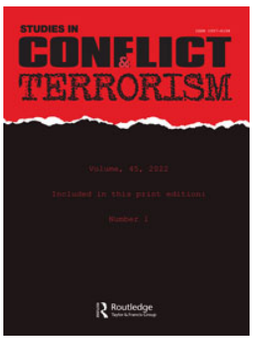

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The Relationship between of Moral Injury and Radicalisation: A Systematic Review

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ABSTRACT

This review aimed to explore individual-level factors involved in radicalization and the impact of moral injury on an individual's beliefs and behaviors that are relevant to radicalization. The results indicate that both individuals who develop radical beliefs and those with moral injury are exposed to events which provoke similar adverse outcomes, including a loss of personal significance, suggesting that moral injury could be a useful way to understand the process of radicalization. Understanding the processes involved in moral injury may inform preventative programs, as well programs to promote disengagement from radical action in those who have already been radicalized.

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Introduction

Increasing research attention has focused on the impact of potentially morally injurious events (PMIEs) on wellbeing, particularly in the context of armed conflict. PMIEs are not limited to any particular profession and have been defined as "perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations" [1]. Studies have largely focused on PMIEs where the individual was either a perpetrator, a witness, or experienced a betrayal by a trusted authority [2].

PMIEs may lead to *moral injury* which is characterized by self-condemnation, guilt, anger and shame [3]. Whatever the nature of the PMIE, whether an act of commission or omission, it is not thought that it is the event itself that is key in the development of psychological problems following moral injury. Instead, it is the way in which an individual appraises the event and their attempts to find a meaning to what happened that is central. Experiences of PMIEs can contribute toward the development of moral injury via altered cognitions relating to oneself, others or the world (e.g. 'I am a terrible person,' 'the world is an evil place'). Individuals with moral injury may also

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act out of character, including having interpersonal difficulties (e.g. withdrawal, hostility, difficulty trusting others), having spiritual or existential crises (e.g. loss of faith, loss of sense of self or one's life having a purpose), or engaging in risk-taking behaviors [4]. Whilst it is expected that most people recover from moral injuries, some may develop mental health problems. For example, recent studies have found that a significant proportion of military personnel who report exposure to PMIEs experience symptoms of posttraumatic stress disorder (PTSD), suicidal ideation, anxiety and depression [5]. However, it is notable that some individuals who experience a PMIE also report experiencing no psychological change following the event or even positive changes, such as post-traumatic growth [6]. This serves to highlight the importance of understanding the role of meaning making post-PMIE.

Armed conflict remains a leading driver of terrorism across the globe with the significant majority of all terrorist-related deaths occurring in countries involved in a violent conflict [7]. However, Europe has witnessed the rise of the lone actor terrorist, individuals not directly engaged with groups but motivated largely by the internet and social media contacts, together with the rise of an increasing number of extreme right-wing groups [8]. Returning foreign terrorist fighters, those who have been brutalized by combat overseas and received military training, are considered a particular risk [9]. Radicalization may also occur by other means in different contexts. For example, in both Western and non-Western contexts, radicalization and recruitment to extremist groups has been found to occur in prison environments [10]. A notable instance of this in a non-Western context is the numerous attacks carried out by Al-Qaeda and the Taliban which are understood to have originated from within Afghan prisons, where radicalized extremists were able to mix freely with 'ordinary' criminals and instances of radicalization were reportedly frequent [11]. Other research highlights that the key role that poverty and unemployment plays in recruitment to radicalized groups in non-Western communities, with a recent study finding that employment was the single most frequently cited 'immediate need' faced by former recruits of multiple violent extremist groups across Africa at the time of joining [12]. Furthermore, for children and young people in particular, evidence indicates that geographical proximity to conflict, economic hardship, and political or social marginalization are factors that increase vulnerability to recruitment by radical organizations [13].

The term 'radicalization' refers to the process of developing extremist ideologies and/or beliefs. While multiple theories exist, some research investigating the process of radicalization hypothesizes that one of the main driving forces in the process is a '*quest for significance*'[14]. This refers to violent extremism being perceived as the most effective way to restore personal feelings of insignificance generated by a grievance or loss suffered by an individual or a group. For example, previous studies suggest that carrying out an act of violence on behalf of one's group or religion can elevate one's sense of importance and meaning [15]. Factors such as feelings of shame, insignificance, perceived alienation from larger society, personal uncertainty and a need for belonging can act as push factors that drive individuals toward radicalization [16]. Similarly, another theory of radicalization, the uncertain identity theory [17] suggests that individuals are highly motivated to reduce self-uncertainty, including uncertainty about their life, their future, and their identity. When self-uncertainty becomes chronic, pervasive, or acute,

people are strongly attracted to extremist groups, because they prescribe a clear prototype for how one should behave, think, and feel in all situations, and how to behave toward out-group members [18]. Other theories of the process of radicalization also highlight that factors including experiences of peer pressure, a need for status, or seeking the thrill or sense of adventure from joining a counter cultural organization can similarly be push factors [19].

Notably, several of the underlying principles of radicalization appear similar to those of moral injury. For example, there is evidence that individuals at risk of adopting radical beliefs or those experiencing a moral injury may be exposed to similar types of sensitizing incidents, such as victimization and perceived betrayal that evoke emotions including anger and shame. Recruiters to terrorist organizations often seek to exploit legitimate grievances and frame their message in terms of helping disadvantaged minorities. A recent study of IRA terrorists found evidence of morally injurious experiences and symptoms, and moral disillusionment with the terrorist organization [20]. PMIEs also produce comparable deleterious outcomes in both populations such as a loss of personal significance, questioning of identity and disillusionment with organizations perceived as to blame for the event. Thus, moral injury and radicalization may share similar risk and protective factors. It follows that deradicalisation programs could potentially benefit from incorporating understanding of the mechanisms that underpin moral injury and its impact on beliefs and behaviors to inform prevention of further radicalization of vulnerable individuals.

This systematic review aimed to provide a narrative synthesis of the existing moral injury literature to explore whether individual differences may impact susceptibility and resilience to moral injury, and the impact of moral injury on an individual's beliefs and behaviors that are relevant to radicalization. As the impact of PMIE type on mental health has recently been examined in other recent reviews (e.g. [21]), this was not examined in the present study.

Method

Search Strategy

Electronic literature databases were searched between December 2019 – March 2020, including PsycInfo, EMBASE, MEDLINE, PubMed, Google Scholar, PILOTS and Web of Science. This search was carried out again in October-November 2020. Search terms included key words for moral injury and radicalization. Searches for moral injury and radicalization manuscripts were carried out separately. Reference lists of relevant review articles, book chapters and issues of journals (e.g. European Journal of Psychotraumatology, Journal of Studies in Conflict & Terrorism, Journal of Terrorism and Political Violence) were also manually searched for eligible studies.

Eligibility

To be considered for inclusion, studies had to include an assessment of moral injury using a standardized measure; quantitatively examine individual differences for moral injury development; quantitatively examine the process or motivations for radicalization;

or evaluate the effectiveness of an intervention program for extremist group members. Studies were excluded on the following grounds:

a. study participants were aged <18 years;
b. studies not written in English;
c. single case studies;
d. articles not presenting new data or only presented qualitative analysis; or
e. conference abstracts, PhD dissertations where additional information or published versions could not be obtained.

