

Health Service Use of Sexually Abused Adolescents Aging Out of Care: A Matched-Cohort Study

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Abstract:

Objectives: While sexual abuse during childhood is a known risk factor of adult physical and mental health problems, little is known about the relationship between CPA services and healthcare use for these problems. This study aimed to assess whether sexually abused youth seek more medical services than their peers in the general population and whether those aging out of CPA's care at the age of 18 use health services differently than those still receiving CPA service (those under the age of majority, e.g. 18).

Method: A prospective matched-cohort study was used to assess the healthcare use of 481 sexually abused youth and 481 matched controls. Using administrative databases from a Canadian provincial public health insurance and from an urban child protection agency, healthcare use at 17 and 18 years of age was compared according to past childhood sexual abuse and to whether those receiving CPA services had aged out of care or not.

Results: Results revealed that sexually abused youth were 5 times and 1.6 times more likely to use in- and outpatient services for a mental health and physical health problem, respectively, than youth from the general population. Furthermore, adolescents' healthcare use for mental health problems remained the same at 17 and 18 years of age, regardless of age at CPA service termination, while healthcare use for physical health problems increased at 18 years of age when compared to 17 when aging out of care only.

Conclusion and Implications: These results suggest that offering CPA services beyond 18 years of age could help sexually abused youth transitioning out of care, and who exhibit more physical health problems, make this transition more easily or with more resources.

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Keywords:

Childhood sexual abuse, transition to adulthood, physical health, mental health

Introduction

It has been well established that sexual abuse during childhood and adolescence is associated with a variety of adverse consequences with regards to short and long-term mental health (Chen et al., 2010; Maniglio, 2009; Tyler, 2002). A growing number of studies suggest that being exposed to sexual abuse during childhood is also associated with an increased risk for physical health problems in adulthood (Irish, Kobayashi, & Delahanty, 2010; Ratnani et al., 2016). Physical health problems such as pain, inflammation, and autoimmune disorders (e.g. migraine, Crohn's disease, irritable bowel syndrome, type 1 diabetes, and rheumatoid arthritis)(Anda et al., 2010; Severson, 2012); disordered eating leading to obesity or other nutrition disorders (Chartier, Walker, & Naimark, 2007; Gustafson & Sarwar, 2004; Neumark-Sztainer et al., 2000); as well as cardiovascular disease, such as arteriosclerosis and ischemic heart disease have been associated with childhood sexual abuse (Goodwin & Stein, 2004; Wilson, 2010).

Not all health problems of children who experienced sexual abuse manifest in adulthood. Youth in care have an increased risk of reporting a number of health problems up to ten-fold compared with those in care who did not experience childhood sexual abuse (Ratnani et al., 2016). For example, adolescent girls are up to six times more likely to report poor general health after being exposed to sexual or intimate partner violence than their non-exposed peers (Decker et al., 2014). While for male youth in particular, problematic placement trajectories are linked with childhood sexual abuse as these experiences increase the likelihood of out-of-home placement settings, placement instability, and placement in locked care facilities, and these outcomes have been linked with mental health and clinical problems in the period directly following aging out (Esposito et al., 2014, 2017; Hickey, McCrory, Farmer, & Vizard, 2008; Leathers & Testa, 2006). Children and youth involved in the justice system who report more general physical health problems, injuries, and hospitalizations are more likely to have increased exposure to partner violence, physical and sexual abuse during childhood (Odgers, Robins, & Russell, 2010). Compared to the general pediatric population, a prospective matched-cohort study has also revealed that sexually abused children and adolescents had an increased annual incidence rate of in- and outpatient consultations for physical and mental health problems that persisted up to five years after the abuse was reported to child protection agencies (CPA) (Daigneault, Vézina-Gagnon, Bourgeois, Esposito, & Hébert, 2017). This seems to indicate that abused children's physical as well as mental health problems persist into emerging adulthood, although this transition period has not been fully documented with regards to healthcare use and its correlates.

