

Developmental Neuroscience Informs Policy Related to Migrant and Refugee Children's Mental Health

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Abstract

Migrant and refugee children commonly experience traumatic events and stressful conditions along their migration journeys. Migration-related trauma can have persisting effects on children's mental health. Developmental neuroscience suggests neural mechanisms that connect these experiences to mental health conditions such as post-traumatic stress disorder. This research review, focused on migrant families emigrating from Mexico, Central America, and Haiti and bound for the United States, first overviews the nature of trauma exposure faced by migrant families and next delineates potential neurobiological mechanisms underlying the effects of migration-related trauma on youth mental health. Finally, detailed policy recommendations relate to (1) providing mental health care, (2) addressing chronic stressors in the context of daily life, and (3) preventing migration-related trauma.

Keywords

migration, refugee, trauma, early-life stress, neurodevelopment, mental health, childhood, adolescence

Tweet

Migrant and refugee children commonly face trauma, putting them at risk for mental health disorders. Migration-related trauma has psychobiological consequences during key development periods. Policy recommendations aim to improve children's mental health.

Key Points

- Youth make up over half of the world's migrants and refugees; they face traumatic experiences before, during, and after migration.
- Migration-related trauma can have profound and lasting effects on well-being via neurobiological and psychological mechanisms and contribute to the development of mental health conditions such as post-traumatic stress disorder (PTSD).
- The psychobiological consequences of migration-related trauma should inform policies to promote well-being for migrant and refugee children.
- The policy recommendations target providing mental health services, mitigating chronic daily stressors, and preventing migration-related trauma.
- Local, state, and federal legislators should use the recommendations presented here to take action to improve as well as prevent further harm to the lives of migrant children.

Over half of the world's migrants and refugees are under the age of eighteen (United Nations High Commissioner for

Refugees [UNHCR], 2019), and over 2.5 million migrant and refugee children are living in the United States (U.S.; Levesque, 2021). Adversity is inherent to migrant and refugee children's experiences before, during, and after migration (Mercado et al., 2022). Literature on early adversity sheds light on potential neurobiological, psychological, and behavioral consequences of migration-related experiences for children across development (Blackmore et al., 2020; Cohodes, Kribakaran et al., 2021; MacLean et al., 2020). Here, we apply a neurodevelopmental lens to migration-related adversity and trauma (i.e., actual or threatened death, serious injury, or sexual violence) for children and propose implications for policy change.

Throughout, this review refers to children migrating from their countries of origin as "migrant and refugee children," in describing the experiences of children who are seeking asylum after fleeing their home countries due to violence, war, and persecution. We also use these terms for children who are emigrating in search of better opportunities or safer living conditions but not formally seeking asylum or refugee status. Although migration-related adversity affects children worldwide, when possible, we focus on the experiences of migrant and refugee children from Mexico, Central America, and Haiti coming to the U.S.

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Trauma Exposure Associated with Migration

Migrant and refugee children experience trauma throughout their migration journeys. Trauma exposure is common prior to migration (Keller et al., 2017), with exposure to actual or threatened violence frequently cited as the reason for family migration (Ornelas & Perreira, 2011). During migration, which is itself inherently stressful, youth frequently face significant trauma, with studies suggesting that the majority of caregivers fear for their and their family's safety during migration (Fazel et al., 2012; Ornelas & Perreira, 2011). Families experience forced separation, trafficking, kidnapping, injury by border control officers, sexual violence, racism, and witnessing violent and sexual crimes against children (O'Connor et al., 2015).

Once in the U.S., families are frequently placed in detention facilities and face continued violence. Investigative and firsthand reports have documented horrific conditions in detention centers, including insufficient or poor nutrition, hygiene, and medical and psychological resources, as well as constant light exposure, cold temperatures, forced separation, sexual assault, verbal abuse and intimidation from Immigration and Customs Enforcement (ICE) employees, physical threats, actual and threatened deportation and family separation, and shackling during deportation (Neusner, 2022; O'Connor et al., 2015).

Following migration, migrant and refugee children encounter persistent threats of family separation and deportation (Chaudry et al., 2010). Furthermore, the violence of systemic racism and anti-immigrant policies result in food insecurity, housing instability, and barriers to accessing healthcare (Viruell-Fuentes et al., 2012) and can threaten migrants' mental and physical health (Eskenazi et al., 2019). Together, the trauma inherent to the experience of migration confers significant risk for children's mental health and long-term well-being, as delineated in the next section.

