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Betrayal Trauma, Health Care Relationships, and Health in Patients with a Chronic Neurovascular Condition

Bridget Klest, Andreea Tamaian, and Christina Mutschler

Clinical Psychology Department, University of Regina, Regina, Saskatchewan, Canada

ABSTRACT

Individuals who have been exposed to trauma are at a greater risk of developing a chronic physical health condition and use health services more frequently than individuals who have not experienced trauma. The mechanism by which trauma affects health is not fully understood, but relationships with health care providers could be important in understanding this association. The purpose of this study was to explore the relationships among betrayal trauma, health care relationships, and physical and mental health in a chronic medical population. Participants (N = 272) diagnosed with a chronic neurovascular condition (cavernous malformation) completed an online survey. Questionnaires assessed self-rated health, instances of betrayal trauma, posttraumatic stress disorder (PTSD) and depression symptoms, income, and other demographic factors, and health care relationships. Level of income and the experience of betrayal trauma predicted mental health symptoms (depression, PTSD, or both) and also predicted health care relationships. After controlling for income and previous trauma, mental health symptoms significantly predicted health care relationships. Finally, mental health symptoms, health care relationships, and income predicted self-rated health, although the associations were not straightforward. These results suggest complex interrelations among trauma, mental health, income, health care relationships, and physical health, and a model is proposed for explaining these associations.

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Betrayal trauma; chronic disorder; health care relationships; income; mental health; self-rated health

A large body of research finds that experiencing trauma has significant negative effects on physical health in multiple domains (Kendall-Tackett, 2004; Schnurr & Green, 2004). However, the specific mechanism by which trauma is related to physical health is not yet well understood. There are many processes by which this association could occur, including health behaviors (i.e., engaging in risky behaviors or failing to engage in health promoting behaviors; Zen, Whooley, Zhao, & Cohen, 2012), and factors that could lead to poorer access to care such as poverty and other adverse social circumstances (Klest, 2012; Zielinski, 2009). This study examines

the associations among trauma exposure, mental health symptoms, relationships with health care providers, and self-rated health.

Chronic conditions and trauma

Trauma exposure and PTSD symptoms have been found to predict both more physical symptoms and poor health perception (Kimerling, Clum, & Wolfe, 2000), including self-rated health (Kendall-Tackett, 2004; Schnurr & Green, 2004) and health-related quality of life (Edwards, Anda, Felitti, & Dube, 2004; Klest, Freyd, & Foynes, 2013). Research has indicated that individuals with trauma exposure and PTSD are at a greater risk of having or developing a chronic condition (Sledjeski, Speisman, & Dierker, 2008). Due to the nature of chronic conditions, individuals with these types of illnesses are more likely to have frequent interactions with the health care system. Because survivors of trauma experience both subjective and objective poorer long-term health, these individuals also tend to have frequent contact with primary care providers (Green et al., 2011). Individuals with chronic conditions appear to endure their illnesses for some time before seeking services, which might exacerbate these concerns prior to seeing a medical professional (Coyle, 1999). A history of trauma exposure could lead to a heightened burden on individuals with chronic conditions, and could translate into poorer physical health.

Trauma and health

An abundance of research has looked at the effects of trauma on mental health status. Specifically, PTSD and depression are common sequelae of trauma, sometimes each occurring alone and sometimes together as comorbid conditions, meaning that one patient simultaneously experiences both of these conditions (O'Donnell, Creamer, & Pattison, 2004; Shalev et al., 1998). Mental health conditions, in turn, appear to predict physical health symptoms. Individuals diagnosed with PTSD have higher rates of chronic conditions (Sledjeski et al., 2008), and comorbid PTSD and depression have been found to be associated with greater mental health symptom severity and poorer overall health (Shalev et al., 1998). Depression has also been found to predict nonadherence to medical treatment recommendations (DiMatteo, Lepper, & Croghan, 2000), increased health care utilization (Egede, Zheng, & Simpson, 2002), and less satisfaction with health care providers (Webster et al., 2001) that might lead to poorer overall health.