Youth aging out of care, i.e. those becoming adults while in care and ceasing to receive CPA services because they've reached the age of majority¹, not because they no longer require services, often make this transition to autonomy without financial resources and little or no family support (Lee & Morgan, 2017; Lopez & Allen, 2007), which can put them at risk for unfavorable behavioral and health outcomes in young adulthood (Courtney Mark & Dworsky, 2006; Kang-Yi & Adams, 2017). Because young adults aging out of care often do so without the continued family support that non-served children have, this phase represents a difficult time generally described by out-of-home care alumni as one marked by anxiety, insecurity, loneliness, financial difficulty, un/underemployment, homelessness/housing insecurity, and other outcomes that have deleterious effects on health (Kang-Yi & Adams, 2017; Kovarikova, 2017; Mickleborough; Children's Aid Society; Office for the Provincial Advocate, 2016). Health services typically facilitated by CPA, such as mental and physical health specialists, therapeutic groups, one-on-one counseling, and other interventions may become remote to out of home care alumni as there may be less support for accessing these services on a regular basis. Indeed, alumni have noted that they often do not have the know-how for managing basic life skills because CPA agency workers do so much for them (Kovarikova, 2017; Mickleborough; Children's Aid Society; Office for the Provincial Advocate, 2016).

The existing literature indicates that aging out of care youth's healthcare needs may be

¹ For most Canadian children receiving CPA services, the age of 18 is the cut off point for eligibility for service. However this can vary across jurisdiction and agency on a case-by-case basis depending on the needs of served children and resources of the jurisdiction and agency.

increased during the transitioning phase towards adulthood. However, research results are inconclusive regarding whether transitioning youth have reduced access to healthcare or not (Ahrens, Garrison, & Courtney, 2014; Courtney Mark & Dworsky, 2006), while some results indicate that mental health service use declines (McMillen & Raghavan, 2008). Lack of health insurance has been suggested to explain why youth transitioning out of care do not receive the healthcare services they need (Council on Foster Care, Adoption and Kinship Care and Committee on Early Childhood, 2012) in some contexts, but other explanations for reduced access may be relevant in a Canadian context with universal healthcare.

Goals

The goals of this study are to assess: (1) if the use of these services varies between 17 and 18 years of age, which is one year preceding and following the legal adulthood threshold of 18 years in the province, i.e. the age at which CPA services can no longer be offered; and, (2) whether the age at which youth cease to receive child protection services is associated with the frequency of services received for physical and mental health problems. Our hypothesis is that sexually abused youth will report more health problems than those from the general population at 17 and 18 years of age. However, because previous study results were inconclusive, no hypothesis is made regarding the second goal of the study.

Methods

The ethics committee of the participating child protection agency (CPA), the first author's institutional review board and the provincial Commission for access to information issued an ethical certificate of conformity and granted authorization to obtain the data used in this prospective study using a matched-cohort design.

Procedures and participants

Participants were selected in the context of a larger study documenting 17 years of healthcare use and physical and mental health diagnoses of 1764 children and adolescents (see 1 reference for more details on the larger study). Sexual abuse was defined as any gesture of a sexual nature, with or without physical contact, committed by an individual without consent from the person or, in some cases, particularly that of children, through emotional manipulation or blackmail (MSSS, 2001).