Psychological Effects of Migration-Related Trauma

Migration-related trauma can have lasting impacts on mental health across development (Blackmore et al., 2020; Fazel et al., 2012; Hampton et al., 2021) and likely exacerbates the effects of previous trauma exposure on children's mental health (Fazel et al., 2012; Sidamon-Eristoff et al., 2022). Specifically, exposure to traumatic events in childhood can contribute to immediate and long-term mental health conditions, including PTSD (McLaughlin, Green et al., 2010), which migrant and refugee children experience at a high rate (Blackmore et al., 2020; MacLean et al., 2019, 2020; O'Connor et al., 2015). Further, experiencing detention and horrific conditions in detention centers may directly affect migrant and refugee children's development of

symptoms following migration-related trauma (Keller et al., 2003; Sidamon-Eristoff et al., 2022). Children held in detention centers in the U.S. experience even higher levels of mental health conditions relative to migrant and refugee youth who do not spend time in detention centers (MacLean et al., 2019, 2020).

Attachment to their parents enables children to self-regulate and function in the context of stress. Consequently, parental presence or absence during migration-related stress can mitigate—or exacerbate—effects on children's mental health. Caregivers can buffer the consequences of migration-related trauma exposure (Bean et al., 2007; MacLean et al., 2019, 2020); however, migration often involves threatened or actual caregiver-child separation in detention centers (Waddoups et al., 2019), constituting a major source of caregiving adversity (Cohodes, Kribakaran et al., 2021). In addition to threatening the immediate physical safety of children, forcible separation from caregivers deprives children of the buffering effect of their caregiver's presence (Gunnar & Donzella, 2002). Relative to children who were not separated, children who were forcibly separated from a caregiver during migration experience more psychological difficulties (Bean et al., 2007; MacLean et al., 2019, 2020; Sidamon-Eristoff et al., 2022), which can persist for years following separation (Hampton et al., 2021).

Fears of separation and deportation often persist post-migration due to the constant threat of parental deportation, with adverse consequences for children's mental and physical health (Artiga & Ubri, 2017). Children of undocumented parents in the U.S. experience negative behavioral and emotional changes, as well as drops in academic achievement and an increase in missed days of school, following parental arrests (Chaudry et al., 2010). Migrant parents' own trauma-related psychopathology can also exacerbate children's trauma-related symptoms, particularly when youth and parents are exposed to shared trauma or separation (Scheeringa & Zeanah, 2001). These findings underscore the profound and lasting impacts that migration-related trauma can have on children's mental health.

Neurobiological Mechanisms Linking Migration-Related Trauma with Mental Health

A growing body of research has delineated the neurobiological processes linking childhood trauma with the development of mental health conditions (Gee, 2021; McLaughlin et al., 2019; Teicher et al., 2016). Although we know of no studies investigating neural effects of trauma among migrant and refugee youth, specifically, we review findings among youth exposed to a range of adversities to elucidate potential effects of complex migration-related traumatic experiences on stress physiology and brain development (see Cohodes, Kribakaran et al., 2021 for review). We

specifically focus on the impacts of stress exposure on neurobiology, stress sensitization and its long-term effects, and the buffering role of caregivers.

How Stress Exposure Impacts Neurobiology

Humans' biological stress response systems have evolved to help cope with stressors. The hypothalamic-pituitary adrenal (HPA) axis plays a central role in stress responding, including by regulating the production of stress hormones such as cortisol (McEwen & Akil, 2020). These stress hormones interact with the brain to prepare humans to contend with threats. While these systems can promote adaptive behaviors in the context of adversity, extreme or chronic stress can dysregulate the HPA axis and interfere with individuals' ability to cope with future stressors (Gunnar et al., 2009; McLaughlin et al., 2015). In effect, the HPA axis may become less elastic with repeated stressors over time.

Exposure to stress affects the brain and psychological functioning. For example, chronically elevated levels of stress hormones in the brain can have lasting effects on neural structure and function (McEwen, 2012). Brain regions involved in regulating fear and processing threat and safety in one's environment (i.e., amygdala, hippocampus, and medial prefrontal cortex; mPFC) have more stress hormone receptors and are especially sensitive to stress. Specifically, the amygdala detects emotionally salient environmental stimuli and activates the HPA axis in response to threat; the hippocampus supplies and relays contextual information from the environment; and the mPFC guides learning and regulates amygdala-driven emotional reactivity (Fullana et al., 2016). Together, these regions constitute the cortico-limbic circuit that reduces fear and regulates emotion. Exposure to stress during development—such as exposure to migration-related trauma—is associated with distinct structural and functional changes in cortico-limbic circuitry (see Cohodes, Kitt et al., 2021 for review). Stress exposure also alters large-scale brain networks that support cognitive and affective functions, such as detecting salient stimuli, cognitive control, and reward processing (see McLaughlin et al., 2019 for review). Taken together, these neurobiological changes likely contribute to the development of emotional and behavioral difficulties and mental health conditions among migrant and refugee youth following the trauma they experience (Cohodes et al., 2021; Grasser et al., 2023).