A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart (Figure 1) describes the systematic review process. On two occasions, studies

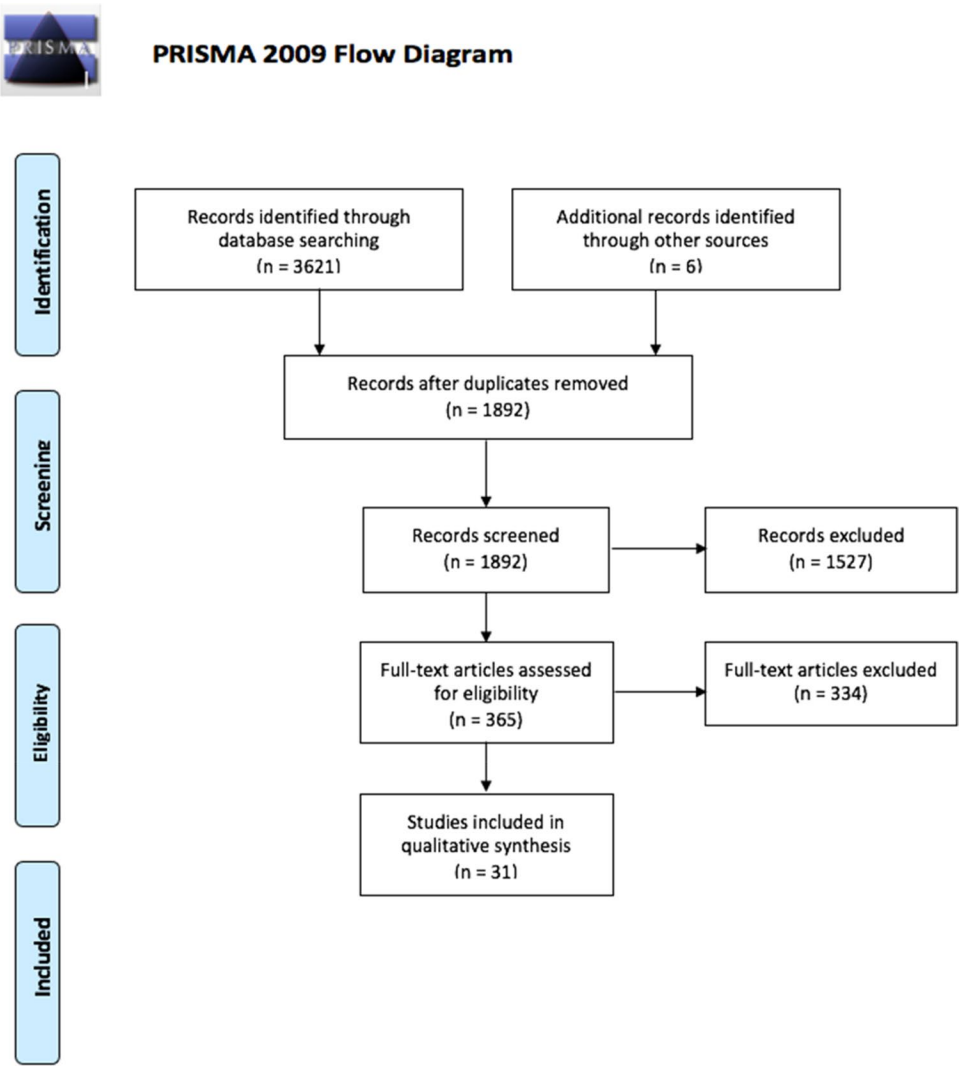

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram.

were excluded as corresponding authors were not able to provide additional data [22]. On three occasions, the same data were reported in more than one article. When this occurred, results from the most comprehensive article were used. 31 studies met the criteria for inclusion in this review.

Data Extraction

The following data were extracted from each study, where available: (a) study information (e.g. author name, study design, location); (b) participant demographic information (e.g. age, sample type [e.g. military, nonmilitary], gender distribution, ethnicity); (c) study response and retention rates; (d) radical organization membership; (e) measure used to assess moral injury; (f) time since PMIE; (g) factors targeted by deradicalisation program; (h) findings and effect sizes; (i) ethical issues; (j) and sources of bias. Extracted data were independently assessed by two authors (SA, VW). Any discrepancies were checked and successfully resolved.

Study Quality

The methodological quality of studies was independently assessed by two authors (VW, SA) using a 14-item checklist (NIH, 2014). The highest possible score was 14, indicative of a better-quality study, with zero as the lowest possible score. Studies were scored on the extent to which specific criteria were met ('no' = 0, 'yes' = 1) and a summary score was calculated by summing the total score across all items of the scale. Agreement between authors was strong, with any disagreements resolved in a consensus meeting.

Data Synthesis

Individual differences in susceptibility and resilience to moral injury and radicalization were a key outcome explored in this review. The impact of moral injury on an individual's beliefs and behaviors that are relevant to radicalization was also explored. For both moral injury and radicalization study outcomes, significance tests and effect sizes were extracted from the data. Where possible, we used Pearson's product-moment correlation (r) as the effect size because r is more readily interpretable compared to other effect sizes and is easily computed from t, F and d. We extracted effect size values for each association of interest within each study. Where a study reported outcomes of multiple samples but no population correlation coefficient, the correlation coefficients of the largest sample reported were used.

A small number of studies only reported the absence of statistical significance (e.g. "the findings were not statistically significant"). As these cases represent effects that did not reach statistical significance, excluding these studies could potentially result in an upwardly biased review [23]. To avoid this, when results from a study were reported as not significant and F or t values were not available, a random number between the range of critical values of F or t at $p = 0.05$ was selected using a random number generator to calculate an estimate of effects [24].

Results

This review included 31 studies, 21 of which investigated moral injury (see Table 1) and 10 examined radicalization (see Table 2). None of the included studies investigated both moral injury and radicalization.

Across the 31 studies, the mean age of all participants was 35.4 years old (SD =11.1); radicalization $M = 28.1$, SD =6.5; Moral Injury $M = 38.9$, SD =11.3) and 78.3% of the overall sample were male (radicalization =65.8%, Moral Injury =83.9%). A cross-sectional design was used in most studies (Moral Injury $n = 21$, radicalization $n = 4$). Most of the moral injury studies included military samples ($n = 20$), while the majority of the radicalization studies investigated detained extremists ($n = 6$). The majority of the moral injury studies were carried out the USA (66.6%). Conversely, most of the studies which considered radical extremism were conducted in a wider distribution of locations, with the most common being Indonesia and Israel.

Individual Differences in Susceptibility and Resilience to Moral Injury Meaning Made of Event

Five moral injury studies investigated the role of meaning making of the event in the development of moral injury-related distress.

Two studies found a potentially protective effect of adaptive meaning making after PMIEs. Evans et al. [25] found that individuals reported experiencing significantly more post-traumatic growth – or positive psychological change - after MI-Self events ($r = 0.18$, $p < 0.05$) compared to those who experienced MI-Other ($r = 0.04$, $p > 0.05$) or perceived betrayal events ($r = 0.02$, $p > 0.05$), with greater post-traumatic growth, in turn, significantly associated with greater life satisfaction ($r = 0.36$, $p < 0.001$, data not shown in table). However, this study is limited by its lack of examination of a relationship between PMIE exposure and posttraumatic growth on other mental health outcomes, such as PTSD. Meanwhile, Ferrajao & Oliveira [26] found that self-integration of moral injury in personal schemas was potentially a key process in adaptively coping following PMIEs, with higher levels of integration significantly negatively associated with symptoms of PTSD and depression.

Three studies demonstrated that the difficulties making meaning of PMIEs was associated with moral injury and/or experiences of moral injury-related distress (see Table 3). Currier, Holland and Malott [27] found difficulties making adaptive meaning of PMIEs (e.g. problems integrating the event into ones understanding of the world) significantly increased the probability of poor mental health outcomes, with less meaning making associated with higher levels of PTSD (r=-0.69; $p < 0.001$), depression (r=-0.53, $p < 0.001$) and risk of suicide (r=-0.35, $p < 0.001$). Currier et al. [28] observed a similar effect in a nonmilitary sample of teachings from El Salvador in the ability to make meaning of PMIEs experienced in their occupational role and found that this was associated with PTSD symptoms (see Table 3). Finally, maladaptive meaning making, including especially negative beliefs about the self, others and the world following the PMIE, was found by Held et al. to be significantly associated with PMIE exposure, notably following perceived betrayal events (data not shown in table)[29], with

Table 1. Included studies examining moral injury, sample characteristics, methods of assessment and quality rating.