Recruitment procedures and inclusion criteria were as follows (See Figure 1). First, all children and adolescents with a substantiated report of sexual abuse between January 1st, 2001, and December 31st, 2010, in one large Canadian city's CPA were eligible and selected for the study. Second, identifying information (health insurance number, name, date of birth, etc.) from the CPA's databases for the 955 children who met the first criteria was matched with identifying information from administrative databases from the province's public health insurance agency based on a 100% identical deterministic data linkage strategy. That second criterion was met for 92% of the initial sample ($n = 882/955$) (see Daigneault, Vézina-Gagnon, et al., 2017 for a comparison of included and excluded participants). Their ages varied between less than 1 year and 17 years at the time of the sexual abuse report ($M =$

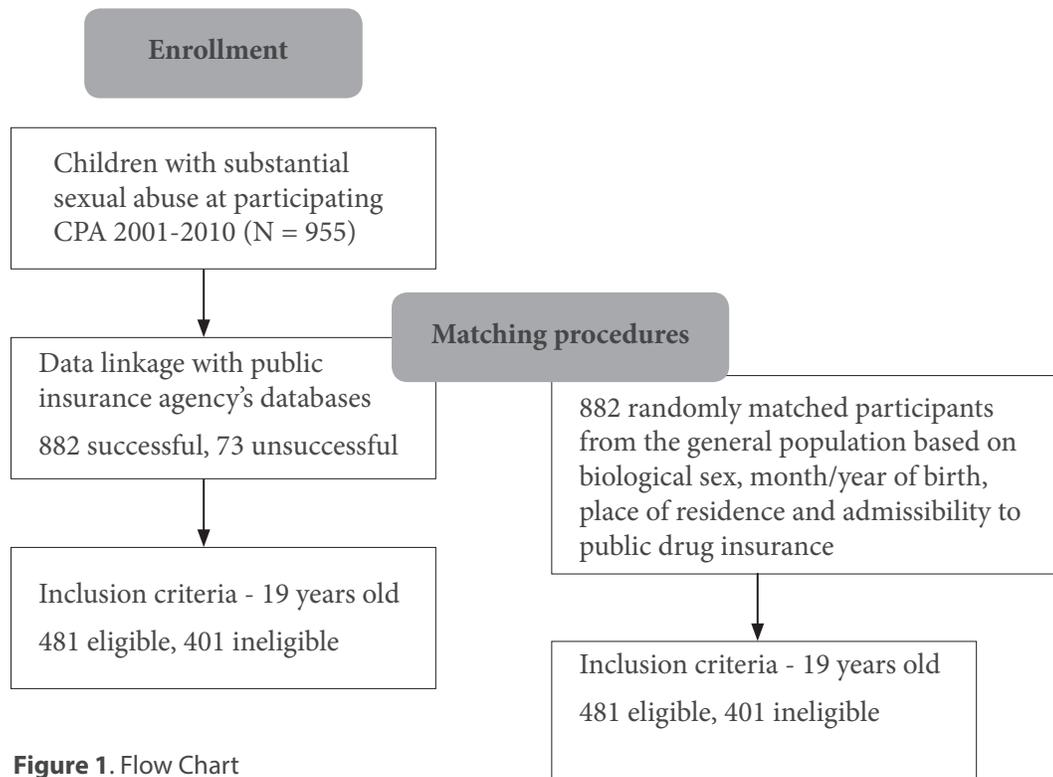


Figure 1. Flow Chart

11.11, $SD = 4.18$). Because the current study focused on sexually abused youth aging out of care, a third criterion was applied to retain only participants who reached their 19th birthday before the end of the study's data extraction period or March 31, 2013, i.e., who were born before March 31, 1994.

Sexually abused males and females that met the third inclusion criteria ($n = 481$; 55%) were compared to those who did not ($n = 401$; 45%) on gender and CPA services received. Group comparisons reveal that excluded participants comprised more males than included participants (30% vs. 22%; $\chi^2 = 7.51$, $p < .01$), which is concordant with the fact that males entered the study younger than females did (Daigneault, Bourgeois, et al., 2017; Daigneault, Vézina-Gagnon, et al., 2017), i.e., fewer of them may have reached their 19th birthday before the end of the data extraction period. Furthermore, excluded participants started receiving CPA services at various age periods (2-5 years old = 20%, 6-9 years old = 29%, 10-13 years old = 24% and 14 years or older = 27%), whereas included participants started when they were older (2-5 years old = 0%, 6-9 years old = 3%, 10-13 years old = 19% and 14 years or older = 78%; $\chi^2 = 290.2$, $p < .001$), which was also expected due to the third inclusion criteria and time frame of the study. Excluded participants' security and development were more often deemed compromised and in need of CPA intervention (70%), compared to included