Stress Sensitization and Long-Term Effects

In addition to shorter-term effects on neurobiology and mental health, exposure to stress can produce changes in the brain that persist and increase long-term risk for mental health disorders, even years following a stressor. One mechanism by which this occurs is called stress sensitization: Exposure to stress early in life increases vulnerability to

future stressors (McLaughlin et al., 2010). Corticolimbic circuitry, specifically hippocampal-mPFC-amygdala circuitry, may contribute to the effects of stress sensitization (Hanson et al., 2015; Weissman et al., 2020) given that these regions are closely involved in stress responding via the HPA axis. Over time, stress can alter hippocampal and mPFC function and thus interfere with their regulation of stress responses (McEwen & Akil, 2020). In these ways, exposure to extreme or chronic stress—such as the persistent adversity that migrant and refugee youth face—can dysregulate (e.g., heighten or blunt) responses to subsequent stressors. Consistent with this idea, youth exposed to early adversity show dysregulated cortisol responses to later stressors (Gunnar et al., 2009). Together, these alterations in HPA axis function and corticolimbic circuitry may explain heightened long-term risk for mental health disorders among youth exposed to migration-related trauma, as well as why children exposed to trauma prior to migration may be at greater risk for PTSD when exposed to trauma during migration.

Buffering Role of Caregivers on Children's Stress Physiology

Caregivers play a critical role in buffering children—to the extent possible—from the consequences of stress exposure. The neural systems that support emotion regulation and stress coping—such as regulatory connections between the mPFC and amygdala—undergo protracted development (Casey et al., 2019). Caregivers can modulate children's HPA axis and cortico-limbic circuitry to support these systems while they are still developing (Gee, 2021). Consistent with behavioral and psychological evidence of caregivers' role in helping to regulate children's emotions and stress reactivity (Eisenberg et al., 1998), children show reduced cortisol reactivity (Gunnar & Donzella, 2002) and amygdala reactivity (Gee et al., 2014) in their caregivers' presence. On average, youth exposed to early adversity show disruptions in the buffering effects of caregivers at the neural level (Callaghan et al., 2019), providing mechanistic insight into the ways that adversity can disrupt children's development and their ability to optimally benefit from caregiver inputs throughout development. Together, these findings suggest that support from caregivers has the potential to buffer the effects of migration-related stress on children's neurobiological development, highlighting an important protective factor for migrant and refugee children.

Policy Implications to Promote Migrant and Refugee Youth Mental Health

The scientific evidence base reviewed here yields several key findings that inform policy for migrant and refugee youth. First, converging evidence demonstrates that trauma can have negative consequences on neurobiology and that early-

life trauma is particularly detrimental. Across many studies, the types of trauma that are inherent to children's migration experiences have been associated with dysregulation in stress response systems, altered structural and functional brain development, and increased risk for mental health disorders (Cohodes et al., 2021). Given that the developing brain is especially plastic, trauma experienced during development confers stronger risk (Gee, 2021; McLaughlin et al., 2015; Teicher et al., 2016).

Second, children exposed to trauma are at heightened risk for the development of mental health disorders, both immediately and longer term. Despite the potential for change and intervention, neurobiological and behavioral effects of trauma can persist long after the experience occurs, as is demonstrated in studies of adults who experienced trauma during childhood (Teicher et al., 2016). These findings further highlight that youth exposed to previous trauma—which, definitionally, describes most children whose families are seeking asylum—are at heightened risk for mental health problems such as PTSD following subsequent migration-related trauma.

The third primary takeaway from this broad evidence base is that caregivers play an essential role in buffering children from the consequences of trauma exposure, both neurobiologically and behaviorally (Callaghan et al., 2019; Gee et al., 2014; Gunnar & Donzella, 2002). Studies demonstrating the protective influences of caregivers highlight both the important role that caregivers can play in supporting children during stressful experiences of migration, as well as the compounded trauma of forcibly separating families during migration (Cohodes et al., 2021).

Together, this body of evidence points to the importance of policies that prioritize intervention for youth exposed to trauma, prevention of further stress during and following youths' migration, and, critically, keeping families together throughout the migration experience. To this end, this section provides detailed policy recommendations related to (1) the provision of mental health care, (2) services that address chronic stressors following migration, and (3) the prevention of migration-related trauma.