	Study	Year	Design	*N*	Location	Males (%)	Mean age (years)	PMIE exposure type	Military/ civilian	Outcomes assessed	Quality rating
1.	Ames et al.	2019	Cross-sectional	570	USA	NR	51.3	PMIE exposure	Military	PTSD, suicide risk, demographic characteristics, spiritual injury	9
2.	Battles et al.	2019	Cross-sectional	380	USA	68.4	35.3	PMIE exposure	Military	Substance use, spiritual injury, demographic characteristics	8
3.	Battaglia et al.	2019	Cross-sectional	33	Canada	87.9	44.7	MI-S, MI-PB,	Military	PTSD, childhood adversity	9
4.	Currier, Holland & Malott	2015	Cross-sectional	131	USA	98.3	28.5	PMIE exposure	Military	Depression, suicide risk, PTSD, meaning making	8
5.	Currier et al.	2015	Cross-sectional	257	El Salvador	31.4	42.0	PMIE exposure	Civilian	PTSD, work-related burnout, meaning making, demographic characteristics	9
6.	Currier, Foster & Isaak[a]	2019	Cross-sectional	616	USA	82.3	NR	MI-S, MI-O	Military	Spiritual injury, struggles with meaning of life, interpersonal difficulties	10
7.	Evans et al.	2018	Cross-sectional	155	USA	86.2	50.0	MI-O, MI-S	Military	Posttraumatic growth, life satisfaction	8
8.	Forkus, Breines & Weiss	2019	Cross-sectional	203	USA	77.3	35.1	MI-S, MI-O, MI-PB	Military	Depression, PTSD, self-harm, self-compassion	9
9.	Ferrajao & Oliveira	2014	Cross-sectional	60	Portugal	100.0	64.0	PMIE exposure	Military	Depression, PTSD, self-integration of MI into personal schema, social support	8
10.	Feingold, Zerach & Levi-Belz[b]	2019	Cross-sectional	191	Israel	85.4	25.4	MI-S, MI-O, MI-PB	Military	PTSD, depression, substance misuse, social support	11
11.	Held et al.	2017	Cross-sectional	121	USA	66.1	39.4	MI-S, MI-O, MI-PB	Military	PTSD, depression, negative post trauma cognitions	8
12.	Hellenthal et al.	2017	Cross-sectional	191	Germany	92.0	29.0	MI-S, MI-O	Military	Personal values	9
13.	Jinkerson & Battles	2019	Cross-sectional	72	USA	87.5	NR	PMIE exposure	Military	Depression, PTSD, anxiety, loss of subjective meaning	9
14.	Kopacz et al.	2019	Cross-sectional	84	USA	97.6	48.5	MI-S, MI-O, MI-PB	Military	Spiritual injury	6
15.	Kelley et al.	2019	Cross-sectional	189	USA	96.8	43.1	MI-S, MI-O	Military	Suicidality, self-compassion, social support, mindfulness, demographic characteristics	9
16.	Lancaster & Miller	2019	Cross-sectional	120	USA	85.0	34.5	MI-S, MI-O	Military	Religious strain, trait altruism	9
17.	Levi-Belz, Dichter, & Zerach[b]	2020	Cross-sectional	191	Israel	88.0	25.4	MI-S, MI-O, MI-PB	Military	PTSD, depression, suicidal ideation, self-forgiveness	11
18.	Martin et al.	2017	Cross-sectional	562	USA	83.8	28.7	MI-PB	Military	Aggression, thwarted belongingness	10
19.	Williams & Berenbaum	2019	Cross-sectional	50	USA	92.0	32.7	MI-S, MI-O	Military	Altered world views	
20.	Youssef et al.	2018	Cross-sectional	120	USA	86.4	55.6	PMIE exposure	Military	PTSD, substance use, religious involvement, demographic characteristics	9
21.	Zerach & Levi-Belz[b]	2019	Cross-sectional	191	Israel	85.4	25.4	MI-O, MI-S	Military	PTSD, depression, suicidal ideation, intolerance of uncertainty, demographic characteristics	11

Note. MI = Moral injury, MIE = morally injurious event, PMIE = potentially morally injurious event, PMIE exposure = study examined exposure to PMIEs but authors did not report the specific PMIE types experienced, TE = traumatic event, PTE = potentially traumatic event MI-O = morally injurious event perpetrated by other, MI-S = morally injurious event perpetrated by self, MI-PB = morally injurious event involving perceived betrayal, PTSD = posttraumatic stress disorder. a = effect size reflects sample 1reported by this study (n = 616). b = studies report data from a sample of 191 Israeli veterans with all variables of interest not reported by a single study. Therefore, for this review, data from Feingold et al. [96] was extracted relating to PMIE outcomes and social support, data from Levi-Belz et al. [97] was extracted relating to PMIE outcomes and self-forgiveness, and data from Zerach et al. [98] was extracted relating to PMIE outcomes, demographic characteristics and intolerance of uncertainty.

Table 2. Included deradicalization studies, sample characteristics, methods of assessment and quality rating.

	Study	Year	Design	*N*	Location	Males (%)	Mean age (years)	Extremist organization	Deradicalization context	Outcomes assessed	Quality rating
1.	Campelo et al.	2018	Prospective observational & interventional	150	France	32.7	19.8	Islamic extremism	CPDSI	Motives for radicalization, follow-up deradicalisation status, demographic characteristics	10
2.	Jasko et al.	2019	Observational	379	Indonesia	69.4	31.4	Islamic extremism	Former members of extremist groups	Quest for significance, social context, support for violent extremism	9
3.	Klaussen et al.	2016	Cross-sectional	579	USA	NR	31.6	Hamas, Hezbollah, Al-Qaeda	U.S. citizens/residents convicted of terrorism-related crimes	Demographic characteristics	8
4.	Merari et al.	2010	Cross-sectional	41	Israel	100.0	22.3	Palestinian terrorists	Jailed Palestinian terrorists,	Demographic characteristics, suicidal ideation, depressive symptoms	6
5.	Milla et al.	2019	Observational	89	Indonesia	99.0	34.9	Islamic extremism	Deradicalisation programs in 35 Indonesian prisons	Attitude toward rehabilitation, support for Jihad, adoption of alternative identities	10
6.	Pfundmair et al.	2019	Cross-sectional	75	Germany	89.1	21.8	Islamic extremism	Suspected radical extremists under investigation by German Police	Social exclusion, economic factors, individual processes, radical attitudes & intentions	11
7.	Prislan et al.	2018	Cross-sectional	52	Western Balkans	NR	Nr	Religious, right wing or nationalist radicalization	Stakeholder preventive deradicalisation efforts	Knowledge of radicalization, type of radicalization, perceived effectiveness of radicalization prevention	5
8.	Webber, Klein et al.	2017	Cross-sectional	219	Israel	86.8	23.8	Palestinian terrorism database	NR	Motives for joining, loss and quest for significance, demographic information	8
9.	Webber, Babush et al.	2018	Experimental	344	USA	68.6	38.3	Political extremism	LoS intervention	Loss of significance, need for closure, political extremist beliefs	12
10.	Webber Chernikova et al.	2018	Longitudinal	601	Sri Lanka	46.4	28.9	NR	Sri Lankan rehabilitation program for former LTTE	Extremism attitudes, rehabilitation attitudes, loss of significance, program participation	11

Note. LTTE = Liberation Tigers of Tamil Eelam. Western Balkans = Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia, Serbia, Kosovo, Albania. CPDSI = Center de Prévention contre les Dérives Sectaires liées à l'Islam. ASG = Islamic militants from Abu Sayyaf Group (ASG). U.S. = U.S. domestic violence extremists (right and left wing). FAR = the Fuerzas Armadas Revolucionarias De Colombia. ELN = the Ejercito de Liberacion Nacional. AUC = Autodefensas Unidas de Colombia. Acceptance of democratic civil life = measures participants responses and attitudes toward adopting alternative views on Islam and the supremacy of law in Indonesia. Field and Experimental = two field studies (Philippines & Sri Lanka) were carried out with experimental studies carried out with American samples. MTurk = Americans recruited from Amazon Mechanical Turk service. Palestinian terrorism database = authors analyzed data from Ariel Merari of Tel Aviv University's database of individual suicide attackers dating between 1974-2008. NR: not reported.

these maladaptive cognitions also strongly associated with symptoms of PTSD and depression (see Table 3).

