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Perspective

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Tanzi D. Hoover and Gerlinde A. S. Metz



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What Comes after Moral Injury?—Considerations of Post-Traumatic Growth

Tanzi D. Hoover and Gerlinde A. S. Metz *

Canadian Centre for Behavioural Neuroscience, Department of Neuroscience, University of Lethbridge, Lethbridge, AB T1K 3M4, Canada; hoovtd@uleth.ca

* Correspondence: gerlinde.metz@uleth.ca

Abstract: Moral injury is a psychological wound resulting from deep-rooted traumatic experiences that corrode an individual's sense of humanity, ethical compass, and internal value system. Whether through witnessing a tragic event, inflicting injury on others, or failing to prevent a traumatic injury upon others, moral injury can have severe and detrimental psychological and psychosomatic outcomes that may last a lifetime. Post-traumatic experiences do not have to be a permanent affliction, however. From moral injury can come post-traumatic growth—the recovery from trauma in which personal betterment overshadows moral injury. Moral injury may lead to substantial personal growth, improved capacity and resilience. Based on these observations, it seems that from struggles and darkness, there can be positivity and hope. This review will summarize the current concepts of post-traumatic growth and consider potential mechanisms leading to resilience and recovery through post-traumatic growth. These considerations are gaining more importance in light of a growing number of existential threats, such as violent conflicts, natural disasters and global pandemics.

Keywords: distress; resilience; PTSD; major depressive disorder; adverse pregnancy outcomes; preterm birth; COVID-19



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1. Introduction

Moral injury is a term designated for individuals who have been exposed to traumatic events that have violated their sense of morality, humanity, or internal ethics [1–4]. Unlike traditional trauma, which induces physical or emotional wounds, moral injury emphasizes the impact on an individual's moral and spiritual well-being. Moral injury is difficult to define due to the numerous types of experiences that can lead to its inception and the pervasive psychological impact it can have on an individual. The impact of a moral injury on health may entail lifelong, severe functional impairments across multiple domains of functioning, post-traumatic stress disorder (PTSD), and suicidality [2,4,5]. Moral injuries occur through a personal violation, whether through the witnessing of traumatic offenses and/or perpetrating or failing to prevent acts of transgression [6,7]. This can include psychological, spiritual, or religious anguish that cannot be easily reconciled [2,7]. Litz et al. (2009) stipulated that moral injury is based on a betrayal of what is felt to be right (a self-directed action or done by someone in authority) in the context of its perceived significance given the situation or event [7]. The outcome of such an occurrence provokes a deep emotional, behavioral, psychological, or social suffering that impacts daily functioning and cannot be easily remedied with basic interventions [6–8]. Individuals primarily afflicted by such moral injury are members of the military, healthcare providers, and first responders. However, the civilian population globally is also facing a growing number of existential threats, such as violent conflicts, natural disasters or other tragedies, including the recent COVID-19 pandemic. Here, traumatic experiences, but also decision-making and triaging of solutions, may pose a risk of moral injury. This highlights the need to discuss more broadly the concept of moral injury and associated health threats for pregnancy and

birth outcomes [9,10], lifelong mental and physical well-being [11,12] and potential effects on the health of future generations [13,14].

In contrast to moral injury, post-traumatic growth can occur when there is recovery and a positive transformation after a traumatic experience. Post-traumatic growth is defined as the positive psychological changes that occur in the aftermath of a trauma or difficult life circumstances or adversity [15–17]. Zięba et al. (2019) propose that post-traumatic growth may occur in five domains: relating to others, personal strength, appreciation of life, spiritual and existential change, and new possibilities [17]. Their research showed that positive changes associated with post-traumatic growth were observed in the domains of personal strength (26.09%), relating to others (24.22%), and appreciation of life (21.12%); while negative changes mainly affected relating to others (33.33%) and personal strength (23.33%) [17]. Working with breast cancer survivors, Morrill et al. (2008) found that post-traumatic growth helps to improve quality of life, depression, and post-traumatic stress symptoms [18]. They affirmed that finding positive meaning in traumatic situations helps to mitigate negative mental health outcomes [18]. These findings are important because depression in itself has been seen to impede the process of developing post-traumatic growth [19].

Post-traumatic growth may be assessed using the Posttraumatic Growth Inventory, which assesses positive outcomes in those that have experienced a traumatic event [20]. In addition, the Stress-Related Growth Scale (SRGS) measures the perceived positive changes that are a result of a stressful experience [21] and the Changes in Outlook Questionnaire (CiOQ) assesses the positive changes in worldview following adversity [22]. However, it is important to note potential limitations in current studies. Shakespeare-Finch and Lurie-Beck (2014) note in their meta-analysis the difficulty in finding consensus on the relationship between post-traumatic growth and positive traumatic changes and levels of distress; including the lack of consistency in the type of traumatic experience, unreliable ways to assess relationship variables, and participant population variability [23]. There are also limited numbers of studies on this topic, with variations in the types of traumatic experiences, various levels of support and social support, time since past traumatic experience, and the nature of the trauma itself (personal trauma versus health trauma) [24]. Based on these and similar resources, the present perspective provides a short overview of the current concepts of moral injury and at-risk populations. It will also introduce some of the physical and emotional manifestations of moral injury and emphasize the potential of post-traumatic recovery and possible interventions.