participants (54%; $\chi^2 = 22.17, p < .001$). Also, fewer excluded participants were receiving services as young offenders (9%) or were placed in out-of-home care (20%) compared to included participants (22%; $\chi^2 = 26.18, p < .001$ and 30%; $\chi^2 = 13.06, p < .001$), respectively. Finally, the number of substantiated reports was similar for excluded ($M = 3.05, SD = 2.64$) and included participants ($M = 3.18, SD = 3.06; t = -0.65, p > .05$).

A control group was created using databases of the public health insurance agency covering all Canadian citizens residing in the province. Each abused child included in the study ($n = 481$) was individually matched to another child ($n = 481$) from the province's general population pool according to four criteria: (a) biological sex; (b) birth year and month; (c) place of residence at the time of the sexual abuse report; and (d) admissibility to the province's public drug insurance at the time of the sexual abuse report (proxy for socio-economic status). Each participant selected from the general population was matched only once to a participant from the sexually abused group. Furthermore, every child with a substantiated report of child sexual abuse selected in the study was excluded from the pool of children who were selected as matched controls. Therefore, children from the matched cohort did not have a substantiated report of sexual abuse between 2001 and 2010 at the same CPA. However, because not all sexual abuses are reported and substantiated, the absence of sexual abuse prior to or during the study could not be ascertained in the control group. For the main analyses, only the 481 matched participants that reached their 19th birthday during the study were retained to create the current study's control group.

Independent Variables

A sexual abuse report must follow a series of steps in order to be considered substantiated by the CPA. Once the report is retained for an evaluation, a social worker makes a clinical judgment regarding the level of corroboration of the sexual abuse. The sexual abuse report could be: 1) substantiated (sufficient evidence that sexual abuse has occurred), 2) suspected (suspicion of sexual abuse but insufficient evidence to substantiate the presence or absence of abuse), or 3) unsubstantiated (sufficient evidence to the absence of sexual abuse) (MSSS, 2016). For the current study, every child who had at least one substantiated report of sexual abuse between 2001 and 2010 at the participating CPA was selected. If there was more than one substantiated report during the study for a specific child, the first report was used to match a control participant according to criteria (c) and (d) described above. The study population is thus divided into two groups, i.e. those that have a substantiated report of childhood sexual abuse between 2001 and 2010 at the participating CPA and who reached their 19th birthday before the end of the study's data extraction period and those individually matched from the general population. These two groups represent the two levels of the independent variable used in analyses to test the first goal of the study.

Based on the age at which CPA service termination occurred for participants in the sexually abused group, two subgroups were created to test the third goal of the study. Sexually abused youth who were 17.51 years or more at CPA service termination were included in the aging out of care group ($n = 106; 22%$), meaning that their services were terminated because they legally reached adulthood and could not receive CPA services anymore. The

second group, not aging out of care, comprised those who were 17.5 years and less when they ceased to receive services from CPA ($n = 375$; 78%), indicating another reason for service termination, usually because CPA assessed their security and development were no longer compromised (e.g. improvement in the family situation, adoption). The average age at CPA service termination of those aging out of care was 18.38 ($SD = 1.34$), and it was 15.11 ($SD = 2.00$) for those not aging out of care. These two groups represent the two levels of the independent variable used in analyses to test the second goal of the study.