Taken together, this suggests that there may be individual differences in the ability to make meaning of certain PMIEs that determines whether they have a protective or harmful impact with regards to the development of adverse mental health outcomes associated with moral injury.

Loss of Subjective Meaning following PMIEs

PMIE exposure and moral injury was found to be associated with a general loss of subjective meaning in six studies, such as perceived lack of meaning or purpose in life following the event; this loss was also linked with poorer mental health outcomes. For example, Jinkerson et al. [30] found PMIE exposure was significantly associated with lower levels of subjective meaning in life following the event (r=-.31, $p < 0.05$). This impact on loss of meaning may be influenced by event type, with Currier et al. [31] and Kopacz et al. [32] observing a stronger association between struggles with loss of subjective meaning following transgressive acts committed by the self, compared to transgressive acts committed by others (see Table 4).

Low levels of meaning in life following PMIEs was significantly associated with a range of psychological difficulties, including PTSD, depression and anxiety (see Table 4). For example, Williams & Berenbaum [33] observed significant associations between negative alterations in world views post-PMIE and PTSD, depression, suicidality but not alcohol use. Similarly, Ames et al. [34] observed a significant positive association

Table 3 Studies examining the relationship between PMIE exposure, meaning made of the event, and moral injury-related mental health outcomes.

	Author	Year	Meaning making	Association
1.	Currier, Holland & Malott	2015	Difficulties making meaning of PMIEs	PMIE r=-0.40, $p < 0.001$ PTSD r=-0.69, $p<.01$ Depression r= −0.53, $p<.01$ Suicide risk r=-0.35, $p<.01$
2.	Currier, Holland, Rojas-Flores, Herrera & Foy	2015	Difficulty making meaning of PMIEs	PMIE r=-0.22, $p < 0.001$ PTSD Reeexperiencing r=-0.40, $p < 0.001$ PTSD Avoidance r=-0.40, $p < 0.001$ PTSD Hyperarousal r=-0.37, $p < 0.001$
3.	Evans et al.	2018	Posttraumatic growth	MI-S $r = 0.18$, $p < 0.001$ MI-O $r = 0.04$, $p > 0.05$ MI-PB $r = 0.02$, $p > 0.05$
			Life satisfaction	MI-S $r = 0.27$, $p < 0.001$ MI-O $r = 0.17$, $p < 0.05$ MI-PB $r = 0.03$, $p > 0.05$
4.	Ferrajao & Oliveira	2014	Integration of event into personal schemas	PMIE r=-0.14, $p > 0.05$ PTSD r=-0.41, $p < 0.001$ Depression r=-0.53, $p < 0.001$
5.	Held et al.	2017	Negative beliefs about self	PTSD $r = 0.54$, $p < 0.01$ Depression $r = 0.46$, $p < 0.01$
			Negative beliefs about others/world	PTSD $r = 0.53$, $p < 0.01$ Depression $r = 0.34$, $p < 0.01$

Note. MI = moral injury, PMIE = potentially morally injurious event (exact event type not specified), MI-O = morally injurious event perpetrated by other, MI-S = morally injurious event perpetrated by self, MI-PB = morally injurious event involving perceived betrayal. PTSD = post-traumatic stress disorder, p = level of statistical significance.

Table 4 Studies examining the relationship between PMIE exposure and loss of subjective meaning and moral injury-related mental health outcomes.

	Author	Year	Meaning making	Association
1.	Ames et al.	2019	Loss of meaning	Suicide risk $r = 0.35$, $p < 0.0001$
2.	Battles et al.	2019	Spiritual injury[a]	PMIE $r = 0.60$, $p < 0.01$ Alcohol dependence $r = 0.34$, $p < 0.001$
3.	Currier, Foster & Isaak	2019	Struggle with meaning	MI-S $r = 0.56$, $p < 0.001$ MI-O $r = 0.52$, $p < 0.001$
4.	Jinkerson & Battles	2019	Higher meaning in life	PMIE r=-0.31, $p < 0.05$ Depression r=-0.30, $p < 0.05$ Anxiety r=-0.32, $p < 0.001$ PTSD r=-0.43, $p < 0.001$
5.	Kopacz et al.	2018	Spiritual injury[a]	PMIE $r = 0.07$, $p > .05$ MI-S $r = 0.21$, $p < 0.10$ MI-O $r = 0.08$, $p > 0.05$ MI-PB $r = 0.04$, $p > 0.05$
6.	Williams & Berenbaum	2019	Altered world views	PTSD $r = 0.72$, $p < 0.001$ Alcohol use $r = 0.25$, $p > 0.05$ Depression $r = 0.62$, $p < 0.001$ Suicidality $r = 0.62$, $p < 0.001$

Note., MI-O = morally injurious event perpetrated by other, MI-S = morally injurious event perpetrated by self, MI-PB = morally injurious event involving perceived betrayal. Spiritual injury[a] = Spiritual Injury Scale (Berg, 1994) measures negative appraisals including guilt, anger, sadness, lack of meaning or purpose, hopelessness. Altered world views = Stressful Life Experiences Scale (Holland et al., 2010), measures degree to which participants perceptions of themselves, others and the world had changed post-PMIE; items include 'my understanding of how the world works has never been the same since this event).PTSD = posttraumatic stress disorder.

between loss of meaning or purpose following military PMIE exposure and higher risk of suicide ($r = 0.35$, $p < 0.0001$).

Religiosity and Spirituality

Six moral injury studies investigated the role of religiosity and spirituality in moral injury development and moral injury-related distress (see Table 5).

Consistent with the previous section, four studies found that moral injury was associated with spiritual struggles. For example, Lancaster and Miller [35] found that U.S. military veterans' experiences of moral injury was significantly associated with religious strain (e.g. fear of God's punishment, difficulty trusting God), especially for MI-Other events ($r = 0.49$, $p < 0.001$). In this study, religious strain was significantly positively associated with the number of transgressive acts participants reported ($r = 0.29$, $p < 0.01$; data not shown in table). Moreover, this study did not a significant relationship between PMIEs and experiencing religious comfort (MI-Self r=-0.02, $p > 0.05$; MI-Other r=-0.01, $p > 0.05$). Currier et al. [36] observed a similar association between experiencing divine struggles following PMIEs, with a stronger effect observed following MI-Self events ($r = 0.39$, $p < 0.0001$). However, the impact of religious strain or struggle post-PMIE is limited as both of these studies did not examine the relationship between religiosity following PMIEs and mental health outcomes. Ames et al. [37] further clarified this relationship by observing a significant positive association for religious struggles and loss of religious faith or hope and suicidality following PMIEs in U.S. military veterans. Battles et al [38] demonstrated that both higher levels of exposure to PMIEs and experiences of spiritual injury were significantly associated with increased alcohol use after combat exposure (see Table 5). However, this relationship was only significant

Table 5 Studies examining the relationship between PMIE exposure, spirituality or religiosity, and moral injury-related mental health outcomes.