2. Current Perspectives

2.1. Moral Injury

A review by Hall et al. (2021) on studies mainly involving military populations reported significant positive correlations between moral injury constructs, mental health, and behavioral outcomes [25]. They go on to suggest that meaning-making, social support, and pre-deployment psychoeducation on the topic helped to moderate the effects of moral injury. Moral injury can have a detrimental and lasting impact on an individual. The aftermath of moral injury may include elevated despair, distrust of others, and increases in interpersonal violence [26]. Studies have shown that exposure to morally injurious events increases the risk for substance use [27]. Maguen et al. (2021) found that combat veterans with exposure to perpetrations of, or witnessing traumatic events, and betrayal increase risks of substance use. Perpetrating moral injury increased the risk of lifetime alcohol use disorder, witnessing increased odds of past-year drug and substance use disorders, while betrayal was associated with past-year alcohol use disorder [27]. Furthermore, Kušen and Strembeck (2023) found that the Vienna terror attack lead to death anxiety in some individuals (increased fear and worry surrounding death) [28].

The long-term impact of trauma and moral injury can have serious consequences. Lamond et al. (2015) discovered that natural disasters, such as flooding, can increase the prevalence of anxiety, increase overall stress levels, and heighten feelings of vulnerabil-

ity [29]. Even exposure to recurrent earthquakes can result in negative health consequences, which tend to increase over time and may be linked to the ongoing, potential recurrent threat [30]. Moreover, Nazarov et al. (2018) considered moral injury in Canadian Armed Forces personnel deployed to Afghanistan and found that more than half of the afflicted noted at least one perceived moral transgression and exhibited a greater likelihood of PTSD and major depressive disorder (MDD) [31]. Additionally, those who felt responsible for the death of a Canadian or ally personnel displayed the greatest association between PTSD and MDD [31]. In studies like these, PTSD can be clearly separated from MDD as a stressor-related disorder triggered by exposure to a traumatic event, whereas depressive symptoms as a potential consequence of PTSD are characterized by intense feelings of sadness, hopelessness and anhedonia. These are set apart from moral injury, which is a moral dilemma with hallmark symptoms of immense guilt and shame. Individuals affected by PTSD may feel on high alert, which is not a dominant feature of moral injury. While individuals with PTSD often suffer from moral injury as well, moral injury is not yet a clinically diagnosable disorder [1–4].

In a study of UK armed forces veterans, clinicians reported moral injury as common amongst this cohort while noting it negatively impacted mental health, that there was a lack of manualized treatment options and that specialized treatments for such ethical and spiritual injuries were lacking [32]. Veterans and military personnel are at particular risk for suffering mental distress due to their occupation and close contact with death, trauma, and loss [32]. Prevention programs and specialized treatment tailored to recovery after moral injury in this population should be prioritized.

The impacts of moral injury are also dependent on age. The use of roughly 300,000 child soldiers around the world exemplifies the damage that can be done through violence and personal moral degradation at a young age [33]. Wong (2021) suggests that moral injury may be higher in youth compared to adult military personnel due to their age and the history of their abduction [34]. Their study of 459 former child soldiers in Liberia showed a higher risk of moral injury in perpetrators, especially perpetrators that were younger, with moderation effects linked to anxiety and negative feelings [34]. Moreover, a historical consideration of German child soldiers from World War II suggested that the number of traumas, recognition by a significant other, and meaningfulness as it relates to a sense of coherence, and a belief that the world is meaningful are significant predictors of post-traumatic growth [35]. Betancourt et al. (2013) studied former child soldiers in Sierra Leone and found high rates of PTSD, which were significantly associated with war experiences and post-conflict family abuse [36]. The researchers go on to suggest that family acceptance offers protective effects, and both family and community support play a vital role in enhancing psychological adjustment [36].

Moral injury is also determined by subjective interpretation of distressing events. A study by Hoffman and Nickerson (2020) assessed the impact of negative appraisals after listening to audio recordings of a vehicle accident and then viewing negative emotional images surrounding the scenario while primed to focus on moral violations by the self, enacted by others, or non-moral factors [37]. They reported that participants who focused on both moral violations had significantly lower physiological arousal, while those with moral violation by self (with lower anxiety levels) showed more sadness, guilt, and intrusions [37]. These results show the importance of moral appraisals and reflection of moral injury. Interestingly, a study eight years after the Wenchuan earthquake suggests that PTSD and post-traumatic growth can co-exist at the same time [19]. This underlines that even when one is suffering from the symptoms of PTSD, there is still the capacity to find meaning in the negative event.

Healthcare providers can also experience moral injury in their workplace. Exposure to ethical violations, such as violation of patient autonomy, improper delivery of medical care, medical harm due to unavoidable, and harmful side effects, can all cause moral injury [38]. Prevention and recovery of moral injury in this setting can be encouraged by advocating for ethical treatment of patients and addressing the ethics of political and

government mandates [38]. The burden of moral injury can be reduced when individuals are empowered with the capacity to make positive impacts and transform negative events into ones with meaning and purpose.