Implementation and Dissemination of Mental Health Services

Given the short- and long-term neurobiological and psychological consequences of early-life adversity (McLaughlin et al., 2019; Teicher et al., 2016), early intervention for migrant and refugee youth and their caregivers is essential to mitigate the effects of trauma faced during and after migration (Baily, 2017). Although effective therapies can treat trauma-related symptoms following migration-related trauma (e.g., Abdi, 2018; Ellis et al., 2013; Patel et al., 2022), the majority of migrant and refugee youth do not receive mental health screening or therapy (Fazel et al.,

2012). Thus, policies should both address key barriers to mental health care and ensure effective implementation of interventions at each stage of the migration and resettlement journey.

Recommendation #1: Mental Health Assessments and Interventions Should be Trauma-Informed and Address Barriers to Care. During the migration and resettlement periods, migrant and refugee children and families face numerous barriers to appropriate mental health care, including the need to prioritize daily basic needs (e.g., housing, food, employment), stigma related to mental health, and cultural and linguistic barriers (Ellis et al., 2011). Thus, the mental health care they receive should both directly address psychological distress in the context of trauma and stressors and tackle barriers to care (Ellis et al., 2013). To this end, care for migrant and refugee youth should be (1) trauma-informed as well as developmentally (Rojas-Flores et al., 2017) and culturally (Abdi, 2018) appropriate; (2) delivered in families' native languages by providers who practice cultural humility (e.g., understanding the influences of systemic factors and cultural elements; Fisher-Borne et al., 2015); and (3) provide resources and support to address basic needs. For example, the Trauma Systems Therapy for Refugees (TST-R) model ensures that trauma-informed mental health services and psychoeducation are provided at the community and individual level in families' native languages and in partnership with trained community members who can function as a bridge by providing vital cultural context for service provision (Ellis et al., 2013). Further, TST-R supports families in accessing resources such as housing and school placement to relieve daily resettlement-related stressors. Critically, TST-R implemented in refugee communities has been shown to reduce symptoms of PTSD and depression (Ellis et al., 2013), and similar models could be effective in migrant and refugee communities across the U.S.

Recommendation #2: Mental Health Assessments and Interventions Should be Conducted in Both Community and Healthcare Settings. In addition to clinical and hospital settings, assessments and interventions in non-clinical community settings can significantly improve access among migrant and refugee families (Ellis et al., 2011). For example, providing care through community centers could build on existing trust between community organizations and families (Rusch et al., 2015). Schools are also a vital setting for disseminating mental health services, as they can both provide every child the option to receive mental health assessments and care, but also mobilize community-based social supports and help families to manage ongoing stressors (Ellis et al., 2013; Fazel et al., 2012).

To ensure that mental health services are available in multiple settings, more providers trained to provide appropriate care are needed in areas with large migrant and refugee populations. In addition to recruiting additional providers who

can deliver care in children's native languages via telehealth (Endale et al., 2020), novel models can be employed to scale up mental health services for migrant and refugee communities. For example, in a task-sharing or task-shifting model, community members (who often speak the youth's native language) receive training in specific tasks (e.g., screening) from experts and carry out these tasks under the supervision of professionals (Javadi et al., 2017). This practice could increase both access to and the efficacy of care, as youth and their families may be more likely to build trust with providers from their community.

Addressing Chronic Daily Stressors in the Lives of Migrant and Refugee Children

In addition to the trauma experienced before and during migration, migrant and refugee youth often face complex post-migration adversities that may further impact their health. Here, recommendations relate to mitigating several chronic stressors that affect youth, namely fear of separation from a loved one, housing instability, and food insecurity.

The Daily Threat of Family Separation. Migrant youth and families who are undocumented face the threat of family separation in their daily lives. The deportation or detention of parents or children through raids by ICE (López et al., 2017) and racial profiling by police (Lind, 2015) are only two of the ways that migrant families confront potential separation of family members. In addition to driving fear and uncertainty, this constant threat of separation can impact the ways that migrant families access vital resources.

Recommendation #3: End Deportations of Migrant Youth and Family Members. The scientific evidence documenting the neurobiological and psychological consequences of forcibly separating families (Cohodes, Kribakaran et al., 2021)—via deportation, separate placements in detention centers, or other mechanisms—strongly indicates that such practices should end immediately. The UNHCR should also strengthen its enforcement of protections against refoulement for refugees in the U.S. This includes prohibiting deportation to countries where refugees face ill treatment, persecution, and violence (Sy, 2015). These urgent needs underscore the importance of systemic legal changes, in addition to temporary mitigatory solutions.