	Author	Year	Religiosity/spirituality	Association
1.	Ames et al.	2019	Loss of religious faith/hope	Suicide risk $r = 0.37$, $p < 0.0001$
			Religious struggles	Suicide risk $r = 0.25$, $p < 0.0001$
2.	Currier, Foster & Isaak	2019	Divine struggles	MI-S $r = 0.39$, $p < 0.0001$
				MI-O $r = 0.35$, $p < 0.0001$
3.	Lancaster & Miller	2019	Religious strain	MI-S $r = 0.44$, $p < 0.01$
				MI-O $r = 0.49$, $p < 0.01$
			Religious comfort	MI-S r=-0.02, $p > 0.05$
				MI-O r=-0.01, $p > 0.05$
4.	Battles et al.	2019	Spiritual injury	PMIE $r = 0.60$, $p < 0.01$
				Alcohol dependence $r = 0.34$, $p < 0.001$
5.	Youssef et al.	2018	Religious involvement	MI symptoms r= −.41, $p < 0.001$
				PTSD r=-0.17, $p = 0.058$
6.	Kopacz et al.	2018	Spiritual injury	PMIE $r = 0.07$, $p > 0.05$
				MI-S $r = 0.21$, $p < 0.10$
				MI-O $r = 0.08$, $p > 0.05$
				MI-PB $r = 0.04$, $p > 0.05$
			Intrinsic religiosity	PMIE r=-0.14, $p > 0.05$
				MI-S r= −0.11, $p < 0.10$
				MI-O r=-0.16, $p > 0.05$
				MI-PB r=-0.08, $p > 0.05$

Note. PMIE = potentially morally injurious event, MI = moral injury, MIEs = morally injurious events, MI-O = morally injurious event perpetrated by other, MI-S = morally injurious event perpetrated by self, MI-PB = morally injurious event involving perceived betrayal, PTSD = post-traumatic stress disorder, p = level of statistical significance.

for male veterans (data not shown in table) and could represent a gender-specific maladaptive coping mechanism to manage the negative emotions caused by spiritual injuries.

Conversely, two studies challenged this assertion of the role of religiosity as a risk factor for moral injury. Youssef et al [39] found treatment-seeking U.S. military veteran report of moral injury-related symptoms were significantly negatively associated with religious involvement (e.g. importance of religion, religious commitment/involvement; r=-.41, $p < 0.001$). Religious commitment was only weakly associated with PTSD symptom severity (r=-0.17, $p = 0.58$). Yet, there was no overall significant effect of religious involvement in the relationship between moral injury and PTSD ($b = 0.001$, SE = 0.001, $p = 0.43$, data not shown in Table 5) and there was a buffering effect of religiosity on moral injury development in veterans who had served in non-middle eastern theaters of war ($b = -0.004$, SE = 0.002, $p = 0.04$, data not shown in Table 5). This suggests a possibly protective effect of religious involvement for veterans depending on deployment location; however, the average length of time since last deployment in this sample was 23.2 years which may have potentially influenced these findings. Moreover, as previously discussed, Kopacz et al [40] only found a significant association between a loss of spirituality and MI-Self events ($r = 0.21$, $p < 0.10$), but this effect was not found following MI-Perceived Betrayal and MI-Other events (see Table 5). This study also found no statistically significant relationships between reported PMIEs and subjective, or intrinsic, religiosity (see Table 5) which reduces reliability of evidence supporting religiosity as a risk factor for moral injury. However, methodological flaws in this study may limit its power to detect significant results, as it only included 84 participants of whom 98% were male [41]. Furthermore, all six of these studies were conducted in U.S. military samples, some of which were treatment-seeking, which may reduce cross-cultural validity of evidence and generalisability to other populations

with differing levels of religiosity. Overall, these studies indicate mixed results for the impact of religiosity and spirituality on susceptibility to developing moral injury and suggest any changes in religious beliefs experienced after certain morally injurious events could potentially be due to the presence of other mediating variables.

PMIE and Psychosocial or Demographic Factors

Thirteen of the 21 moral injury studies identified in this review indicated that several psychosocial factors were significantly associated with morally injurious outcomes (see Table 6).

Experiences of early adverse childhood experiences (ACEs) were examined as a potential risk factor for moral injury development in one study [42]. Overall, no significant association was found between ACEs and exposure to morally injurious events ($r = 0.15$, $p > 0.05$), nor was there a significant association between ACEs and PTSD ($r = 0.10$, $p > 0.05$). When ACEs were examined by event type, only experiences of emotional abuse were significantly associated with PMIE exposure ($r = 0.47$, $p < 0.01$; data not shown in table); nonetheless, emotional abuse and other abuse types (e.g. physical abuse, neglect) were not significantly associated with PTSD symptoms (data not shown in table). While the generalisability of findings may be reduced by the small sample ($n = 33$), this study does indicate certain pre-military risk factors, like abuse, could potentially exacerbate distress and increase negative outcomes after military stressors encountered as adults.

Social connectedness was associated with experiences of moral injury and moral injury-related mental health outcomes. Currier et al. [43] found interpersonal struggles was strongly positively associated with reporting of transgressive events committed by oneself or others. Kelley et al. [44] and Feingold et al. [45] found that higher levels of perceived social support was potentially protective against moral injury-related mental health outcomes, such as suicidality (see Table 6). Similarly, higher levels of thwarted belongingness, or the perception that one lacks positive, reciprocal relationships, was also significantly associated with experiencing perceived betrayal events and more symptoms of anger and suicidality [46]. This may indicate a negative impact of certain PMIEs on perceptions of social support and subsequent psychological outcomes. Although, it should be noted that Ferrajo and Oliveira [47] did not find a significant association between perceived social support and PMIE exposure or PTSD symptoms. Previous research [48] has found that military reserve or active service status to be protective of psychological wellbeing due to higher levels of social support compared to military veterans who have left service. However, two studies did not find a consistently significant association between active or reserve status [49] and fewer PMIEs or moral injury-related mental health symptoms as compared to military veterans (see Table 6). Taken together, our result found the role of social support in moral injury development is not entirely clear and, as all of these studies included military samples, how social support influences moral injury in other contexts remains unknown. Finally,

Table 6 Studies examining the relationship between PMIE exposure, moral injury-related mental health outcomes and psycho-social factors.