The recent COVID-19 pandemic has introduced neuropsychiatric symptoms due to health and societal concerns, increasing issues with sleep disturbances, fatigue, anxiety, and post-traumatic stress [31]. Additionally, fatigue and cognitive impairment may linger six months after the initial infection [39]. Pietrzak et al. (2021), working with veterans who had screened positive for COVID-19 and associated PTSD symptoms, found post-traumatic growth and improvements in the categories of relating to others, personal strength, and appreciation of life [40]. Frontline healthcare workers have also experienced much greater incidences of mental health consequences, including burnout, emotional exhaustion, and moral injury with the onset of the COVID-19 pandemic [41,42]. However, Feingold et al. (2022) reported moderate or great post-traumatic growth in appreciation of life, improved relationships, and improved personal strength [41]. Further, Menculini et al. (2021) report growth in the general population with females reporting greater levels of post-traumatic growth in the areas of appreciation of life and personal strength compared to males, with many participants reporting no growth [43].

Moral injury may also have a profound impact on physiological pathways, as exemplified through the intricate endocrine processes underlying pregnancy. Research suggests that women suffering from PTSD have higher incidences of preterm birth, preeclampsia, and gestational diabetes [44]. Accordingly, Nillni et al. (2020) suggest that both PTSD and moral injury may significantly increase the likelihood of adverse pregnancy outcomes. Furthermore, PTSD alone may significantly increase the occurrence of post-partum depression, anxiety, and perception of a difficult pregnancy in female military personnel during the first three years after separating from the US military [44]. It is important to consider the impacts of cumulative trauma on pregnancy and birth outcomes given that it is associated with cumulative or chronic activation of the stress response. Severe distress may generate allostatic load, i.e., a burden of cumulative “wear and tear” of tissues by enduring or repeated physiological stress, which has been shown to increase the risk of adverse pregnancy and birth outcomes, including preterm birth [45].

Suicidality is also a concern for those experiencing trauma and disturbing events that challenge one’s internal constitution. Ames et al. (2019) assessed suicide risk in relation to moral injury in active-duty military personnel and veterans [15]. They found that moral injury was common among the cohort and that moral injury was strongly correlated with an increased risk of suicide [15]. The study also found that moral injury was associated with feelings of betrayal, shame, self-condemnations, and loss of faith and hope, all of which were strongly associated with suicide risk [15]. By contrast, research shows that having a strong presence of meaning in life is a protective factor for suicidal ideation [5]. Treatment options should focus on the above-noted feelings and target the internal conflict experienced to help build resilience.

2.2. Post-Traumatic Growth and Recovery

Though suffering from a moral injury can be devastating, there is the potential to take the negative experience and transform it into healing and an improved sense of self. For instance, having an optimistic view of the negative experience acts as a mechanism for future post-traumatic growth [46]. Habib et al. (2018) proposed six themes with post-traumatic growth in military and ex-military personnel: integrating into society, improvement of personal human traits, bonding and connecting with others, appreciation for life, re-evaluating sense of purpose and being proud of heritage and feeling valuable to society [47]. When focusing on these themes, recovery and growth can be heightened. Farnsworth (2019) also suggests the importance of analyzing and clarifying the cognitions surrounding the moral injury is key in treatment planning [48].

Additionally, Owens (2016) studied predictors of post-traumatic growth in undergraduate students who experienced traumatic events [49]. They observed that characteristic

traits of higher extraversion, conscientiousness, agreeableness and attachment avoidance significantly predicted high post-traumatic growth [40]. Moreover, lower neuroticism, attachment anxiety and higher meaning predicted lower post-traumatic stress symptom severity [49]. Personality change and self-reflection may be the foundation of post-traumatic growth [16]. Similarly, among those suffering from psychosis and severe mental illness, post-traumatic growth was present in 83% of recovery narratives, with six notable categories: self-discovery, sense of self, appreciation of life, self-management and well-being, relationships, and religious or spiritual engagement [50]. This research highlights the numerous themes and common factors associated with post-traumatic growth that can be utilized in recovery.

Personalized interventions may facilitate post-traumatic growth. For example, Tedeschi and McNally (2011) suggested that post-traumatic growth can be facilitated by educating affected populations, including veterans, on normal physiological and psychological responses to trauma, encouraging emotional regulation, disclosing traumatic experiences, creating a trauma story with the support of others, and understanding that change may lead to personal strength, new goals, spirituality, and appreciation of living [51]. Zhou and Zhen (2024) reported that social support may act as a buffer for the negative effects of rumination and distraction coping [52]. They also highlight a three-phase model of post-traumatic disorder and growth; namely, the emergency phase (fear and acute stress reactions that challenge existing belief systems) and the impact of social support systems; the coping phase (including rumination, distraction, and deliberate rumination and reappraisal); and lastly the reaction/outcome phase (automatic rumination or distraction and post-traumatic reactions [52]. In order to mitigate these potential adverse effects and maladaptive functioning due to trauma, social supports offer a positive, encouraging interpersonal environment [52].