Pathways between trauma and health

Research has firmly documented that traumatic experiences lead to poorer physical health (Kimerling et al., 2000; Sledjeski et al., 2008), but the

pathways by which this occurs are still unknown. The physiological changes that result from prolonged activation of the stress response system are one pathway to poorer health that has been previously researched (Schnurr & Green, 2004). Experiencing trauma might wear down the body due to the deleterious effects of an overactive stress response. Poor health behaviors could be another pathway in which poorer physical health might occur due to trauma. Research has indicated that individuals who have experienced trauma are much more likely to engage in risky health behaviors such as illicit drug use, sexual activity with numerous partners, nonadherence to medical treatment, and failing to engage in health-promoting behaviors (Rodgers, Norman, Thorp, Lang, & Lebeck, 2005; Zen et al., 2012). Another pathway to poorer health might come from the increased risk of financial and employment difficulties trauma survivors experience. Research has indicated that those who experience both childhood and adult trauma are more likely to be living in poverty (Klest, 2012; Zielinski, 2009), which could lead to poorer access to health care services due to lack of financial stability. Trauma might also affect health by affecting the survivor's relationships with others. Poor quality relationships might impact health due to a lack of social support as well as a heightened stress response (Kendall-Tackett, 2004). The research is not conclusive and other pathways not yet documented in the literature might exist in the relationship between trauma and poor health.

Betrayal trauma

Betrayal trauma refers to trauma that is interpersonal in nature, where there is a relationship of trust or dependence between the victim and perpetrator (Freyd, 1996). Traumatic events can vary in their degree of betrayal, with physical or sexual abuse perpetrated by a parent or intimate partner as examples of high-betrayal trauma, and natural disasters or accidents as examples of low-betrayal trauma (Freyd, 1996). Victims of high-betrayal trauma report poorer physical and mental health than victims of lower betrayal trauma, and the number of high-betrayal traumas an individual is exposed to predicts a variety of physical health outcomes, including increased physical health complaints (Freyd, Klest, & Allard, 2005). Research has found that survivors of high-betrayal trauma are also less likely to trust others (Gobin & Freyd, 2009; 2013).

Patient-provider relationships

Paradoxically, survivors of high-betrayal trauma tend to have frequent contact with primary care providers (Green et al., 2011) but they are also less willing to trust others in interpersonal situations. Thus, they might be less likely to trust individuals who are important for their well-being,

such as health care providers (Gobin & Freyd, 2009, 2013). Trust in medical providers is necessary to ensure that patients will seek needed medical care and adhere to treatment (Hall, Dugan, Zheng, & Mishra, 2001). Evidence suggests that lack of trust in health care providers is associated with poorer adherence to medical advice, lower likelihood of engaging in preventive care, and poorer management of chronic diseases (Musa, Schulz, Harris, Silverman, & Thomas, 2009).

Health care providers might view patients with a history of trauma and with chronic conditions as “difficult,” as they often present with multiple, complex, and vague physical complaints, and providers frequently feel they do not have adequate training to manage this type of patient (Green et al., 2011). As a result, patients might feel misunderstood, not taken seriously, alienated from the medical system, and betrayed (Green et al., 2011). Abuse in the health care system is associated with PTSD symptoms for patients, as well as distrust and avoidance of the health care system (Brüggemann, Wijma, & Swahnberg, 2012). Feelings of betrayal could create a cycle of poor health, negative health care experiences, and patient cognitions of inadequacy of medical services and providers.

Patients tend to be more satisfied with care when they believe their symptoms are getting better and they are making fewer visits to their provider (Hall, Roter, & Katz, 1988). Additionally, when patients see their provider on multiple occasions for the same symptom with no improvement, satisfaction decreases (Jackson, Chamberlin, & Kroenke, 2001). Patients with chronic conditions are presumably more likely to experience dissatisfaction with their provider due to many visits and less improvement in conditions.

Trauma, health, and income

Trauma and income appear to be directly related. Ramstad, Russo, and Zatzick (2004) found that individuals who have experienced trauma have a significantly lower income than those who have not. Additionally, a higher level of poverty-related stress is predictive of more physical and psychological health problems (Santiago, Wadsworth, & Stump, 2011). Individuals who have lower income are more likely to experience trauma and health problems (Klest, Freyd, Hampson, & Dubanoski, 2013), and income is one of the strongest predictors of health status (e.g., Santiago et al., 2011). Traumatic experiences and socioeconomic factors appear to play an important role in an individual’s overall health, but the pathways by which this occurs have not been extensively researched.