	Author	Year	Psychosocial factor	Association
1.	Battaglia et al.	2019	Childhood adversity	PMIE $r = 0.15$, $p > 0.05$ MI-Self $r = 0.22$, $p > 0.05$ MI-PB $r = 0.09$, $p > 0.05$ PTSD $r = 0.10$, $p > 0.05$
2.	Battles et al.	2019	Male gender	PMIE $r = 0.13$, $p < 0.05$
			Military status	PMIE r=-0.06, $p > 0.05$
			Military branch	PMIE $r = 0.17$, $p < 0.01$
			Years of service	PMIE r=-0.10 $p > 0.05$
3.	Currier, Foster & Isaak	2019	Interpersonal struggles	MI-S $r = 0.46$, $p < 0.0001$ MI-O $r = 0.48$, $p < 0.0001$
4.	Ferrajao & Oliveira	2014	Perceived social support	PMIE r=-0.03, $p > 0.05$ PTSD r=-0.06, $p > 0.05$ Depression r=-0.25, $p < 0.05$
5.	Forkus et al.	2019	Self-compassion	PMIE r=-0.22, $p < 0.001$ PTSD r=-0.29, $p < 0.001$ Depression r=-0.41, $p < 0.001$ Alcohol misuse r-0.27, $p < 0.001$ Drug misuse r=-0.21, $p < 0.05$ Self-harm r=-0.25, $p < 0.001$
6.	Feingold et al.	2019	Perceived social support	MI-O r=-0.12, $p > 0.05$ MI-S r=-0.14, $p < 0.05$ MI-PB r=-0.18, $p > 0.05$ PTSD r=-0.24, $p < 0.01$ Depression r=-0.24, $p < 0.001$
7.	Hellenthal et al.	2017	Traditional personal values	MI-S $r = 0.14$, $p > 0.05$ MI-PB $r = 0.01$, $p > 0.05$
8.	Kelley et al.	2019	Self-kindness	MI-S r=-0.40, $p < 0.05$ MI-O r=-0.36, $p < 0.05$ Suicidality −0.22, $p < 0.05$
			Mindfulness	MI-S r=-0.45, $p < 0.05$ MI-O r=-0.34, $p < 0.05$ Suicidality r=-0.18, $p < 0.05$
			Social connectedness	MI-S r=-0.47, $p < 0.05$ MI-O r=-0.52, $p < 0.05$ Suicidality r=-0.44, $p < 0.05$
			Years in military	MI-S r=-0.10, $p > 0.05$ MI-O $r = 0.00$, $p > 0.05$ Suicidality r=-0.05, $p > 0.05$
			Length of deployment	MI-S $r = 0.05$, $p > 0.05$ MI-O $r = 0.08$, $p > 0.05$ Suicidality $r = 0.08$, $p > 0.05$
9.	Lancaster & Miller	2019	Altruism	MI-S $r = 0.16$, $p > 0.05$ MI-O $r = 0.25$, $p < 0.05$
10.	Levi-Belz et al.	2020	Self-forgiveness	MI-S r=-0.13, $p > 0.05$ MI-O r=-0.09, $p > 0.05$ MI-PB $r = 0.01$, $p > 0.05$ PTSD r=-0.34, $p < 0.001$ Depression r=-0.48, $p < 0.001$ Suicidality r=-0.31, $p < 0.001$
11.	Martin et al.	2017	Thwarted belongingness	MI-PB r=-0.31, $p < 0.01$ Physical aggression $r = 0.21$, $p < 0.01$ Verbal aggression $r = 0.26$, $p < 0.01$ Hostility $r = 0.52$, $p < 0.01$ Anger $r = 0.35$, $p < 0.01$ Perceived burdensomeness $r = 0.69$, $p < 0.01$
12.	Youssef et al.	2018	Middle East deployment	MI symptoms $r = 0.52$, $p < 0.05$

(*Contiuned*)

Table 6 Contiuned.

	Author	Year	Psychosocial factor	Association
13.	Zerach & Levi-Belz	2019	Reserve duty	MI-S $r = 0.06$, $p > 0.05$ MI-PB $r = 0.14$, $p > 0.05$ Depression $r = 0.14$, $p > 0.05$ PTSD $r = 0.11$, $p > 0.05$ SITB r=-0.13, $p < 0.05$
			Intolerance of uncertainty-prospective	MI-S r=-.10 $p > 0.05$ MI-PB r=-0.01, $p > 0.05$ Depression $r = 0.42$, $p < 0.001$ PTSD $r = 0.14$, $p > 0.05$ SITB r=-0.04, $p > 0.05$
			Intolerance of uncertainty-inhibitory	MI-S $r = 0.11$, $p > 0.05$ MI-PB $r = 0.02$, $p > 0.05$ Depression $r = 0.50$, $p < 0.001$ PTSD $r = 0.26$, $p < 0.001$ SITB $r = 0.09$, $p > 0.05$

Note. PMIE = moral injury, MI-O = morally injurious event perpetrated by other, MI-S = morally injurious event perpetrated by self, MI-PB = morally injurious event involving perceived betrayal, SITB = self-injurious thoughts and behaviors, PTSD = post-traumatic stress disorder, p = level of statistical significance. Military status: dummy coded as 0= veteran, 1 = all others (e.g. active study, National Guard/reserves. Military branch: dummy coded as 0 = Navy, 1= all others (e.g. Army, Air Force, Marines, Coast Guard, National Guard/reserves). Years of service: dummy coded as 0= <10 years, 1 = all others. Traditional personal values = includes measurement of restraint of actions likely to harm others, appreciation of and commitment to cultural customs, and preserving and enhancing the welfare of those to whom one is close to. Length of deployment = number of deployment months. Thwarted belonginess = perception that one lacks positive, reciprocal relationships. Perceived burdensomeness = belief that one is a burden to others and one's death is worth more than one's life. Intolerance of uncertainty – prospective = measures reactions to uncertainty and the unknown future (e.g. unforeseen events upset me greatly). Intolerance of uncertainty – inhibitory = measures reactions to uncertainty and ambiguous situations (e.g. uncertainty keeps me from living a full life).

other military related factors, such as branch, years of service, and length of deployment were also not found to be significantly associated with risk of PMIEs or moral injury-related symptoms, although moral injury symptoms were significantly more severe in veterans who deployed to the Middle East compared to other combat theaters in one study [50] (see Table 6).

Six studies examined personality traits and individual beliefs as factors the development of moral injury and related mental health difficulties. Forkus et al. [51] found a potentially protective role of high self-compassion traits against moral injury and adverse mental health outcomes following PMIEs, including PTSD, substance misuse and self-harm. Kelley et al. [52] found similar protective effects of self-kindness and mindfulness following transgressive acts, transgressions of others, with higher self-kindness and mindfulness significantly associated with less suicidality. Similarly, dispositional self-forgiveness was assessed by Levi-Belz et al. [53], with self-forgiveness not associated with PMIE exposure, although higher levels of self-forgiveness were strongly negatively associated with fewer symptoms of PTSD, depression and suicidality. The role of intolerance of uncertainty in moral injury development was examined by Zerach & Levi-Belz [54], although few firm conclusions can be drawn as intolerance was not associated with reported PMIE exposure, nor was it consistently associated with moral injury-related mental health outcomes (see Table 6). Two studies examined altruism [55] or traditional values, the measurement of which encompassed self-reported restraint of actions likely to harm others and preserving the welfare of loved ones [56]. Across both of these studies, few significant associations were found between higher levels of altruism/traditional values and PMIE exposure; in fact, altruism was not

Table 7. Studies examining radicalization and the role of loss of significance.

	Author	Year	Motivation	Association
1.	Jasko et al. [a]	2019	Collective quest for significance	Ideological extremism $r = 0.45$, $p < 0.001$ Violent extremism $r = 0.70$, $p < 0.001$
			Quest for individual significance	Ideological extremism r=-0.06, $p > 0.05$ Violent extremism r=-0.28, $p < 0.01$
2.	Milla et al.	2019	Adoption of alternative identities	Support for Jihad $r = 0.43$, $p < 0.01$
3.	Pfudamir et al.	2019	Need for significance	Radical extremism $r = 0.19$, $p > 0.10$
			Trauma history	Radical extremism $r = 0.19$, $p > 0.10$
4.	Webber, Babush et al.	2018	Loss of significance intervention	More extreme political beliefs $r = 0.22$, $p > 0.05$
5.	Webber, Klein et al.	2017	Quest for significance	Casualties $r = 0.47$, $p < 0.001$
6.	Webber, Chernikova et al.	2018	Alternative routes to significance intervention	Endorsement of extremism r=-0.95, $p < 0.05$

Note. Collective quest for significance = the extent to which one believes that one's group is not being respected in the manner deserved which induces a motivation (the quest for significance) to remedy these feelings (e.g. "I will never be satisfied until our group gets the recognition they deserve"). a = data reported for the Jihadist sample. Casualties = the number of casualties per assault and interpreted by authors as an indicator of more effective attackers. p = level of statistical significance.

significantly associated with the number of transgressive acts reported (r=-0.02, $p > 0.05$; data not shown in table) [57]. Although, small significant association between altruism and reported transgressions by others was found [58]. As neither of these studies examined the relationship between altruistic values and moral injury-related mental health outcomes, and as Hellenthal's [59] participants were currently deployed active service personnel which could have influenced their reporting of altruistic values, our understanding of the role of these individual traits in moral injury development remains limited.