A great deal of studies of moral injury and post-traumatic growth involve military personnel due to the increased likelihood of experiencing both. Evans et al. (2021) suggests that military personnel suffer from PTSD and moral injuries, causing psychosocial-spiritual suffering and suggests treatment should consider “moral healing” for combat-related suffering, which includes utilizing values-based activities and encouraging embracing moral pain [53]. Bartone and Bowles (2021) conducted a study on severely wounded military men in hospital for their injuries and found that personal hardiness led to post-traumatic growth and a sense of enhanced psychological well-being [54]. The study also found that even though there was severe physical injury, both participants and their spouses showed optimism when it came to greater appreciation for life, new work and educational opportunities, newly formed relationships and stronger family connections [54]. Even with significant personal hardship, there is still the potential for progression and healing. A study of Portuguese war veterans found that participants who had recovered from PTSD exhibited self-awareness of their mental state, higher perceived social support, and more coping strategies [55]. By contrast, those with unrecovered PTSD showed a lack of personal resources, reduced perceived social support, higher postwar betrayal, and social stigmatization [55]. Seol et al. (2021) noted among soldiers in Korea that feelings of an occupational calling in one’s work and personal meaning in one’s personal life are core mechanisms of post-traumatic growth [56].

In a case study of moral injury interventions for veteran populations, chaplains met with veterans for twelve 50 min sessions focusing on moral injury recovery, and two cases showed dramatic improvement in moral injury and PTSD symptoms [1]. Cenkner et al. (2021) also worked with veterans with a history of morally injurious experiences that were provided with interventions by a psychologist and chaplain and partook in a public community healing ceremony [3]. The intervention reduced depressive symptoms and improved psychological functioning and self-compassion [3]. In comparison, a study involving Chinese rescue workers showed that social support helps to mediate the relationship with self-acceptance, post-traumatic growth, and PTSD [57]. Purcell et al. (2018) also suggested that forgiveness is paramount in veterans who feel guilt or shame in their role during

deployment [58]. Treatment plans for such deeply rooted aches in the core of one's being need to consider novel approaches that include a spiritual or existential focus [3]. Medical care frequently crosses cultural boundaries with firmly held beliefs. It has been noted that when a healthcare missionary's values conflict with the values of the community they serve, this may increase the risk of moral injury. Enhancing patient care and reducing the risk of moral injury can be achieved by critically analyzing presumptions and cultural nuances [59,60].

As important as social connectedness is for healing, so is the sharing of past experiences. Social sharing after traumatic events, such as sharing emotions, rumination and intensity of emotions, and coping, results in higher perceived post-traumatic growth, better social integration, and higher perceived hope, contentment, and solidarity [61]. A study of college students with at least one traumatic experience noted that those who reported greater distress, coupled with low reliance on experiential avoidance expressed the greatest growth and meaning of life and those with the least growth reported a strong reliance on experiential avoidance [62]. Thus, tackling avoidance and distress may be crucial factors in facilitating recovery.

Previous reports have highlighted key factors that can predict or mediate traumatic symptoms and growth. A study of 325 children between 10 and 16 years of age affected by the 2010 earthquake in Chile showed that the main predictors of post-traumatic growth and post-traumatic stress symptoms were intrusive and deliberate rumination, disruptive experiences, and losses after the event [63]. Moreover, a study with Syrian refugees in Jordan reported that enhanced well-being was associated with income, health, and the absence of affective disorder [64]. In addition, increased post-traumatic growth was associated with income, non-governmental organizational assistance, and the absence of psychosis and affective disorder [64]. This is important because it highlights the relevance of income stability and appropriate agency support in mental health. Furthermore, a Korean study of earthquake survivors found that post-traumatic growth was higher in married, older, more religious participants, while PTSD was severe in participants who were low in income, married, had no religious affiliation, and had high earthquake exposure [65]. Continuing research in this area can help to create focus in personalized treatment and highlight factors that can be improved upon to encourage progress [66].

Medical illness, such as breast cancer, can also provide evidence of factors associated with post-traumatic growth. A study of women with breast cancer found that rumination in the form of brooding was strongly associated with anxiety, stress, and depression while having a negative mindset related to post-traumatic growth, specifically in the domains of spiritual growth and new possibilities [67]. Soo and Sherman (2015) went on to note that rumination plays an important role in both negative and positive psychological responses to post-traumatic growth [67]. Moreover, post-traumatic growth may also be correlated with years of education, family support, and receiving chemotherapy, while post-traumatic stress symptoms were correlated with chronic pain and poor cognition [68].

It is also important to note that those who work with clients suffering from trauma and moral injury include transference of survivors to their clinicians, countertransference of emotions from the clinician, and secondary trauma with repeated exposure to trauma narratives and accounts [26]. A strong, well-trained clinical team is paramount to survivor recovery. There also needs to be enhanced training to improve hardiness, problem-solving and coping skills, and positive refraining from negative or traumatic experiences can help to promote post-traumatic growth in the aftermath of adversity [54]. This includes targeted training on moral-ethical decisions and post-traumatic growth-focused treatment interventions [31].

3. Conclusions

Moral injury is associated with a wound to one's core principles of right and wrong and damage to conscience, with potentially devastating psychological and somatic consequences. Possible consequences may include feelings of shame, grief, depression, PTSD,

and increased risk of suicide. Conversely, moral injury may also lead to substantial personal growth and improved capacity. It was suggested that trauma survivors may show more significant post-traumatic growth when diagnosed with PTSD than those without this diagnosis [69]. These considerations are timely when developing personalized treatments and interventions to support healthy pregnancy and birth outcomes and a healthy aging trajectory. The acknowledgment of the existence of moral injury among healthcare professionals should have implications for practice, especially patient care provision and healthcare professionals' inner well-being. The present discussion aims to motivate further theoretical and empirical research that inspires clinical solutions. The concept of post-traumatic growth offers a positive outlook on successful recovery from severe distress and PTSD, while providing a framework to aid in the development of effective and personalized resilience-building interventions. It is important to keep in mind that from struggles and darkness, there can be positivity and hope.

