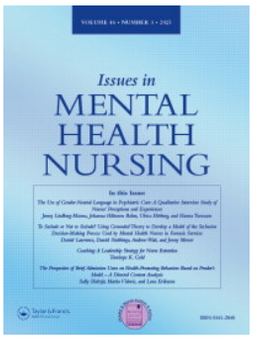

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Proposing the Integrated Pathway Model of Moral Injury (IPM-MI): A Moderated Mediation Analysis of Moral Injury Among Secure Mental Healthcare Staff

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ABSTRACT

Moral injury is a prevalent issue for secure mental healthcare staff, though understanding of the underlying mechanisms is limited. This multi-study paper explores several developmental, cognitive and emotional pathways to moral injury and associated wellbeing outcomes. Frontline and support staff from secure mental healthcare services were recruited to two cross-sectional studies ($n = 527$ and $n = 325$, respectively), and completed several questionnaires. In the first study, findings indicated a serial mediating effect of childhood trauma symptoms, early maladaptive schemas, and maladaptive metacognitions in the pathway between exposure to potentially morally injurious events and moral injury symptoms. Moderating effects of social and organisational support were also apparent. Findings from study two supported pathways between moral injury and psychological, somatic and functional outcomes, which were mediated by negative emotional schema, with limited mediating effects for expressive suppression. Moderating effects of alexithymia on several mediating pathways were also noted. The results support a developmental-cognitive model to account for the development of moral injury and associated adverse well-being outcomes in secure mental healthcare staff. Drawing on the findings and wider literature, the Integrated Pathway Model of Moral Injury (IPM-MI) is proposed and discussed, offering a novel theoretical account that may inform several potential prevention and intervention strategies.

Introduction

Secure mental healthcare settings reflect a unique and challenging environment that pose several ethical and moral tensions. Staff care for people detained against their will, who have typically committed offences involving harm to another, in a particularly restrictive environment that deprives patients of their liberties, including restrictions on 'autonomy of movement' and contact with loved ones (Tomlin et al., 2020). This occupational group balances providing care to their patients with a duty to public protection. Accounting for workforce shortages, insufficient resources and challenging caseloads (British Medical Association, 2019), staff may feel unable to uphold the principles of their profession, laying the foundations for 'moral injury'.

Moral injury can be conceptualised as a non-pathological response to situations in which an individual has 'perpetrated, witnessed, failed to prevent or learnt about acts that transgress deeply held moral beliefs' (Litz et al., 2009, p. 700). Such injury is characterised by guilt and shame (Litz et al., 2009, 2022), a loss of trust in self and/or others, and existential conflict (Jinkerson, 2016). Moral injury is also associated with several psychopathological outcomes, including depression, anxiety and PTSD (Benatov et al., 2022; Saba et al., 2022; Williamson et al., 2018), as well as sleep disorders, social withdrawal, and suicidal ideation (Boscarino et al., 2022; Hall et al., 2022; Padmanathan et al., 2023). Such outcomes are likely to be costly, with impacts on continuity and quality of care (Johnson et al., 2018). Thus, strategies that mitigate risk for moral injury are warranted.

Whilst consideration of moral injury within modern discourse has primarily been within the context of war (see Hall et al., 2022), recent developments in research and practice has seen the application of this framework to wider populations. This expansion is inclusive of the secure mental healthcare workforce, comprised of multi-disciplinary professions including mental and physical health nurses, healthcare assistants, psychologists, psychiatrists, occupational therapists and social workers, as well as non-clinical support staff, to name a few. Recent investigation has indicated a plethora of potential sources of moral injury faced by secure mental

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healthcare staff (Webb et al., 2024, 2025), several of which are arguably inherent features of this setting, including the detention of patients against their will and use of restrictive practices. It is therefore perhaps unsurprising that exposure to a potentially morally injurious event (PMIE) appears almost universal amongst this occupational group (Webb et al., 2024c), with 72.7% of surveyed staff reporting to have experienced a moral transgression. Additionally, scores on the Moral Injury Events Scale (Nash et al., 2013) in secure mental healthcare staff (Morris et al., 2022a) have been found to be elevated, if not comparable, to those reported in military (e.g. Forkus et al., 2019) and general healthcare samples (e.g. Amsalem et al., 2021).

Given that moral challenges may not always be avoidable in secure mental healthcare settings (Webb et al., 2025), and that moral injury may already pervade the workforce (Morris et al., 2022a), the need to understand the mechanisms that underlie the post-PMIE development of moral injury and proliferating effects on wider domains of well-being and functioning is indicated. Drawing on literature from the wider trauma field, several theoretical pathways can be hypothesised.

