

Adolescent health problems and health care use—The symptoms and illnesses questions were adapted from a health update questionnaire from a previous study of sexually abused girls (Sickel, Noll, Moore, Putnam & Trickett, 2002). The adaptation included removal of questions not appropriate for adolescents.

Symptoms during the previous 30 days: Caregivers were asked whether the youth had seven symptoms (cough, earache, sore throat, headache, stomachache, other pain, trouble falling asleep) during the previous 30 days, using a 5-item scale of *never*, *almost never*, *sometimes*, *almost always*, and *always*. Symptoms were evaluated as (1) number of symptoms and (2) frequency of each symptom. For the former, symptoms were categorized as *no* if the youth did not experience the symptom and *yes* if the caregiver reported any instance of the symptom. The possible range for the number of symptoms was 0–7. For the

frequency measure, the symptoms were divided into three categories based on the type of health problem: colds (average score for ratings of cough, earache, and sore throat); pain (average score for ratings of headache, stomachache, other pain); and sleeping problems. Each of the three categories of symptoms had a range of 0–4 (0=*never*; 1=*almost never*; 2=*sometimes*; 3=*almost always*, and 4=*always*).

Illnesses during the previous 12 months: Caregivers were asked whether the youth had any of the following illnesses over the last year: 1) cold, 2) flu, 3) asthma, 4) sinus trouble, 5) tonsillitis, 6) ear infection, 7) stomachache with vomiting, diarrhea, or fever, 8) bronchitis, 9) skin infection, 10) pneumonia, and 11) bladder or urinary tract infection. The frequency of each illness type during the previous year was reported using a 5-point scale of *none, once, twice, three times, or four or more times*, which was dichotomized to none and one or more times and summed to provide an illness count for the previous year. The possible number of illnesses was between 0–11.

The eleven illnesses also were categorized into 5 categories based on body systems: respiratory (including cold, flu, bronchitis, asthma, and pneumonia); gastrointestinal (stomachache with vomiting, diarrhea, or fever); ear, nose, and throat (including sinus problems, tonsillitis, and ear infection); urinary (bladder or urinary tract infection); and skin infection. For the respiratory and ear, nose, and throat categories, the original scores for each illness were averaged to provide an average frequency for those illness categories, from 0 to 4 (0=*none*; 1=*once*; 2=*twice*; 3=*three times*; and 4=*four or more times*).

Medications: Caregivers listed up to three medications the youth was taking. A family nurse practitioner reviewed the medication lists and recommended categories. Based on these recommendations, medications were categorized as: allergy and antihistamines; asthma; acid reflux; cough and colds; pain and non-steroidal anti-inflammatory drugs; psychotropic; and other disorders. There was 100% agreement regarding the coding of medications between a family nurse practitioner and a pediatric nurse specialist.

Health care use: Caregivers identified whether or not the youth had a medical checkup or dental exam (excluding orthodontic exams) within the previous year.

Caregiver perceptions of youth's health—Caregiver ratings of the youth's physical and mental health were identified on a 4-point scale and dichotomized as *poor or fair* versus *good or excellent*. The caregivers also rated how difficult it was for them to care for the youth due to the youth's physical or mental health issues, and ratings on a 5-point scale were dichotomized as 0=*very easy or easy, neither easy nor difficult*, and 1=*difficult or very difficult*.

Analysis

T-test or one-way analysis of variance was used to compare the demographics of the maltreated and comparison groups' adolescents and caregivers. Due to correlations between dependent variables, Multivariate Analysis of Variance (MANOVA) was used to compare means of level of illnesses and symptoms. Separate models were run for past 30 days and past 12 months variables. Chi-square analysis was used to examine differences between

maltreated and comparison adolescents on types of medications, doctor or dentist visits during the previous 12 months, and caregivers' rating of health.