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References

1. Ames, D.; Erickson, Z.; Geise, C.; Tiwari, S.; Sakhno, S.; Sones, A.C.; Tyrrell, C.G.; Mackay, C.R.B.; Steele, C.W.; Van Hoof, T.; et al. Treatment of moral injury in U.S. veterans with PTSD using a structured chaplain intervention. *J. Relig. Health* **2021**, *60*, 3052–3060. [[CrossRef](#)] [[PubMed](#)]
2. Boska, R.L.; Dunlap, S.; Kopacz, M.; Bishop, T.M.; Harris, J.I. Understanding moral injury morbidity: A qualitative study examining chaplain's perspectives. *J. Relig. Health* **2021**, *60*, 3090–3099. [[CrossRef](#)]
3. Cenken, D.P.; Yeomans, P.D.; Antal, C.J.; Scott, J.C. A pilot study of a moral injury group intervention co-facilitated by a chaplain and psychologist. *J. Trauma. Stress* **2021**, *34*, 367–374. [[CrossRef](#)]
4. Lindert, J. Moral injury and moral distress. *Eur. J. Public Health* **2021**, *31* (Suppl. 3). [[CrossRef](#)]
5. Kelley, M.L.; Chae, J.W.; Bravo, A.J.; Milam, A.L.; Agha, E.; Gaylord, S.A.; Vinci, C.; Currier, J.M. Own soul's warning: Moral injury, suicidal ideation, and meaning in life. *Psychol. Trauma* **2021**, *13*, 740–748. [[CrossRef](#)] [[PubMed](#)]
6. Chesnut, R.P.; Richardson, C.B.; Morgan, N.R.; Bleser, J.A.; Perkins, D.F.; Vogt, D.; Copeland, L.A.; Finley, E. Moral injury and social well-being: Agrowth curve analysis. *J. Trauma. Stress* **2020**, *33*, 587–597. [[CrossRef](#)]
7. Litz, B.T.; Stein, N.; Delaney, E.; Lebowitz, L.; Nash, W.P.; Silva, C.; Maguen, S. Moral injury and moral repair in war veterans: A preliminary model and intervention strategy. *Clin. Psychol. Rev.* **2009**, *29*, 695–706. [[CrossRef](#)]
8. Currier, J.M.; Farnsworth, J.K.; Drescher, K.D.; McDermott, R.C.; Sims, B.M.; Albright, D.L. Development and evaluation of the Expressions of Moral Injury Scale—Military Version. *Clin. Psychol. Psychother.* **2018**, *25*, 474–488. [[CrossRef](#)]
9. Olson, D.M.; Brémault-Phillips, S.; King, S.; Metz, G.A.S.; Montesanti, S.; Olson, J.K.; Hyde, A.; Pike, A.; Hoover, T.; Linder, R.; et al. Recent Canadian efforts to develop population-level pregnancy intervention studies to mitigate effects of natural disasters and other tragedies. *J. Dev. Orig. Health Dis.* **2019**, *10*, 108–114. [[CrossRef](#)] [[PubMed](#)]
10. Olson, D.M.; Metz, G.A.S. Climate change is a major stressor causing poor pregnancy outcomes and child development. *F1000 Research* **2020**, *9*, 1222. [[CrossRef](#)]
11. Faraji, J.; Metz, G.A.S. Aging, social distancing, and COVID-19 risk: Who is more vulnerable and why? *Aging Dis.* **2021**, *12*, 1624–1643. [[CrossRef](#)]
12. Szymkowitz, S.M.; Gerlach, A.R.; Homiack, D.; Taylor, W.D. Biological factors influencing depression in later life: Role of aging processes and treatment implications. *Transl. Psychiatry* **2023**, *13*, 160. [[CrossRef](#)] [[PubMed](#)]
13. Ambeskovic, M.; Ilnytsky, Y.; Kiss, D.; Currie, C.; Montana, T.; Kovalchuk, I.; Metz, G.A.S. Ancestral stress programs sex-specific biological aging trajectories and non-communicable disease risk. *Aging* **2020**, *12*, 3828–3847. [[CrossRef](#)] [[PubMed](#)]