Radicalization Risk and Protective Factors

Personal Significance Loss or Gain as a Risk Factor for Radicalisation

Of the ten studies which examined radicalization, seven directly considered the role of perceived personal significance loss or gain as a motive (see Table 7).

Significance loss is defined as experiences of humiliation, shame or dishonor that reduces one's personal or social group's significance below normal levels and motivates behaviors to restore it. Several studies examined whether increased feelings of insignificance were associated with greater radical extremism, with mixed results [60]. One study found that the need to gain (or restore) personal significance was a central motivation for engaging in violent extremism. Of the 219 cases of suicide attackers assessed by Webber et al. [61], in 149 (68%) cases evidence of a significance loss (e.g. 'attacker had a personal failure') and/or gain motive for the attack (e.g. 'attacker wanted a sense of purpose or meaning in life') was found. Moreover, authors found that attackers who were more driven by yearning for significance were significantly more

effective attackers as measured by the number of casualties per assault ($r = 0.47$, $p < 0.001$). Similarly, Jasko et al. [62] found that, compared to more moderate participants, Jihadist participants were significantly more likely to express a higher quest for collective significance (e.g. "I will never be satisfied until our group get the recognition they deserve") and supported violence to a larger extent (see Table 7). Two further studies also found that deradicalization programs that focused on providing alternative routes to significance were more effective in reducing detainee's support for radical extremism [63].

However, this association was not unanimous. When compared to non-radical detainees, Pfudamir et al. (41) found that radical Islamic detainees did not report significantly higher levels of need for significance ($p > 0.05$). Moreover, in an experimental design, Webber, Babush et al. [64] found that manipulating participants perceptions of loss of significance did not significantly increase their political extremist views directly ($r = 0.22$ $p > 0.05$). Although, the reliability of the authors' loss of significance intervention is unclear as participants were primed with an online cued-recall task to think of and describe a situation where they (or someone else) had been humiliated. As participants responses to this intervention task were not described, how this compares to the loss of significance experiences reported by radicalized extremists found by other studies is unknown.

Two further studies proposed that the experience of traumatic events can increase one's receptiveness to radical ideologies and significance motives; for example, a traumatic loss may produce feelings of a need to revenge or radical groups may offer a sense of belonging. Campelo et al. [65] found that 27.0% of radicalized participants reported experiencing physical and/or sexual abuse, with 85.0% reporting neglect or psychological abuse (data not shown in table). The usefulness of this finding is limited as this study did not examine whether these trauma exposure variables were associated with radicalization status following deradicalisation efforts. Finally, compared to non-radical detainees, Pfudamir et al. [66] found that radical Islamic detainees were not significantly more likely to report a history of trauma exposure ($p > 0.05$). Taken together, the evidence of the role of significance motives, including pre-radicalization trauma exposure, in the radicalization process is limited and remains unclear.

Sociodemographic Characteristics as Risk Factors for Radicalisation

Six of the included ten studies of radicalization identified sociodemographic factors associated with different trajectories of radicalization (see Table 8).

In terms of demographic characteristics, five studies investigating primarily Islamic extremists found that factors such as male gender, being Muslim by birth and a personal or family history of criminality were significantly associated with vulnerability to radicalization. For example, Pfundmair et al. [67] found radicalized individuals were significantly more likely to have a criminal record compared to non-radicals. Inconsistent findings were found regarding age, with Klausen et al. [68] reporting that foreign fighters were significantly more likely to be younger; while Milla et al. [69] found that age was

Table 8 Studies examining radicalization and the role sociodemographic risk and protective factors.

	Author	Year	Sociodemographic factor	Association
1.	Campelo et al.		Male gender	Deradicalisation status $r = 0.21$, $p < 0.05$
			Being married	Deradicalisation status, $r = 0.15$, $p < 0.05$
			Muslim by birth	Deradicalisation status $r = 0.32$, $p < 0.05$
			Imprisonment of friend/ relative	Deradicalisation status $r = 0.16$, $p < 0.05$
			Psychiatric consultation before radicalization	Deradicalisation status r=-0.16, $p < 0.05$
			Suicidality before radicalization	Deradicalisation status r=-0.19, $p < 0.05$
2.	Klausen et al.	2016	Age	Foreign fighter r=-0.49, $p < 0.05$
3.	Milla et al.	2019	Age	Support for Jihad $r = 0.08$, $p > 0.05$
4.	Merari et al.	2010	Suicidal ideation	Suicide bombers $r = 0.48$, $p < 0.05$
			Depression	Suicide bombers $r = 0.47$, $p < 0.05$
5.	Prislan et al.	2018	Radicalism	Religious $r = 0.43$, $p < 0.05$
6.	Pfundmair et al.[a]	2019	Male gender	Radicalized $r = 0.27$, $p < 0.05$
			Mental problems	Radicalized r=-0.34, $p < 0.05$
			Criminal record	Radicalized $r = 0.27$, $p < 0.05$
			Social exclusion	Radicalized $r = 0.21$, $p < 0.05$

Note. p = level of statistical significance, a = this study compared radicalized to non-radicalized participants. b = this study compared ideologically and economically motivated radicals. Suicide bombers = likelihood of having mental health problems found to be greater in the suicide bomber group as compared to controls who were matched for age, marital status, and education. Foreign fighter = whether an individual was charged with participating in foreign insurgencies compared with providing nonviolent material support for terror (e.g. fundraising). Radicalism = religious extremism frequency as compared to left extremism, right extremism, environmental extremism, and extremism linked to nationality..

positively associated with degree of endorsement of jihad (although this finding was not statistically significant). Nonetheless, it should be noted that most studies in this review included primarily male, Muslim, relatively young participants and the findings must be understood in the context of their samples rather than generalized to any young, male, Muslim individuals.

Two studies examined interpersonal difficulties as a risk factor for radicalization. Campelo et al. [70] found having friends or family who have been imprisoned before radicalization was associated with worse outcomes after a deradicalisation program. This study also found that being married was significantly associated with poorer outcomes and hypothesize that this may be because partners support and encourage each other's commitment to radicalization. Pfundmair et al. [71] found radicalized individuals were more likely to report experiencing higher levels of social exclusion compared to non-radicals ($r = 0.21$, $p < 0.05$).

Three studies examined the role of mental health difficulties in vulnerability to radicalization. Campelo et al. [72] suggest experiencing psychological difficulties before radicalization, such as history of suicidal behavior, may have protective effects (see Table 8). This was attributed to the protective impact of the psychological care received to support individuals with these vulnerabilities and has implications for the inclusion of mental health care in a multidimensional prevention approach to deradicalisation. However, Merari et al. [73] found that failed suicide bombers were significantly more likely to report suicidal ideation and depressive symptoms compared to matched, non-terrorist controls. However, extreme caution is required when interpreting this study's findings given the unreliable, outdated tools used – such as the Rorschach and Thematic Apperception Tests [74].

These studies highlight the importance of understanding the conditions under which radicalization is more likely to develop to increase identification of at-risk groups and efficacy of subsequent preventive strategies.

Discussion

This review aimed to examine the literature on moral injury and radicalization to explore whether individual differences may impact an individual's susceptibility and resilience to these experiences. Given that some of the underlying risk factors for radicalization appear similar to those of moral injury, we explored the individual-level factors involved in the radicalization process, the impact of moral injury on an individual's beliefs and behaviors that are relevant to radicalization and whether moral injury is a useful way to understand radicalization.