Multivariable logistic regression was employed to examine potential predictors of the outcomes of the health service use (medical check-up, dentist visit), caregiver rating of youth's overall health and mental health, and caregiver difficulty with caring for youth due to physical health or mental health. In each model, the predictors a) child characteristics (age, gender), b) family characteristics (household income, insurance type [Medicaid vs. all others], caregiver's age, and ethnicity [non-Latino White vs Minority]), and c) maltreatment status of the child were entered by variable group (a, b, c) in separate blocks in the order above. A separate model was run for each outcome variable of interest.

Results

Sample Description

The overall mean age of the youth was 12.08 years (*SD* 1.18); ages ranged from 10–15 years. Maltreated youth were slightly younger on average than comparison youth (11.9 versus 12.3 years, $p < .01$). Caregivers' age averaged about 40 years and did not differ between groups. Gender was balanced in the maltreated group (48.8% boys versus 51.2% girls), but there was a higher percentage of boys than girls in the comparison group (59.9% boys vs 40.1% girls). A large majority of caregivers and youth in both groups were racial or ethnic minorities. Maltreated adolescents lived with a variety of caregivers: 127 (61%) with a biological parent, 58 (28%) with a relative, and 22 (11%) with an unrelated caregiver, while comparison adolescents lived with a biological parent (94%) or a relative (6%). Household income was higher in comparison households than in households of maltreated youth. On a scale in which 1 = less than \$10,000, 2 = \$10,000–\$19,000, 3 = \$20,000–\$39,000, and 4 = \$40,000 or more, income averaged 1.97 (*SD* 1.06) in the maltreatment group households compared to 2.79 (*SD* 1.08) in the comparison group ($p < .05$). Further description of both groups can be found in Table 1.

The majority of youth in the sample as a whole had some form of health insurance, and the percentage of youth with insurance of some kind (Medicaid, private insurance, or health maintenance organization) did not differ by group, but Medicaid was more common in maltreated youth, and private insurance or HMO membership were more common in comparison youth. Only 23 caregivers (17% of adolescents without Medicaid; 7% of the total sample) either paid for health care out-of-pocket or did not identify a method of covering medical costs.

Health Status and Health Care in Maltreated and Comparison Youth

Maltreated youth averaged slightly fewer colds and aches and pains on average than did comparison youth in the past 30 days (see Table 2). There were no group differences in the caregivers' identification of illnesses during the last 12 months. Although there were no group differences for dentist visits, maltreated adolescents were more likely to have visited a doctor and to be on psychotropic medication than comparison adolescents, and more

caregivers of maltreated adolescents rated them to have poorer psychological health and reported more difficulty with the youth's psychological health from a parenting perspective.

Health Care Use

Maltreatment history did not predict medical or dental care use in the previous 12 months, but having Medicaid predicted both medical and dental care use. After controlling for caregiver age and ethnicity, household income, youth age, youth gender, and maltreatment status, adolescents with Medicaid were 2.17 times more likely to have visited a doctor than were youth with other types of insurance (95% CI = 1.01–4.64, $p = .04$; see Table 3). Being on Medicaid and having a higher income increased the likelihood of going to a dentist during the previous 12 months by 2.52 (95% CI = 1.21–5.27, $p = .01$) and 1.45 (95% CI = 1.08–1.95, $p = .02$), respectively, compared to adolescents without Medicaid coverage and adolescents with lower household income.

Minority caregivers were 74% less likely to have taken youth to the dentist in the past 12 months (95% CI = .08–.89, $p = .01$) compared to non-Hispanic White caregivers. Male youth were almost twice as likely as females to have had dentist visits (OR = 1.91, 95% CI = 1.06–3.46, $p = .03$). As a block, family characteristics (caregiver characteristics, income, and insurance) predicted both medical check-ups ($\chi^2 = 12.69$ (4), $p = .02$) and dental visits ($\chi^2 = 20.48$ (4), $p < .01$).