Purpose

The purpose of this study was to explore the relationships among betrayal trauma, health care relationships, and physical and mental health in a

chronic medical population. It was hypothesized that a history of trauma would predict PTSD symptoms, mental health symptoms, and the quality of health care relationships in a sample of individuals diagnosed with a neurological disorder called cavernous malformation (CM). Additionally, a significant pathway was predicted between mental health symptoms and the quality of health care relationships. Finally, both mental health symptoms and health care relationships were hypothesized to predict self-rated health. We propose a model to help untangle the relationships among these factors to better understand the experiences of those living with trauma and a chronic health condition.

Method

Participants

Participants were recruited from the Angioma Alliance Patient Registry. Angioma Alliance is a patient support and advocacy organization dedicated to advancing scientific understanding of CM, also called cavernous angioma, and supporting individuals and families affected by this disorder (Angioma Alliance, 2010). CM is a chronic neurovascular condition in which abnormally shaped blood vessels are present in the brain, spinal cord, or both. These lesions can leak blood, causing a wide variety of neurological deficits from seizures to memory problems to sensory and motor deficits. There is currently no cure for CM other than surgical resection of the lesion(s), which carries with it significant risk and is only appropriate for some cases (Angioma Alliance, 2010). CM is relatively rare, present in approximately 0.2% of the general population, and only about one third of individuals who have one or more CMs develop symptoms related to these lesions. The Angioma Alliance Patient Registry is composed of individuals diagnosed with CM who have indicated that they are interested in being contacted for research studies. At the time of data collection, approximately 750 individuals were registered in the Angioma Alliance Patient Registry.

A total of 272 individuals participated in the survey. Of these, 212 provided complete data and 60 provided partial data. Participants with complete data and those with incomplete data were not significantly different with regard to age, $t(267) = 1.21$, *ns*; gender, $\chi^2(1) = 1.43$, *ns*; race or ethnicity, $\chi^2(5) = 4.71$, *ns*; income, $t(262) = 0.02$, *ns*; or education, $t(262) = 1.01$, *ns*. There were participants from around the world, with most being from the United States (68.8%), United Kingdom (9.9%), and Canada (8.5%). Seventy-three percent of the participants were female, 25% were male, and 2% did not specify their gender. Participants ranged in age from 18 years old to 77 years old, and the average age was 44.35 ($SD = 11.71$). A vast majority of participants were White (87.1%), with a

small number of participants identifying with racial minority groups. A total of 10.7% of participants identified as Hispanic or Latino. The median household income in this sample was \$60,000 to \$69,000 per year and participants in this sample were highly educated, with over half indicating they held a bachelor's degree or higher. Although a majority of participants in this study rated their health as good, very good, or excellent (71.7%), a substantial portion (28.3%) rated their health as poor or fair.

Measures

Demographics and medical history

A questionnaire assessing demographics and medical history was constructed for use in this study. Questions assessed age, gender, ethnicity, race, household income, and educational attainment.

Brief betrayal trauma survey

The Brief Betrayal Trauma Survey (BBTS; Goldberg & Freyd, 2006) is a self-report measure of trauma exposure. Respondents are asked to indicate whether they have experienced each of 14 types of traumatic events. The BBTS assesses trauma with varying levels of interpersonal betrayal, from noninterpersonal events (e.g., an earthquake or automobile accident) to interpersonal events (e.g., experiencing or witnessing abuse perpetrated by a close other or someone who is not close the victim). For the purposes of this study, subscales were calculated assessing the number of different types of traumas high in betrayal experienced before age 18 (childhood) and age 18 and after (adult). This measure has been demonstrated to be relatively reliable over time, and yields rates of trauma exposure similar to other measures (Goldberg & Freyd, 2006).