The way in which an individual makes sense of the world around them (cognitive schemas) may reflect one key mechanism in the development of moral injury. Negative biases in appraisals of events and the subsequent risk for psychopathological outcomes are thought to be underpinned by dysfunctional 'schemas' (Beck, 1976)—cognitive frameworks applied in the interpretation of information about the self, world and others (Piaget, 1926). Such mental blueprints are shaped by early life experiences (Pilkington et al., 2021), with childhood adversity driving the development of 'early maladaptive schemas' (EMSs; Young et al., 2003). EMSs have been found to predict several occupational outcomes, including burnout, depersonalisation, and absenteeism (Bamber & McMahon, 2008; Kaeding et al., 2017), and are positioned as a mediator in the relationship between early trauma and later psychopathology (e.g. Meneguzzo et al., 2021).

The role of EMSs in driving moral injury has not yet been empirically examined, though may be a particularly pertinent mechanism to consider in secure mental healthcare staff. The *Schema-Focused Model of Occupational Stress and Work Dysfunction* (Bamber, 2006) proposes that EMSs predispose individuals towards occupations that mirror the maladaptive environments they experienced during early life. In line with this theoretical position, early exposure to trauma and the subsequent development of maladaptive schemas may be notably prevalent in secure mental healthcare staff, who operate within a work environment characterised by high levels of aggression and vigilance to potential harm (Newman et al., 2024).

Furthermore, how an individual makes sense of their appraisals is a further mechanism of interest. Meta-cognition refers to the monitoring and appraisal of one's own thoughts, and the ability to reflect on internal thought processes to inform sense of self (Lysaker et al., 2018). Maladaptive meta-cognitive beliefs are proposed to drive a series of psychological processes defined as a *Cognitive Attentional Syndrome* (CAS), which includes rumination, threat monitoring and maladaptive coping (e.g. avoidance). Prolonged activation of the CAS is argued to maintain distress, and compounds difficulties in modifying appraisals (Wells & Matthews, 1994, 1996). Individuals exposed to childhood adversity often show greater maladaptive metacognitive beliefs in adulthood (Mansueto et al., 2019), which drive the development of trauma symptoms and wider psychopathological disorders (Sen Demirdogen et al., 2022). Behaviours characteristic of the CAS, such as threat monitoring and persistent worry, are suggested to serve the purpose of avoiding danger and coping with threat in an environment where this is prominent (Myers & Wells, 2015). Accordingly, a maladaptive metacognitive style may serve staff in secure mental healthcare services, where exposure to aggression is a pertinent risk.

In parallel to metacognitive theory, metaemotion theories have been proposed to describe the cognitive appraisal of *emotions*. As theorised within the *Emotional Schema Model* (Leahy, 2002), the way in which an individual makes sense of and then regulates moral emotions may reflect key stages in the pathways *from* moral injury to wider adverse well-being outcomes. Previous research supports beliefs about emotions—'emotional schemas'—as a key driver of psychopathology (Leahy et al., 2019), via the subsequent use of maladaptive emotion regulation strategies (Leahy, 2002). This has not, however, yet been considered in relation to staff working in secure mental health.

Expressive suppression, which is characterised by the internal containing of emotions resulting in an outward behaviour that does not correspond with an individual's internal affective experience, has also been implicated as a mediator of the relationship between occupational stressors and psychological distress in healthcare workers (Kshtriya et al., 2022; Too & Butterworth, 2018), and linked to poor sleep (Vandekerckhove & Wang, 2018) and physical health concerns (Low et al., 2021). Use of this emotion regulation strategy is arguably necessitated when working in secure mental healthcare, where staff are required to maintain a restricted emotional response to distressing events, such as during the restraint of a service user. Accordingly, expressive suppression may be both prevalent and relevant in accounting for the high levels of moral injury and wider adverse well-being outcomes noted in the secure mental healthcare workforce.

An individual's ability to appraise and regulate their emotions is also thought to be grounded in their capacity for emotion recognition, in the first instance (Preece et al., 2017). Alexithymia, defined as the inability to identify and describe one's own feelings, is closely interwoven with emotional schemas and regulation strategies, with research noting significant positive associations between these constructs (Hormozi et al., 2022; Swart et al., 2009). More specifically, evidence indicates a moderating role for alexithymia. Specifically, the effects of beliefs about emotions and subsequent emotion regulation strategies as drivers of psychopathology are influenced by a persons' initial capacity to recognise emotions (Krvavac & Jansson, 2021). Accordingly, the role of emotional schemas and subsequent regulation strategies in the path between moral injury and wider adverse well-being outcomes may be

dependent, to some extent, on a person's level of alexithymia. However, this remains untested.