14. Ambeskovic, M.; Roseboom, T.J.; Metz, G.A.S. Transgenerational effects of early environmental insults on aging and disease incidence. *Neurosci. Biobehav. Rev.* **2020**, *117*, 297–316. [[CrossRef](#)]
15. Ames, D.; Erickson, Z.; Youssef, N.A.; Arnold, I.; Adamson, C.S.; Sones, A.C.; Yin, J.; Haynes, K.; Volk, F.; Teng, E.J.; et al. Moral injury, religiosity, and suicide risk in U.S. veterans and active duty military with PTSD symptoms. *Mil. Med.* **2019**, *184*, e271–e278. [[CrossRef](#)]
16. Jayawickreme, E.; Infurna, F.J.; Alajak, K.; Blackie, L.E.R.; Chopik, W.J.; Chung, J.M.; Dorfman, A.; Fleeson, W.; Forgeard, M.J.C.; Frazier, P.; et al. Post-traumatic growth as positive personality change: Challenges, opportunities, and recommendations. *J. Personal.* **2021**, *89*, 145–165. [[CrossRef](#)]
17. Zięba, M.; Wiecheć, K.; Biegańska-Banaś, J.; Mieleśczenko-Kowszewicz, W. Coexistence of post-traumatic growth and post-traumatic depreciation in the aftermath of trauma: Qualitative and quantitative narrative analysis. *Front. Psychol.* **2019**, *10*, 687. [[CrossRef](#)]
18. Morrill, E.F.; Brewer, N.T.; O'Neill, S.C.; Lillie, S.E.; Dees, E.C.; Carey, L.A.; Rimer, B.K. The interaction of post-traumatic growth and post-traumatic stress symptoms in predicting depressive symptoms and quality of life. *Psycho-Oncology* **2008**, *17*, 948–953. [[CrossRef](#)] [[PubMed](#)]
19. Guo, J.; Fu, M.; Xing, J.; Qu, Z.; Wang, X. Coping style and posttraumatic growth among adult survivors 8 years after the 2008 Wenchuan earthquake in China. *Personal. Individ. Differ.* **2017**, *111*, 31–36. [[CrossRef](#)]
20. Tedeschi, R.G.; Calhoun, L.G. The posttraumatic growth inventory: Measuring the positive legacy of trauma. *J. Trauma. Stress* **1996**, *9*, 455–471. [[CrossRef](#)]
21. Park, C.L.; Cohen, L.H.; Murch, R.L. Assessment and prediction of stress-related growth. *J. Personal.* **1996**, *64*, 71–105. [[CrossRef](#)] [[PubMed](#)]
22. Joseph, S.; Linley, P.A. Positive adjustment to threatening events: An organismic valuing theory of growth through adversity. *Rev. Gen. Psychol.* **2005**, *9*, 262–280. [[CrossRef](#)]
23. Shakespeare-Finch, J.; Lurie-Beck, J. A meta-analytic clarification of the relationship between posttraumatic growth and symptoms of posttraumatic distress disorder. *J. Anxiety Disord.* **2014**, *28*, 223–229. [[CrossRef](#)] [[PubMed](#)]
24. Helgeson, V.S.; Reynolds, K.A.; Tomich, P.L. A meta-analytic review of benefit finding and growth. *J. Consult. Clin. Psychol.* **2006**, *74*, 797–816. [[CrossRef](#)]
25. Hall, N.A.; Everson, A.T.; Billingsley, M.R.; Miller, M.B. Moral injury, mental health, and behavioral health outcomes: A systematic review of the literature. *Clin. Psychol. Psychother.* **2021**, *29*, 92–110. [[CrossRef](#)]
26. Shay, J. Moral injury. *Psychoanal. Psychol.* **2014**, *31*, 182–191. [[CrossRef](#)]
27. Maguen, S.; Nichter, B.; Norman, S.B.; Pietrzak, R.H. Moral injury and substance use disorders among US combat veterans: Results from the 2019–2020 National Health and Resilience in Veterans Study. *Psychol. Med.* **2021**, *53*, 1364–1370. [[CrossRef](#)]
28. Kušen, E.; Strembeck, M. Short- and long-term impact of psychological distance on human responses to a terror attack. *Online Soc. Netw. Media* **2023**, *33*, 100243. [[CrossRef](#)]
29. Lamond, J.E.; Joseph, R.D.; Proverbs, D.G. An exploration of factors affecting the long term psychological impact and deterioration of mental health in flooded households. *Environ. Res.* **2015**, *140*, 325–334. [[CrossRef](#)]
30. Stroebe, K.; Kanis, B.; Richardson, J.; Oldersma, F.; Broer, J.; Greven, F.; Postmes, T. Chronic disaster impact: The long-term psychological and physical health consequences of housing damage due to induced earthquakes. *Br. Med. J. Open* **2021**, *11*, e040710. [[CrossRef](#)]
31. Nazarov, A.; Fikretoglu, D.; Liu, A.; Thompson, M.; Zamorski, M.A. Greater prevalence of post-traumatic stress disorder and depression in deployed Canadian Armed Forces personnel at risk for moral injury. *Acta Psychiatr. Scand.* **2018**, *137*, 342–354. [[CrossRef](#)] [[PubMed](#)]
32. Williamson, V.; Greenberg, N.; Murphy, D. Moral injury in UK armed forces veterans: A qualitative study. *Eur. J. Psychotraumatol.* **2019**, *10*, 1562842. [[CrossRef](#)] [[PubMed](#)]
33. Wainryb, C. And so they ordered me to kill a person: Conceptualizing the impacts of child soldiering on the development of moral agency. *Hum. Dev.* **2011**, *54*, 273–300. [[CrossRef](#)]
34. Wong, P.H. Moral injury in former child soldiers in Liberia. *J. Child Adolesc. Trauma* **2021**, *15*, 847–856. [[CrossRef](#)] [[PubMed](#)]
35. Forstmeier, S.; Kuwert, P.; Spitzer, C.; Freyberger, H.J.; Maercker, A. Posttraumatic growth, social acknowledgment as survivors, and sense of coherence in former German child soldiers of World War II. *Am. J. Geriatr. Psychiatry* **2009**, *17*, 1030–1039. [[CrossRef](#)]
36. Betancourt, T.S.; Newnham, E.A.; McBain, R.; Brennan, R.T. Post-traumatic stress symptoms among former child soldiers in Sierra Leone: Follow-up study. *Br. J. Psychiatry* **2013**, *203*, 196–202. [[CrossRef](#)]
37. Hoffman, J.; Nickerson, A. The impact of moral-based appraisals on psychological outcomes in response to analogue trauma: An experimental paradigm of moral injury. *Cogn. Ther. Res.* **2020**, *45*, 494–507. [[CrossRef](#)]
38. Heston, T.F.; Pahang, J.A. Moral injury and the four pillars of bioethics. *F1000 Research* **2023**, *8*, 1193. [[CrossRef](#)]
39. Badenoch, J.B.; Rengasamy, E.R.; Watson, C.; Jansen, K.; Chakraborty, S.; Sundaram, R.D.; Hafeez, D.; Burchill, E.; Saini, A.; Thomas, L.; et al. Persistent neuropsychiatric symptoms after COVID-19: A systematic review and meta-analysis. *Brain Commun.* **2021**, *4*, fcab297. [[CrossRef](#)]
40. Pietrzak, R.H.; Tsai, J.; Southwick, S.M. Association of symptoms of posttraumatic stress disorder with posttraumatic psychological growth among US veterans during the COVID-19 pandemic. *JAMA Netw. Open* **2021**, *4*, e214972. [[CrossRef](#)]