Posttraumatic stress disorder checklist for DSM-5

The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5; Weathers et al., 2013) is a 20-item self-report measure assessing how bothered the respondent is by each of the 20 symptoms of PTSD in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed. [DSM-5]; American Psychiatric Association, 2013). Responses range on a Likert scale from 0 (*not at all bothered*) to 4 (*extremely bothered*). This measure has been validated with the DSM-5 as a diagnostic tool for PTSD. A prior version of this measure has been used extensively in PTSD research, demonstrates good reliability over time, and is highly predictive of meeting diagnostic criteria for PTSD (Norris & Hamblen, 2004). The current version is recommended for research and PTSD screening by the U.S. National Center for PTSD (Weathers et al., 2013).

Center for epidemiologic studies depression scale, revised

The Center for Epidemiologic Studies Depression Scale, Revised (CESD-R; Eaton, Smith, Ybarra, Muntaner, & Tien, 2004) is a 20-item self-report measure assessing the nature and frequency of depressive symptoms a patient experienced over the last week. Responses range on a Likert scale from 0 (*not at all or less than 1 day*) to 3 (*5–7 days*). The original version of this measure (CES-D; Radloff, 1977) has been shown to have high internal consistency in the general population (about .85) and higher rates in clinical samples, and is reliable over time and has good validity. The CESD-R has also been shown to have strong psychometric properties, specifically that it is a valid measure of depression and has high internal consistency (Van Dam & Earleywine, 2011).

Self-rated health

On this measure (Idler & Angel, 1990) participants were asked to complete the statement “In general, would you say your health is,” with one of the following response options: 1 = *poor*, 2 = *fair*, 3 = *good*, 4 = *very good*, or 5 = *excellent*. Previous research has demonstrated that single-question assessments of self-rated health reliably predict health status and mortality (e.g., McGee, Liao, Cao, & Cooper, 1999), and predict future subjective and objective measures of health.

Patient continuity of care questionnaire

The Patient Continuity of Care Questionnaire (PCCQ; Hadjistavropoulos, Biem, Sharpe, Bourgault-Fagnou, & Janzen, 2008), revised for CM, assesses several dimensions of continuity of care between hospital discharge and community/primary healthcare. This measure has been shown to have adequate reliability and validity in initial studies (Hadjistavropoulos et al., 2008). Items were adapted to be appropriate for use with a population with chronic health care needs and ongoing contact with the medical system. Instructions for completing the measure were worded to specifically reference the diagnosis of CM. Only minor wording changes were made (e.g., “I was satisfied” was changed to “I have been satisfied”). A subscale of this measure related to relationships with health care providers was used in the current analyses.

Procedure

This project was approved on ethical grounds by the University of Regina Research Ethics Board. The researcher contacted the Angioma Alliance Patient Registry coordinator, who then sent an e-mail to individuals signed up for the patient registry informing them of the study and providing a link to an online survey. Participation in the study was completely voluntary and anonymous. After reviewing an online consent form and answering eligibility

questions (over age 18, confirmed diagnosis of CM, could read and respond to questions in written English), participants completed a questionnaire battery including those used in this study. Participants could skip questions or end participation in the study at any time. A donation of \$5 was made to Angioma Alliance (Angioma Alliance Canada for Canadian participants) for each eligible person who participated in the study.

Results

Intercorrelations among primary constructs and associations with health

Symptoms of depression and PTSD were strongly correlated in this sample ($r = .58, p < .001$). Given the overlap between these symptoms, a new variable was created by adding PTSD and depression together to represent symptoms of mental health. Thus, the mental health symptoms variable represents symptoms of depression, PTSD, or both depression and PTSD. Zero-order correlations were calculated for associations between all variables in the study, and can be found in Table 1. Significant, medium relationships were found between income and self-rated health, mental health symptoms and income, high-betrayal trauma and mental health symptoms, high-betrayal trauma and PTSD symptoms, and self-rated health and mental health symptoms. Significant, small relationships were found between all the other primary constructs and between some of these variables and the remaining demographic variables (see Table 1).

Proposed model for the pathways between trauma and health

Model using PTSD symptoms as a predictor

A series of multiple regression analyses (described in Table 2) were conducted controlling for the effects of age, gender, race, and education, all of

Table 1. Intercorrelations Among Primary Constructs.