The review identified that difficulties making meaning or sense of the event were significantly associated with poorer moral injury-related mental health outcomes, including likely PTSD, alcohol misuse, depression and suicidality. Finding individual difference in responses after PMIEs is consistent with previous theoretical conceptualisations of moral injury [75], which postulate that PMIEs cause moral dissonance contributing toward negative cognitions about the self and others [76]. Moreover, the review also identified a significant link between PMIEs and loss of subjective meaning, associated with negative emotions such as shame, anger, guilt, and a perceived lack of purpose in life. These difficulties were, in turn, also significantly associated with adverse mental health outcomes. This finding is in synergy with previous qualitative studies which have found that guilt and shame following morally injurious events can lead to maladaptive coping behaviors – such as alcohol consumption and risk taking - which considerably disrupts daily functioning [77]. However, we also found that more adaptive meaning making following PMIEs, such as experiencing PTG post-event, was associated with greater life satisfaction. Taken together this suggests that individual differences in the ability to adaptively make sense of PMIEs could, in part, determine whether the event(s) have a protective or deleterious impact on moral injury-related mental disorders. We suggest that these findings have implications for counter-extremism efforts as well as clinical treatment, indicating the potential utility of cognitive restructuring and that targeting moral emotions may be especially helpful in improving individual wellbeing in cases of moral injury [78].

Consistent with more theological conceptualisations of moral injury, this review also found a relationship between spiritual injury, or a loss of spiritual beliefs, following PMIEs and experiencing moral injury-related mental health problems. Some studies found that experiences of PMIEs were associated with religious struggles or loss of religious faith as well as with likely PTSD, suicidality and alcohol misuse. However, this effect was not unanimous, with a small number studies finding a buffering effect of religiosity against the development of moral injury. It is possible that this inconsistency reflects methodological issues with measurement, with measures of spiritual injury also simultaneously assessing other factors such as moral emotions of guilt and shame. Potentially, it may be that religiosity or spirituality is protective following PMIEs up to a point, but once it ceases to be, those who experience moral injury may begin

to question their spiritual beliefs. This finding highlights the ongoing need for a validated, comprehensive measure of the impact of PMIE exposure on wellbeing. Moreover, as all studies examining individual differences in spiritual injury were carried out in U.S. military personnel/veterans, it remains unclear how such alterations in beliefs after moral injury are experienced in other populations.

A number of psychosocial and demographic characteristics were also identified as possible risk factors for moral injury development, including experiences of earlier childhood adversity, male gender, and being deployed to the Middle East [79]. Mixed evidence was found for the role of other factors in the development of moral injury; some studies reported protective effects, while others reported adverse outcomes for factors such as intolerance of uncertainty [80], altruism [81], and perceived social support [82]. Whilst more research is needed, our review suggests a role for individual differences in impacting susceptibility and resilience to moral injury. Too few studies examined such individual factors however for firm conclusions to be drawn. More studies are needed to replicate these findings in other (more diverse) populations, such as in nonmilitary samples, which are underrepresented in existing literature.

This review also identified several risk and protective factors involved in radicalization process. Striving to restore personal or collective significance was found to be a motivator for radical extremism in some cases [83]. We also found some evidence that experiencing a traumatic event was associated with later risk of radicalization, potentially due to significance seeking motives. This could tentatively indicate that experiencing a traumatic event that resulted in feelings of loss of personal significance could make one vulnerable to extremist views, belief change and possible radicalization. This finding shares a potential conceptual overlap with moral injury. That both individuals who develop radical beliefs and individuals with moral injury may be exposed to events which provoke similar emotions (i.e. anger, guilt and shame) and produce negative appraisals, including a loss of significance and questioning of identity, suggests that moral injury may be a useful way to understand the process of radicalization. This could have prevention implications against radical extremism. For example, providing alternative nonviolent routes to significance could be especially beneficial, for example interventions which encourage meaningful social relationships with non-radicals [84] or foster skills to increase one's sense of personal success and significance in non-radical domains [85]. In some cases, the principles of treating moral injury related mental ill-health may also have relevance in preventing radicalization. Moreover, future intervention efforts could also consider screening for trauma exposure amongst those at risk of radical extremism and offer targeted support to more adaptively respond post-trauma. Furthermore, an understanding of moral injury may also be useful in deradicalisation efforts. Individuals belonging to radicalized groups who experience moral injury in relation to their radicalized behavior (e.g. they come to believe that their perpetration of violent extremist acts is wrong) may be especially likely to engage with a de-radicalization program as their bonds with an organization may be weakened [86].

Evidence for other potential risk factors including male gender, having a criminal record, being born a Muslim [if seeking to join Islamic State], younger age, and higher levels of social exclusion were found for radicalization [87]. We noted

some parallels to the moral injury literature – for example, this review found some evidence that interpersonal problems were also a risk factor for moral injury-related distress. Moreover, experiences of childhood adversity was found to be a risk factor for moral injury in one study [88], with deaths of relatives and exposure to abuse also associated with radicalization [89]. Given that radical ideologies, as well as one's moral and ethical code, are informed by societal and cultural norms [90], these social level factors in both the fields of moral injury and radicalization warrant further investigation. Protective factors against radicalization, such as finding alternative routes to significance, were associated with less support for radical ideology [91]. This is consistent with previous reviews [92]. Previous studies have found that those who perpetrate or witness violence, either as a consequence of one's occupation (e.g. soldier) or role in an extremist organization, may face difficulties reintegrating into society [93], distrust and fear of these individuals may be common in communities even years after violent conflict ends. Emerging evidence indicates that traditional cleansing ceremonies have helped to repair relationships between former radicals and their families/communities [94], and there is also some evidence from U.S. studies suggesting that veteran confession to and acceptance by their faith-based congregation may be integral to recovery following PMIEs [95]. Whether such interventions successfully support alternative quests for personal significance, promote de-radicalization and result in better mental health outcomes warrants further investigation.

Strengths and Limitations

This review has several strengths and limitations. A strength of this study was that the methodological quality of all studies was assessed for risk of bias, and it should be noted that the methodological quality of many of the radicalization studies was often poor. A further strength was the exclusion of studies which did not utilize a validated measure to assess moral injury. Nonetheless, the moral injury and radicalization literature has several weaknesses. First, many of the studies identified in this review utilized cross-sectional designs and establishing causality between variables is therefore not possible. The lack of longitudinal studies in both the fields of moral injury and radicalization is a notable gap in the literature which hampers our understanding of the development of moral injury and radicalization over time, the factors that may increase vulnerability, and how such factors could be effectively targeted in future prevention and intervention programs. Second, studies also frequently collected retrospective self-report data, which may be subject to bias. Social desirability bias may particularly impact moral injury participants who may be unwilling to disclose morally injurious events due to fears of judgment by others, with this bias also possibly influencing radical detainee samples who may have incentive to exaggerate disengagement. Third, the inclusion of a number of detainee samples in this review may not be representative of all radicalized individuals most of whom have not been detained. Non-detained radicals may have different motivations for engagement in violent acts. Future studies could consider utilizing an anonymous online survey to

facilitate engagement of non-detained radicalized individuals to capture this perspective. Finally, most of the included studies had relatively small, demographically homogenous samples which reduces their ability to detect significant effects. The generalisability of our results to other populations, such as females, non-U.S., nonmilitary moral injury samples or radicals from a range of countries and extremist organizations (e.g. right-wing extremist groups) is limited.

Conclusions

This review examined whether individual characteristics may influence experiences of moral injury and the impact of moral injury can have on an individual's behaviors and beliefs. We also investigated whether there was a potential role for moral injury in radicalization process and resistance to belief change. This study found that morally injurious events were significantly associated with not only poor mental health outcomes but also loss of subjective meaning and pervasive negative cognitions. Our review indicates that individuals who develop radical beliefs and those with moral injury may both be exposed to events which provoke similar states of distress and adverse outcomes, including a loss of significance, suggesting that moral injury could be a useful way to understand the process of radicalization. This finding thus highlights that processes which may help recovery from moral injury may also potentially prevent people becoming radicalized in the first place. While additional research is required, understanding the processes involved in moral injury has the potential to inform programs trying to prevent individuals initiating the radicalization process, as well as reducing commitment to radical ideologies and promoting disengagement from radical action in those who have already been radicalized.

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