41. Feingold, J.H.; Hurtado, A.; Feder, A.; Peccoralo, L.; Southwick, S.M.; Ripp, J.; Pietrzak, R.H. Posttraumatic growth among health care workers on the frontlines of the COVID-19 pandemic. *J. Affect. Disord.* **2022**, *296*, 35–40. [\[CrossRef\]](#) [\[PubMed\]](#)
42. Sales, P.M.G.; Arshed, A.; Cosmo, C.; Li, P.; Garrett, M.; Cohen, M.A. Burnout and moral injury among consultation-liaison psychiatry trainees. *Psychodyn. Psychiatry* **2021**, *49*, 543–561. [\[CrossRef\]](#)
43. Menculini, G.; Albert, U.; Bianchini, V.; Carmassi, C.; Carrà, G.; Cirulli, F.; Dell’osso, B.; Fabrazzo, M.; Perris, F.; Sampogna, G.; et al. Did we learn something positive out of the COVID-19 pandemic? Post-traumatic growth and mental health in the general population. *Eur. Psychiatry* **2021**, *64*, E79. [\[CrossRef\]](#)
44. Nillni, Y.I.; Shayani, D.R.; Finley, E.; Copeland, L.A.; Perkins, D.F.; Vogt, D.S. The impact of posttraumatic stress disorder and moral injury on women veterans’ perinatal outcomes following separation from military service. *J. Trauma. Stress* **2020**, *33*, 248–256. [\[CrossRef\]](#) [\[PubMed\]](#)
45. Olson, D.M.; Severson, E.M.; Verstraeten, B.S.; Ng, J.W.; McCreary, J.K.; Metz, G.A.S. Allostatic load and preterm birth. *Int. J. Mol. Sci.* **2015**, *16*, 29856–29874. [\[CrossRef\]](#) [\[PubMed\]](#)
46. Jayawickreme, E.; Blackie, L.E.R. Post-traumatic growth as positive personality change: Evidence, controversies and future directions. *Eur. J. Personal.* **2014**, *28*, 312–333. [\[CrossRef\]](#)
47. Habib, A.; Stevelink, S.A.M.; Greenberg, N.; Williamson, V. Post-traumatic growth in (ex-) military personnel: Review and qualitative synthesis. *Occup. Med.* **2018**, *68*, 617–625. [\[CrossRef\]](#)
48. Farnsworth, J.K. Is and ought: Descriptive and prescriptive cognitions in military-related moral injury. *J. Trauma. Stress* **2019**, *32*, 373–381. [\[CrossRef\]](#)
49. Owens, G.P. Predictors of posttraumatic growth and posttraumatic stress symptom severity in undergraduates reporting potentially traumatic events. *J. Clin. Psychol.* **2016**, *72*, 1064–1076. [\[CrossRef\]](#)
50. Slade, M.; Rennick-Egglestone, S.; Blackie, L.; Llewellyn-Beardsley, J.; Franklin, D.; Hui, A.; Thornicroft, G.; McGranahan, R.; Pollock, K.; Priebe, S.; et al. Post-traumatic growth in mental health recovery: Qualitative study of narratives. *Br. Med. J. Open* **2019**, *9*, e029342. [\[CrossRef\]](#)
51. Tedeschi, R.G.; McNally, R.J. Can we facilitate posttraumatic growth in combat veterans? *Am. Psychol.* **2011**, *66*, 19–24. [\[CrossRef\]](#)
52. Zhou, X.; Zhen, R. A three-phase process model of posttraumatic stress disorder and growth: Understanding the mechanisms underlying posttraumatic reactions. *Psychol. Trauma Theory Res. Pract. Policy* **2024**, *16*, 1033–1043. [\[CrossRef\]](#) [\[PubMed\]](#)
53. Evans, W.R.; Russell, L.H.; Hall-Clark, B.N.; Fina, B.A.; Brown, L.A.; Foa, E.B.; Peterson, A.L.; For the Consortium to Alleviate PTSD. Moral injury and moral healing in prolonged exposure for combat-related PTSD: A case study. *Cogn. Behav. Pract.* **2021**, *28*, 210–223. [\[CrossRef\]](#)
54. Bartone, P.T.; Bowles, S.V. Hardiness predicts post-traumatic growth and well-being in severely wounded servicemen and their spouses. *Mil. Med.* **2021**, *186*, 500–504. [\[CrossRef\]](#) [\[PubMed\]](#)
55. Ferrajão, P.C.; Aragão Oliveira, R. Portuguese war veterans: Moral injury and factors related to recovery from PTSD. *Qual. Health Res.* **2016**, *26*, 204–214. [\[CrossRef\]](#)