Variable	1	2	3	4	5	6	7	8	9	10
1. Income	1									
2. High-betrayal trauma	-.23**	1								
3. Age	.16**	-.05	1							
4. Race (White vs. non-White)	.14*	.01	.05	1						
5. Gender	-.03	-.10	.10	.06	1					
6. Education	.24***	-.18*	.05	-.05	-.08	1				
7. Health care relationships	.20**	-.21**	-.01	-.03	.10	.18**	1			
8. Self-rated health	.35***	-.16*	-.04	-.001	-.09	.24***	.24***	1		
9. Mental health	-.37***	.38***	-.06	-.004	.03	-.21**	-.26***	-.37***	1	
10. PTSD symptoms	-.29***	.41***	-.07	-.01	.01	-.15*	-.19**	-.24***	.92***	1

Note. PTSD = posttraumatic stress disorder.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2. Pathways Between Trauma and Health (Controlling for Education, Age, Gender, and Race) Using Posttraumatic Stress Disorder (PTSD) as a Predictor.

	<i>r</i>	<i>F</i>	Predictors			
			Income	High-betrayal trauma	PTSD symptoms	Health care relationships
Outcome						Semipartial correlations
PTSD symptoms	.47	9.23***	-.18**	.36***		
Health care relationships	.34	4.29***	.17*	-.18**		
Health care relationships	.34	4.21**	.15*		-.18*	
Health care relationships	.36	4.18***	.14*	-.13	-.11	
Self-rated health	.42	6.80***	.32***	-.08		
Self-rated health	.43	6.17***	.28***	-.05	-.10	
Self-rated health	.44	6.83***	.29***	-.04		.16*
Self-rated health	.45	6.00***	.26***	-.03	-.08	.13*

* $p < .05$. ** $p < .01$. *** $p < .001$.

which were non-significant predictors in all analyses. Both high betrayal trauma and income significantly predicted PTSD symptoms ($r = .47$, $p < .001$). Additionally, both income and high-betrayal trauma significantly predicted the quality of health care relationships ($r = .34$, $p < .001$). Income and PTSD symptoms also predicted the quality of health care relationships ($r = .34$, $p < .01$). In a regression model with both trauma and PTSD, in addition to income, only income significantly predicted the quality of health care relationships ($r = .36$, $p < .001$). PTSD was no longer a significant predictor, and high-betrayal trauma almost reached significance ($r = -.13$, $p = .057$).

Trauma did not directly predict self-rated health, whereas income did ($r = .42$, $p < .001$). After controlling for income and previous traumatic experiences, PTSD symptoms did not predict self-rated health ($r = .36$, $p < .001$). On the other hand, the quality of health care relationships did predict self-rated health after controlling for all demographics and trauma ($r = .44$, $p < .001$). When all variables were added in the model (trauma, PTSD symptoms, health care relationships, and demographics), only income and health care relationships significantly predicted self-rated health ($r = .45$, $p < .001$).

Model using mental health symptoms as a predictor

A second series of multiple regression analyses (described in Table 3) were conducted using the “mental health” variable in place of PTSD symptoms. These analyses were conducted controlling for the effects of age, gender, race, and education, all of which were nonsignificant predictors in all analyses. Both high-betrayal trauma and income significantly predicted mental health symptoms ($r = .49$, $p < .001$). Controlling for previous trauma, mental health symptoms, but not income, predicted the quality of health care relationships ($r = .38$, $p < .001$).

Table 3. Pathways Between Trauma and Health (Controlling for Education, Age, Gender, Race) Using Mental Health as a Predictor.

Outcome	<i>r</i>	<i>F</i>	Predictors			
			Income	High-betrayal trauma	Mental health symptoms	Health care relationships
			Semipartial correlations			
Mental health symptoms	.49	10.21***	-.25***	.30***		
Health care relationships	.34	4.29***	.17*	-.18**		
Health care relationships	.38	4.64***	.11	-.12	-.16*	
Self-rated health	.42	6.80***	.32***	-.08		
Self-rated health	.47	7.77***	.23***	-.01	-.22**	
Self-rated health	.44	6.83***	.29***	-.04		.16*
Self-rated health	.48	7.22***	.22***	<.01	-.19**	.11

* $p < .05$. ** $p < .01$. *** $p < .001$.