Being in the maltreated group increased the likelihood of caregiver-reported poor adolescent mental health by 2.58 (95% CI = 1.33–5.01, $\chi^2 = 8.20$ [1], $p = .01$) and the likelihood that mental problems led to parenting difficulty by 2.65 (95% CI = 1.27–5.52, $\chi^2 = 7.22$ [1], $p = .01$). Family characteristics as a block also predicted poor youth mental health ($\chi^2 = 19.15$ [4] and [1], respectively, $p < .01$). There were no significant predictors of caregiver-rated youth physical health or difficulty dealing with youths' physical health (Table 3).

Discussion

The primary difference between maltreated and comparison youths' caregiver-reported health problems was in the mental health arena. Not surprisingly, caregivers rated the mental health of maltreated youth as poor more than twice as often as caregivers of comparison youth, and more maltreated youth were taking psychotropic medications than comparison youth. The experience of maltreatment has been long associated with serious mental health consequences, including depression, anxiety, posttraumatic stress disorder, and borderline personality disorder (Child Welfare Information Gateway, 2013; Felitti & Anda, 2010). Abuse and neglect have been associated with antisocial behaviors such as aggression, truancy, and delinquency, as well as substance abuse and risky sexual behaviors (Gold, Wolan Sullivan, & Lewis, 2011; Messman-Moore, Walsh, & DiLillo, 2010).

Caregivers of maltreated youth in this study were more than twice as likely as were caregivers of comparison youth to report difficulty caring for the youth because of mental health problems. Serious emotional and behavioral problems among maltreated adolescents, often accompanied by emotion dysregulation and poor impulse control, may make parenting extremely difficult. Previous researchers have likewise underscored the caregiver burden

associated with parenting children with serious mental health problems (Kalra, Kamath, Trivedi, & Janca, 2008; Meltzer, Ford, Goodman, & Vostanis, 2011).

While the majority of both maltreated and comparison youth had health insurance, a higher percentage of had Medicaid than the comparison group. Comparison youth had other forms of health insurance, such as private insurance or coverage via health maintenance organizations, but youth in the maltreatment group were more likely to receive regular health medical check-ups than comparison adolescents, although there were no differences in receipt of dental visits. It is possible that the maltreated group required more regular check-ups to manage their psychotropic drug prescriptions, but for all youth in this study, having Medicaid increased the odds of having a medical checkup and dental exam, which is similar to national data (Perry & Kenney, 2007). Barriers to health care access do exist for families with Medicaid (e.g., difficulty finding pediatric health care providers, wait times, difficulty with transportation; Mofidi, Rozier, & King, 2002), but families with Medicaid in this study were more likely to access preventive health services than were those with other types of insurance.

As was found in a national study of preventive health care in adolescents (Yu, Bellamy, Kogan, Dunbar, Schwalberg & Schuster, 2002), in this study, higher income and Medicaid increased the chance of receiving dental care. Males in this study were more likely than females to have had a dental-checkup, whereas in the national study (Yu et al., 2002) males were less likely to receive dental care. Dental anxiety is more prevalent in girls than boys (Klingsberg & Broberg, 2007), so girls in this study may have been more reluctant than boys to go to their dental check-ups.

Dental check-ups also were less common for youth with minority caregivers compared to youth with non-Latino White caregivers, which is similar to findings of another national study showing that minority children were less likely than White children to receive dental care (Yu, Bellamy, Schwalberg, & Drum, 2001). We focused on caregiver ethnicity rather than youth ethnicity because within child welfare populations, caregivers may not be biological parents but are the gatekeepers to health care (Schneiderman & Villagrana, 2010).

Caregivers of comparison adolescents reported youths' colds and pain in the previous 30 days slightly more often than did caregivers of maltreated youth, but no more cold or pain medications taken by the comparison group and no differences in illness during the previous 12 months. These differences were likely not clinically significant. This finding differed from our hypothesis, based on evidence that maltreated youth have high levels of serious medical problems and chronic disease (Ringeisen et al., 2008). It is possible that relative and unrelated caregivers, comprising 39% of caregivers of the maltreated group, may not have been able to identify the adolescent's health status concerns as well as biological parents (94% of caregivers in the comparison group), or that both groups experienced a relatively high level of adverse experiences with negative health effects (e.g., an incarcerated parent, and extreme poverty; Brooks-Gunn & Duncan, 1997; Brooks-Gunn, Duncan, & Aber, 1997). It is also possible that more regular medical checkups among maltreated adolescents led to treatment of health issues before they become symptomatic (Starfield, Shi, & Macinko, 2005). Despite a difference in health care use, the rate of medical checkups was