Dependent Variables

Administrative databases from the province's Ministry of Health (inpatient healthcare) and Health Insurance Agency (outpatient healthcare) were used to document healthcare use for physical and mental health problems of both groups. First, mental and behavioral disorders (category V, e.g.-) from the 10th revision (World Health Organization, 2011) of the International Classification of Diseases (ICD) were documented (except Mental Retardation codes F70 to F79 – see control variables) Two dependent variables were computed for mental health consultations using the total number of physical health disease diagnoses related to in/outpatient consultations for each participant at 17 and 18 years of age, i.e. between the 17th and 18th birthday and the 18th and 19th birthday, respectively. Each represents the total number of mental health consultations one year prior and one year after the legal age of adulthood (i.e. 18 years of age). Second, two other dependent variables were computed representing the total number of physical health diseases related consultations (the first fourteen ICD categories except V – Mental health; e.g. III diseases of the blood, XIII diseases of the musculoskeletal system and connective tissue) at 17 and 18 years of age, i.e. between the 17th and 18th birthday and the 18th and 19th birthday, respectively, for each participant.

Control Variables

Because of their link with physical and mental health disorders, and sexual abuse, confounding variables were also controlled in the analyses (Euser, Alink, Tharner, IJzendoorn, & Bakermans-Kranenburg, 2015; Hussey, Chang, & Kotch, 2006). These are: material and social deprivation at the time of the first substantiated sexual abuse report (derived from the postal code) (Pampalon & Raymond, 2000); the ICD 10 categories; Mental retardation; Certain conditions originating from the perinatal period (e.g., low birth weight or premature birth, fetal acidosis, birth trauma); and, Congenital malformations and chromosomal abnormalities (e.g., Down syndrome, fetal alcohol syndrome).

Analyses

To determine whether participants from the sexually abused group had a more frequent in/outpatient healthcare use than those from the matched-control group at 17 and 18 years

of age, two conditional, negative, binomial general linear mixed models were used, which controlled for the confounding variables described above. An interaction term was also added to determine if groups differed over time (17 years vs. 18 years) in the frequency of their healthcare use. To determine whether, at 17 and 18 years of age, the frequency of in/outpatient consultations for mental and physical health problems of sexually abused youth aging-out of care was different from those who did not age out, we performed two negative binomial general linear mixed models using the dichotomized age at CPA service cessation variable described above as an independent variable.

Results

First Study Goal

The results presented in Table 1 reveal that healthcare use for mental and physical health problems did not vary over time for the entire sample, which means that the frequency of in/outpatient consultations was similar at 17 and 18 years of age for all participants. Significant group effects indicated that in/outpatient consultations for mental and physical health problems of participants from the sexually abused group were 5.0 times and 1.6 times more frequent, respectively, than those of the general population group. The Time x Group interactions were not significant, indicating that time was similarly unrelated to the outcomes in both groups, or that sexually abused youth and those from the general population showed no increase in mental and physical healthcare use at 18 years of age (i.e. their first year of legally defined adulthood) when compared with 17 years.

for mental health problems for those aging-out of care when compared to those not aging out (Group effect: Wald $\chi^2 = 16.75$, $p < .05$). However, the frequency of in/outpatient consultations for mental health problems did not change between 17 and 18 years (Time

Table 1. Results from Two Corrected Conditional, Inverse, Binomial GLMM Using Time, Group, and Time x Group Interaction to Predict In/Outpatient Consultations for Mental Health and Physical Health^a ($n = 962$).

	Mental Health				Physical Health			
	Coefficient (SE)	t	RR	95% CI	Coefficient (SE)	t	RR	95% CI
Time	0.17 (.35)	0.50	1.19	-0.51-0.84	0.15 (.10)	1.45	1.16	-0.05-0.34
Group	1.74 (.34)	5.11*	5.70	1.07-2.4	0.46 (.11)	4.04*	1.58	0.24-0.62
Time x Group	-0.09 (.44)	-0.21	0.91	-0.96-0.78	-0.23 (.15)	-1.56	0.79	-0.51-0.06

Abbreviations: SE, standard error; RR, relative risk; CI, confidence interval

^a Controlling for material and social deprivation, mental retardation and congenital malformations.