56. Seol, J.H.; Park, Y.; Choi, J.; Sohn, Y.W. The mediating role of meaning in life in the effects of calling on posttraumatic stress symptoms and growth: A longitudinal study of navy soldiers deployed to the Gulf of Aden. *Front. Psychol.* **2021**, *11*, 599109. [\[CrossRef\]](#)
57. Zhao, Y.; An, Y.; Sun, X.; Liu, J. Self-acceptance, post-traumatic stress disorder, post-traumatic growth, and the role of social support in Chinese rescue workers. *J. Loss Trauma* **2020**, *25*, 264–277. [\[CrossRef\]](#)
58. Purcell, N.; Griffin, B.J.; Burkman, K.; Maguen, S. “Opening a door to a new life”: The role of forgiveness in healing from moral injury. *Front. Psychiatry* **2018**, *9*, 498. [\[CrossRef\]](#)
59. Molendijk, T.; Verkoren, W.; Drogendijk, A.; Elands, M.; Kramer, E.H.; Smit, A.; Verweij, D. Contextual dimensions of moral injury: An interdisciplinary review. *Mil. Psychol.* **2022**, *34*, 742–753. [\[CrossRef\]](#)
60. Pyne, J.M.; Currier, J.; Hinkson, K.D., Jr.; Usse, T.J.; Abeit, L.A.; Dordal, P.; Kouser, T.; Awaad, R.; Weber, M.C.; Griffin, B.J. Addressing religious and spiritual diversity in moral injury care: Five perspectives. *Curr. Treat. Options Psychiatry* **2023**, *10*, 446–462. [\[CrossRef\]](#)
61. Rimé, B.; Páez, D.; Basabe, N.; Martínez, F. Social sharing of emotion, post-traumatic growth, and emotional climate: Follow-up of Spanish citizen’s response to the collective trauma of March 11th terrorist attacks in Madrid. *Eur. J. Soc. Psychol.* **2010**, *40*, 1029–1045. [\[CrossRef\]](#)
62. Kashdan, T.B.; Kane, J.Q. Post-traumatic distress and the presence of post-traumatic growth and meaning in life: Experiential avoidance as a moderator. *Personal. Individ. Differ.* **2011**, *50*, 84–89. [\[CrossRef\]](#) [\[PubMed\]](#)
63. Andrades, M.; García, F.E.; Kilmer, R.P. Post-traumatic stress symptoms and post-traumatic growth in children and adolescents 12 months and 24 months after the earthquake and tsunamis in Chile in 2010: A longitudinal study. *Int. J. Psychol.* **2021**, *56*, 48–55. [\[CrossRef\]](#)
64. Rizkalla, N.; Segal, S.P. Well-being and posttraumatic growth among Syrian refugees in Jordan. *J. Trauma. Stress* **2018**, *31*, 213–222. [\[CrossRef\]](#)
65. Seo, H.; Lee, O. Mediating role of post-traumatic stress disorder in post-traumatic growth in adults who experienced the 2017 Pohang earthquake. *J. Affect. Disord.* **2020**, *263*, 246–251. [\[CrossRef\]](#)
66. Vermetten, E.; Jones, C.; Smith MacDonald, L.; Ter Heide, J.J.; Greenshaw, A.J.; Brémault-Phillips, S. Editorial: Emerging treatments and approaches for moral injury and moral distress. *Front. Psychiatry* **2023**, *14*, 1125161. [\[CrossRef\]](#) [\[PubMed\]](#)

67. Soo, H.; Sherman, K.A. Rumination, psychological distress and post-traumatic growth in women diagnosed with breast cancer. *Psycho-Oncology* **2015**, *24*, 70–79. [[CrossRef](#)]
68. Chen, H.-M.; Chen, V.C.-H.; Hsiao, H.-P.; Weng, Y.-P.; Hsu, Y.-T.; Weng, J.-C.; Su, J.-A.; Chen, Y.-L. Correlations and correlates of post-traumatic growth and post-traumatic stress symptoms in patients with breast cancer. *Neuropsychiatr. Dis. Treat.* **2019**, *15*, 3051–3060. [[CrossRef](#)]
69. Schubert, C.F.; Schmidt, U.; Rosner, R. Posttraumatic growth in populations with posttraumatic stress disorder—A systematic review on growth-related psychological constructs and biological variables. *Clin. Psychol. Psychother.* **2016**, *23*, 469–486. [[CrossRef](#)]

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