Recommendation #4: Implement Protocols That Protect Migrant Families in Accessing Vital Resources. Migrant and refugee families are often unable to access resources fundamental to their well-being, due to the threat of deportation or family separation (Artiga & Ubri, 2017). Until deportation and family-separation practices end, policies should protect migrant and refugee families, so that they can access critical health resources. For example, in cities in which migrants are not protected from

federal immigration authorities (i.e., non-sanctuary cities), clinics, mental health centers, community centers, and hospitals should implement policies that address migrant safety (e.g., clearly displaying migrants' rights at clinics, discussing confidentiality policies during phone screening; Dawson-Hahn & Cházaro, 2019). They should also develop safety protocols in the event that immigration officials make families unsafe (Dawson-Hahn & Cházaro, 2019). Making information about these safety plans (e.g., protocols developed by the National Immigration Law Center, 2017) publicly available and accessible (e.g., translated into all languages native to the patient population) can promote greater trust among migrant and refugee families seeking care.

The Chronic Stress of Housing and Food Insecurity

Recommendation #5: The State Should Provide Essential Resources to Migrant and Refugee Families. Housing instability and food insecurity can have significant consequences for the health and development of migrant and refugee children (Potochnick & Arteaga, 2018). Although the Office of Refugee Resettlement provides some vital support (e.g., housing, medical, and social services) to refugee families, these services are not available to *all* migrant youth even if their pre-migration experiences are consistent with those of documented refugees (Kennedy, 2013). Thus, these vital forms of support should be made available to all migrant children, regardless of refugee status. Governing bodies should enact legal changes that account for inconsistencies in the determination of refugee status (Paris et al., 2018).

Recommendation #6: Temporary, Community-Based Solutions Should be Provided to Migrant and Refugee Families. Community-based organizations (CBOs) have historically provided services relating to health, education, social support, and housing for migrant communities. For example, formal medical-legal partnerships between healthcare professionals and lawyers can effectively increase access to health, social, and legal services (Weintraub et al., 2010); mutual aid programs are another resource that serves the immediate needs of migrant and refugee families (Gardner, 2020). Although local institutions (e.g., medical centers) have an obligation to develop programming and provide resources that support migrant and refugee families, programs offered through CBOs are historically relatively better trusted by migrants due to their integration in local communities (Yoshikawa, 2011) and should be financially supported by the state and local institutions.

Preventing the Infliction of Trauma Upon Migrant and Refugee Children

While evidence regarding the detrimental effects of trauma on children's neurodevelopment and mental health clearly underscores the urgent need for interventions that mitigate

the stressors that migrant and refugee children face, developmental neuroscience also points directly to the importance of *preventing* further trauma exposure among migrant and refugee youth. To this end, scientists—alongside community organizations and national agencies (e.g., American Civil Liberties Union)—have called for the immediate suspension of family separation and migrant child detention and the minimization of time spent in detention centers (Cohodes et al., 2020; Pompa, 2019), but these practices continue (Castillo, 2023; Montoya-Galvez, 2022; Morrissey, 2022). The evidence is clear: Experiences of detention exacerbate children's mental health difficulties (A. S. Keller et al., 2003; Sidamon-Eristoff et al., 2022); forcible separation has traumatic effects while also depriving children of the buffering effect of their caregiver's presence (Cohodes, Kribakaran et al., 2021; Sidamon-Eristoff et al., 2022); and, critically, these psychological consequences can persist for years following separation (Hampton et al., 2021). Thus, the psychological need for systemic change is undeniable: Terminate detention and deportation practices and dismantle the policies that separate and detain families (i.e., ICE and CBP; Cohodes, Kribakaran et al., 2021).

Conclusions

Migrant and refugee youth experience profound adversity throughout migration. Foundational research from brain and behavioral science elucidates the psychobiological mechanisms that may link migration-related trauma with mental health-related suffering, underscoring the critical need for systemic changes to promote the well-being of migrant and refugee youth. Local, state, and federal legislators should act swiftly to implement the outlined recommendations. In addition to aligning with fundamental humanitarian and moral considerations underscored throughout this paper, these recommendations align with practical and economic considerations raised by others (Mattingly et al., 2020). Preventing migration-related trauma and providing critical mental health resources will both reduce the staggering burden of mental health disorders on societal well-being (SAMHSA, 2022; Vos et al., 2020) and the immense economic burden of mental health disorders (Knapp & Wong, 2020; Mattingly et al., 2020). In doing so, policymakers can continue to build a society that fundamentally values and promotes the health and well-being of the most vulnerable individuals among us—children desperately needing safety and care from situations and trauma beyond their control.

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