Second Study Goal

Among the subgroup of abused participants, average healthcare use for those aging out and those not aging out is described in Table 2. Results of the negative binomial general linear model analyses reveal that, on average, there was a slightly higher rate of consultations

Table 2. Average Number of Uncorrected In/Outpatient Consultations for Mental Health and Physical Health Problems at 17 and 18 Years of Age According to Whether Sexually Abused Participants Aged out of CPA Services or not ($n = 481$).

		Mental Health		Physical Health	
		17 years	18 years	17 years	18 years
Aging out	n	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Yes	106	1.51 (3.73)	1.89 (5.30)	5.41 (6.85)	8.63 (16.72)
No	375	1.22 (5.94)	1.04 (5.51)	5.27 (7.46)	5.13 (8.07)

Note. Aging-out: yes = CPA service termination at 17.51 or more, and no = CPA service termination at 17.50 or less

effect: Wald $\chi^2 = 1.55$, $p > .05$) and this was true for both groups (Time x Group interaction effect: Wald $\chi^2 = 3.51$, $p > .05$). Analyses for physical health problems reveal that there was also, on average, a higher rate of consultations for those aging-out of care (Group effect: Wald $\chi^2 = 18.40$, $p < .05$), that there was a slight increase in the frequency of in/outpatient consultations for physical health problems between 17 and 18 years (Time effect: Wald $\chi^2 = 9.17$, $p < .05$) and that this change was not the same for those aging-out of care when compared to those who did not (Time x Group interaction effect: Wald $\chi^2 = 8.07$, $p < .05$). The average number of consultations per year and group presented in Table 4 indicates that youth aging out of care whose CPA services ceased on or close to their 18th birthday had an increased number of in/outpatient consultations for physical health problems between 17 and 18 years of age (average of 3.22 consultations more), while the rates were similar for those who did not age out of care.

Discussion

The purpose of this study was twofold. First, to determine if the use healthcare services varied between the year preceding and following legal adulthood for sexually abused youth and those from the general population and second, whether CPA service termination at 18 was associated with changes in healthcare service use one year before and after legal adulthood. The results of the current study reveal that youth sexually abused during childhood or adolescence had more in/outpatient consultations than youth from the general population for physical and mental health problems at 17 and 18 years of age. However, in general, there was no difference in the frequency of in/outpatient healthcare consultations between 17 and 18 years of age.

For sexually abused youth aging out of care, there was an increase in the frequency of in/outpatient consultations for physical health problems between 17 and 18 years, compared to those still receiving CPA services. This increased health service use was not found for mental health problems, with frequency of service remaining similar at 17 and 18 years of age for both groups of CPA involved youth, regardless at the age when services ceased.

These results are consistent with those of other studies that suggest sexual abuse survivors are at higher risk for mental and physical health problems. A longitudinal study

spanning 30 years found that adults sexually abused in childhood had a higher frequency of visits to physicians over the lifespan (Fergusson, Boden, & Horwood, 2008). Others have found an increased outpatient service use in adult populations exposed to childhood sexual abuse for autoimmune and inflammatory diseases, chronic pain and pain disorders, as well as eating disorders, addictions and mental health services, when compared with non-exposed populations (Fergusson et al., 2008; Irish et al., 2010; Sachs-Ericsson, Blazer, Plant, & Arnow, 2005; Severson, 2012; Wilson, 2010).