After controlling for income and trauma experiences, mental health symptoms predicted self-rated health ($r = .47$, $p < .001$). When all variables were added to the model (trauma, mental health symptoms, health care relationships, and demographics), only income and mental health symptoms significantly predicted self-rated health ($r = .48$, $p < .001$). [Figure 1](#) illustrates our proposed model of the relationships among trauma, mental health symptoms, health care relationships, and self-rated health.

Discussion

This study examined the link among high-betrayal trauma, mental health symptoms (PTSD and depression), health care relationships, and self-rated health within 272 individuals diagnosed with CM. Hypotheses were supported in that level of income and the experience of betrayal trauma (during childhood, adulthood, or both) predicted mental health symptoms (depression, PTSD, or both) and also predicted health care relationships. Of note, after

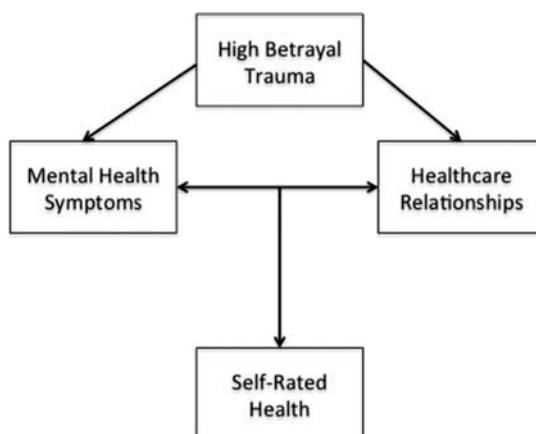


Figure 1. Proposed model explaining the pathways between trauma and health.

controlling for income and previous trauma, mental health symptoms significantly predicted health care relationships. PTSD symptoms alone also predicted health care relationships. Lastly, mental health symptoms and income predicted self-rated health.

Interestingly, trauma did not directly predict self-rated health. In one model, health care relationships predicted self-rated health above and beyond the effects of PTSD symptoms. In our second model, mental health symptoms (PTSD and depression) predicted self-rated health over health care relationships. We hypothesize from these results that both mental health symptoms and health care relationships could influence each other and contribute to self-rated health. The results suggest that both mental health symptoms (especially high levels of comorbidity) and health care relationships are strong predictors of self-rated health for individuals with a chronic condition. The results of this study expand on previous research by describing significant associations among trauma, mental health symptoms, health care relationships, and self-rated health and propose two distinct pathways to explain the association between trauma and health: through the effects of mental health symptoms and through the quality of health care relationships.

Experiencing trauma was found to not necessarily directly lead to poorer health, but rather to create various conditions (i.e., poorer mental health, poorer perceived quality of health care relationships) that might be deleterious to one's self-rated health. Previous research suggests that trauma predicts a variety of long-term physical and mental health concerns, including PTSD and depression (Goldsmith, Barlow, & Freyd, 2004; O'Donnell et al., 2004; Shalev et al., 1998). The presence of mental health symptoms (PTSD and depression) might lead to greater difficulty with education and work (Klest et al., 2013), resulting in a lower income and additional health risks. This study found that poorer mental health (i.e., more depressive symptoms, more PTSD symptoms, or both) predicted poorer overall health (i.e., self-rated health). Trauma survivors who develop a number of symptoms indicative of poor mental health might be more likely to experience worse health.

Given the tendency of individuals with chronic conditions to have frequent contact with health care providers, the second path to poorer health could involve disturbances in these relationships. Individuals who experience high-betrayal trauma are less likely to trust others (Gobin & Freyd, 2013), and might thus encounter additional challenges in interacting with providers. In this study, previous betrayal trauma was found to predict the quality of the relationship an individual has with his or her medical provider. All participants in this study were suffering from a chronic condition and research has indicated that patients with chronic complaints might be more dissatisfied with the medical system due to numerous medical visits for the same condition (Jackson et al., 2001). Therefore, patients might be more likely to view the treatment options for their condition as inadequate, leading to poorer perceived health care relationships.