high for both maltreated (87.7%) and comparison (77.3%) adolescents. These health use rates among a sample of 10- to 15-year-olds were higher than national estimates of medical checkup rates for youth aged 11–21 (32%; Yu et. al., 2001), although the difference in age range may account for some of the difference in health use.

Limitations

The primary limitation of this study was that adolescents' health problems, medication use, and health care use were reported by caregivers because pediatric health provider records and adolescents' self-report were not available. Our approach was chosen because the participants included a vulnerable population. Children in foster care are subject to special protections, and vulnerability in all participants may have led to some response bias. Because this was a secondary analysis of a dataset, we were limited to the questions asked in the parent study. The medication list only included space for three medications currently taken, and adolescents could have been taking more. We did not have information about previously prescribed medications or adherence to prescribed medications, nor were we able to explore the communication between the caregiver and the health care provider, such as phone calls or requests for referrals. The sample included only youth aged 10–15, and the health problems and health care experiences of younger children and older adolescents may likely be different. Generalizability also is restricted to similar urban populations.

Upon enrollment, no comparison adolescents were found to be involved with DCFS, but this does not preclude unreported maltreatment. All youth in the maltreated sample residing with either unrelated or kinship caregivers at enrollment were in foster care, but it was unknown at Time 2 a year later whether the maltreated youth with kinship caregivers were still in the foster care system. Maltreatment experiences were coded from DCFS case records using the Maltreatment Case Record Abstraction Instrument, which does not have a severity measure, and therefore we could not explore how severity of maltreatment was related to health outcomes. Finally, we were unable to make comparisons among small subsamples within the study population.

Conclusions

Youth in the child welfare system due to maltreatment had more caregiver-reported mental health problems than did comparison youth, as was hypothesized, while physical health was comparable, which did not support our hypothesis. A similar environmental context may have played a part in the absent to minimal differences in physical illness prevalence and symptoms between the maltreated and comparison groups but did not mitigate the differences in youths' mental health problems and related caregiving challenges.

The findings suggest that nurses be particularly attentive to mental health support needs of previously maltreated youth and their families, because the psychological effects of maltreatment persist during and long after child welfare involvement. Because the ecological environment can play a large part in physical health problems in all youth, educational campaigns related to adolescent health should include the implications of insurance eligibility and changes in coverage, the importance of preventive health care of adolescents, and symptom recognition and management for common illnesses. For youth in

the present study, although rates of access to preventive care were high, having Medicaid improved their odds of receiving preventive medical and dental care. Increasing the acceptance of Medicaid insurance by neighborhood and school-based services may reduce barriers to preventive care in low-income communities.

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Table 1

Description of Caregivers and Youth With and Without History of Child Welfare Involvement for Maltreatment

	Maltreatment n=207)	Comparison n=142)
	%	%
Youth Gender		
Male	48.8	59.9*
Female	51.2	40.1*
Youth Race/Ethnicity		
African American	43.0	32.4
Latino	33.8	45.1
Non-Latino White	12.1	10.6
Mixed/Biracial	11.1	12.0
Caregiver Ethnicity		
African American	43.2	33.8
Latino	39.8	46.5
Non-Latino White	13.6	15.5
Mixed/Biracial	1.5	1.4
Asian/other	2.0	2.8
Insurance Type		
Medicaid	85.5	28.2*
Private Insurance	2.4	22.5*
HMO	5.8	38.8*
Out of Pocket	3.4	7.7
Other/Missing	2.8	3.5
Any Insurance	93.8	88.8

* $p < .05$ for difference between groups based on Chi-square analysis.