The observed difference between abused youth aging out of care and not aging out of care with regard physical healthcare use is also similar to other studies indicating increased health problems following CPA service termination when aging out (Courtney Mark & Dworsky, 2006). This increase indicates that sexually abused youth transitioning out of care may be living in conditions which put their physical health at risk, such as homelessness and other high stress living situations (Courtney Mark & Dworsky, 2006; Yen, Hammond, & Kushel, 2009). It also underlines the fact that CPA services or some form of support may still be needed after 18 years for abused youth. It is important to assess the need for, and ensure, ongoing or transition services. For those under pediatric care, ongoing or transition pediatric healthcare services may also be necessary to prevent transitioning youth to simultaneously fall out of two systems of care and have no one familiar to turn to. The increase also indicates that physical healthcare remains accessible following CPA service termination in a context where healthcare coverage is free and universal, as it is throughout Canada. The fact that mental health service use has also remained stable over the adulthood transition period, regardless of whether or not CPA involved abused youth were aging out of care, may be an indication that services remain accessible. This may be contrary to previous results indicating reduced access to mental healthcare for aging out youth after reaching adulthood (McMillen & Raghavan, 2008) and may be due to the different medical insurance accessibility between the US and Canada. This study would need to be replicated in both these contexts.

This study's results should be interpreted in light of some limitations. The use of administrative data limits the studied variables to those collected by the CPA and public health agency, which precludes considering other intervening variables or outcomes such as perceived health (Brownell & Jutte, 2013). Also, information collected in administrative databases is subject to procedure changes and inconsistencies in data entry (Leach, Baksheev, & Powell, 2015). Participating youth may have experienced physical or mental health problems without consulting their physicians, which might underestimate the physical or mental health problems described in this study. Also, it is possible that some of the children and adolescents in the matched-cohort group were sexually abused but never disclosed it to anyone. However, this last bias tends to underestimate the differences between our two samples, which strengthens our results. The current study used very broad diagnostic categories, which precluded identifying specific physical health outcomes that could be the focus of prevention efforts. Finally, other co-occurring maltreatment may have been associated with the outcome variables but were not systematically assessed in both groups and could not be controlled for in analyses.

These limits are counterbalanced by a number of study strengths, namely the matched-

cohort design using longitudinal administrative data. The use of de-identified administrative data is a reliable way to obtain information about sensitive issues, such as sexual abuse and health problems, while protecting the privacy of the participants (O'Donnell et al., 2010). It also allows for the constitution of larger samples and the prospective documentation of many variables over long periods of time, which helps understand the complex consequences of child maltreatment (Belsky, 1993; Brownell & Jutte, 2013). To our knowledge, this is the first study to prospectively assess the physical and mental health problems of sexually abused youth aging out of care.

Future studies should additionally assess whether the increased healthcare use for physical health problems observed in the current study is specifically associated with aging out of CPA or, more generally, with CPA service termination. This could be determined by assessing healthcare use pre- and post CPA termination at various ages at which CPA services cease and not solely at 18 years of age. Indeed, those not aging out of care may have had an increase in healthcare use at the time of CPA termination, at 15 years of age on average, rather than at 18 years. Further investigations should also ascertain mediators and moderators of the association between sexual abuse and healthcare use for physical and mental health issues, especially for youth aging out of care, such as healthcare insurance (Council on Foster Care, Adoption and Kinship Care and Committee on Early Childhood, 2012), gender, time receiving CPA services or other co-occurring child maltreatment. This could shed light on factors fostering youth's resilience through this transitioning period (Daining & DePanfilis, 2007) and indicate what type of transitioning services should be put in place when CPA services cease (Lee & Morgan, 2017).

Implications

In conclusion, these results suggest that healthcare workers, involved with children and adolescents, especially those in charge of CPA, should assess for exposure to sexual abuse and other forms of maltreatment, not only when confronted with possible mental health problems but also recurring physical health conditions or complaints. Identifying sexual abuse victims could help prevent or decrease the impact of further mental or physical health problems. Results also indicate that continuation of CPA services beyond 18 years of age with a transitioning period may be beneficial, and that the physical health of abused youth aging out of care should be preventively assessed. Such results also call for prevention strategies against sexual abuse. Campaigns inviting and helping children and adolescents to disclose sexual abuse would also be beneficial in order to intervene earlier, foster resilience and decrease the negative consequences on their health.

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