Patients with chronic medical conditions and those with extensive trauma tend to interact with their providers more frequently than others (Bonomi, Anderson, Rivara, & Thompson, 2009). The patient–physician relationship is therefore essential for the patient’s medical care, overall well-being, and experience with the medical system (Hall et al., 2001). This study replicated previous findings that the quality of the relationship with a medical provider affects the patient’s overall self-rated health, perhaps due to management of chronic conditions (Musa et al., 2009). Given the correlational nature of this study, it is important to interpret these results with caution. Although having experienced traumatic events might lead to poorer health care relationships, it is possible that poor health care relationships might also victimize patients, leading to further perceptions of betrayal.

The potential perception of betrayal plays a vital role in explaining the finding that increased mental health concerns predicted poorer health care relationships. Given the significant correlation between mental health symptoms and health care relationships observed in this study, these two constructs likely relate to one another and also contribute to one another. This pattern could lead to a cycle that ultimately promotes poorer health. The first model tested in this study found that income and health care relationships were the sole predictors of health after controlling for trauma, PTSD symptoms, and demographics. Alternatively, the second model found mental health symptoms (PTSD and depression) and income to be the sole predictors of health after controlling for trauma, relationships, and demographics. Because slight modifications to the regression models led to differences in which predictors retained significance, it is not possible to say with any degree of certainty whether health care relationships or mental health symptoms play a more important role in predicting self-rated health. Thus our proposed model incorporates both of these constructs.

Income has been shown to be one of the strongest predictors of health status (e.g., Santiago et al., 2011), and individuals with a lower income tend to experience both more traumatic experiences and health problems (Klest et al., 2013). This study replicates previous research, with income being a significant predictor in all analyses and models. Although income might predict trauma, trauma experiences might also predict income. Experiencing severe victimizations could prevent someone from working, which might have a direct effect on income. Ultimately, such an individual might end up living in a high-poverty community, which in turn further promotes victimizations (Klest, 2012). Thus, a low income as well as experiencing trauma could create an environment that promotes poorer health and further traumatic experiences.

A limitation to the generalization of these findings is that the sample was mainly female, White, from the United States, highly educated, and more economically stable than the general population. Therefore, the model

proposed should be tested with more diverse populations. Additionally, all the participants in this study were diagnosed with CM, and thus these findings cannot be generalized to the population at large. The importance of joining the Angioma Alliance Patient Registry should also be carefully considered. Patients who might want to aid in furthering research to discover new treatments for CM actively seek ways of doing so, such as joining the registry (Angioma Alliance, 2010). Results might thus not be generalizable to all sufferers of CM; those who chose not to register with the Angioma Alliance might have had different experiences with the health care system and could look different demographically than those who had registered. Even in the current sample of individuals of high economic status, income was the most stable and one of the strongest predictors of all other factors. This finding supports the importance of income as a factor in predicting poor mental health status, self-rated health, and trauma, because it predicts all of these relationships even in a homogeneous sample. However, in a very low-income sample, the associations that were found to be significant here might not generalize due to the high impact that low income might have on the other factors.

Future research on the association and pathways between trauma and self-rated health should directly investigate the experiences of low socioeconomic status and visible minority status in patients with chronic conditions, and their interactions with the medical system. Moreover, research should continue to consider the effect of income on trauma and health in various populations, as well as the different factors that affect patients' experiences in interacting with the medical system. Additional variables should be explored that could mediate or moderate the association between trauma and health. It might be that disturbances in attachment are related to poorer perceptions of health care relationships, and that poorer perception of these relationships results in poorer health. Future studies might also explore how the trauma of having a chronic disease with uncertain prognosis might affect patients and their health care experiences. Due to the correlational nature of such research, it is currently unclear to what extent trauma experiences and health mutually affect each other. This study proposes that trauma predicts mental health symptoms and the quality of health care relationships, which in turn significantly affect one another and might strengthen the impact that trauma has on health; however, these relationships very well might be bidirectional. Finally, both mental health symptoms and health care relationships predict health status. Future research should test these associations and begin to focus on specific interventions to target health care relationships to improve both mental and physical health. Direct assessment of patient-provider relationships within the medical system could provide important direction for change in how medical professionals interact with their patients. Ultimately, such

investigations could improve health care relationships, which in turn could improve patients' psychological and physical well-being.

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Christina Mutschler is now at Ryerson University.

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