Table 2
Differences in Health Status and Health Care Use of Maltreated and Comparison Adolescents

	Maltreated		Comparison		<i>p</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>	
Frequency of colds in past 30 days	.95	.91	1.17	.89	0.03
Frequency of aches and pains in past 30 days	1.17	.92	1.36	.86	0.03
	%		%		
Medical check-up in past 12 months	87.7		77.3		0.01
Taking psychotropic medication	10.6		4.2		0.03
Caregiver reports adolescent has poor psychological health	39.0		14.9		<.01
Caregiver reports adolescent's psychological health is "difficult or very difficult" from a parenting perspective	25.5		14.2		0.02

Note: Colds in past 30 days included cough, earache, sore throat; aches and pains includes headache, stomachache, other pain. Frequency of colds and aches and pains the last 30 days were coded as 0 = *never*, 1 = *almost never*, 2 = *sometimes*, 3 = *almost always*, and 4 = *always*. Means differences computed using MANOVA; proportional differences computed using Chi-square. During the previous 30 days, based on MANOVA analyses, comparison adolescents had more colds $F(3,38) = 4.05, p = .03$; comparison $M_{adj} = 1.17, SE = 0.08$; maltreated $M_{adj} = 1.36, SE = 0.06$, and aches/pains $F(3,38) = 3.63, p = .03$; comparison $M_{adj} = 1.36, SE = 0.08$; maltreated $M_{adj} = 1.15, SE = 0.06$, than the maltreated adolescents.

Table 3

Youth and Household Characteristics and Youth Maltreatment Status as Predictors of Health Care Use and Caregiver's Assessment of Youth's Health in Multivariable Logistic Regression Analyses

Order of Entry	Variables in Block	Medical Checkup in Past 12 Months	Dentist Visit in Past 12 Months	Caregiver-reported Poor Youth Physical Health	Caregiver-reported Poor Youth Mental Health	Parenting Difficulties from Youth Physical Health	Parenting Difficulties from Youth Mental Health
		Adjusted OR (CI)	Adjusted OR (CI)	Adjusted OR (CI)	Adjusted OR (CI)	Adjusted OR (CI)	Adjusted OR (CI)
Block 1	Youth age	1.02 (.79–1.32)	.83 (.64–1.07)	1.14 (.84–1.55)	1.09 (.88–1.36)	1.19 (.86–1.64)	1.23 (.96–1.54)
	Female youth gender ^d	.94 (.52–1.71)	1.91 (1.06–3.46)*	.57 (.28–1.18)	.99 (.60–1.62)	.84 (.40–1.78)	1.22 (.71–2.10)
Block 2	Caregiver age	1.05 (.69–1.60)	1.22 (.81–1.82)	.78 (.48–1.25)	1.15 (.83–1.59)	.68 (.41–1.12)	.77 (.53–1.19)
	Caregiver ethnicity non-Latino White ^d	.71 (.32–1.55)	.26 (.08–.89)*	1.71 (.49–5.96)	1.03 (.50–2.14)	1.56 (.38–4.79)	.63 (.30–1.31)
	Household income	.99 (.74–1.33)	1.45 (1.08–1.95)*	1.17 (.83–1.65)	.91 (.71–1.16)	1.01 (.70–1.46)	1.06 (.82–1.38)
	Medicaid (versus all other ^d)	2.17 (1.01–4.64)*	2.52 (1.21–5.27)*	1.26 (.48–3.29)	1.64 (.83–3.25)	1.30 (.47–3.58)	.87 (.42–1.79)
Block 3	Maltreatment group (versus comparison ^d)	1.37 (.64–2.91)	1.25 (.59–2.66)	1.33 (.52–3.40)	2.58 (1.33–5.01)*	1.37 (.51–3.66)	2.65 (1.27–5.52)*

Note: OR= odds ratio; CI= 95% confidence interval. Caregiver age, child age and household income category treated as continuous variables; Caregiver ethnicity coded as non-Latino White versus minority (African Americans, Latinos, biracial/other).

^dReference group

* $p < .05$