The current paper reports on two studies that seek to examine the role of the proposed mechanisms of interest, namely childhood trauma symptoms, cognitive and emotional schemas, metacognitions, and emotion regulation strategies, within the context of moral injury. The first study explores potential mechanisms accounting for the development of moral injury following exposure to a PMIE, whilst the second study considers mechanisms driving the links between moral injury and wider well-being adversities. It is predicted that the pathway between PMIE exposure and moral injury will be mediated by childhood trauma symptoms, early maladaptive schemas and maladaptive meta-cognitions, within a sequential path (Mansueto et al., 2019; Pilkington et al., 2021). Furthermore, it is predicted that the pathway between moral injury and wider well-being outcomes will be sequentially mediated by maladaptive emotional schemas and expressive suppression (Kshtriya et al., 2022; Leahy, 2002; Leahy et al., 2019), and that the effects of these mediators will be moderated by alexithymia (Krvavac & Jansson, 2021).

Study one: Pathways to moral injury

Drawing on developmental and cognitive models of psychopathology, this study explores a role for childhood trauma symptoms, cognitive schemas and metacognitions in the pathway between PMIE exposure and moral injury. Based on the results of an earlier Delphi study (Webb et al., 2025), the potential buffering effects of personal social support, organisational support, and emotional labour were also examined.

Method

Participants

A voluntary sample of secure mental healthcare staff with at least 6 months experience were recruited between July and December 2022. Overall, 559 eligible staff submitted a response to the survey. Following examination of Mahanalobis' distance values to identify multivariate outliers, fourteen participants (2.5%) were excluded. Of the remaining 545 participants, 527 (96.7%) had complete data on predictor and mediator variables included in tested models, and were included in the final sample. Participants were aged 19–74 years (Median = 36.0, IQR 27–48), and were mostly female (70.3%), and working in a clinical role (78.9%), primarily nursing (41.6%), as well as psychology (26.5%), social work (3.0%), occupational therapy (2.8%), medicine and psychiatry (both 0.9%), and dietetics (0.8%). Non-clinical occupations represented included administration and human resources (both 5.3%), education (1.5%), finance, IT and maintenance (all 0.9%).

Measures

PMIE exposure and moral injury. The Moral Injury Exposure and Symptom Scale—Civilian (MIESS-C; Fani et al., 2021) is a 10-item self-report measure assessing 'exposure' to self-transgressions, betrayal and transgressions by others (5 items), and the resulting moral injury 'distress' (5 items) experienced. Items are scored from 1 ('strongly disagree') to 6 ('strongly agree').

Mediator variables. Childhood trauma symptoms were assessed using the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5; Prins et al., 2016). This 6-item measure assesses exposure to a traumatic event and corresponding PTSD symptoms experienced in the past month, in line with DSM-5 (American Psychiatric Association, 2013) criteria. A value of '1' is assigned to endorsed symptoms. Participants who had experienced a trauma were asked to specify whether it occurred in childhood (first 18 years of life), adulthood, or both.

The Brief Core Schema Scale (BCSS; Fowler et al., 2006) was used to assess negative self (6 items) and other (6 items) schemas. Respondents are required to indicate whether they hold each belief ('yes' or 'no') and, for any endorsed beliefs, to indicate the degree of belief conviction from 1 ('believe it slightly') to 4 ('believe it totally').

Maladaptive metacognitions were assessed using the Metacognitions Questionnaire-30 (MCQ-30; Wells & Cartwright-Hatton, 2004). Thirty items are rated for agreement from 1 ('do not agree') to 4 ('agree very much').

Moderator variables. The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1990) was used to assess perceived support from family, friends and a significant other. Twelve items are rated for agreement from 1 ('very strongly disagree') to 7 ('very strongly agree').

Organisational support, defined as the extent to which an employee believes their organisation is concerned about their well-being and values their contributions, was assessed using the Survey of Perceived Organisational Support (SPOS; Eisenberger et al., 1986). Eight items are rated for agreement from 0 ('strongly disagree') to 6 ('strongly agree').

Three items from the Emotional Labour Scale (ELS; Brotheridge & Lee, 2003) were used to assess 'surface acting' (the suppression of true emotions as a result of job demands). The frequency of behaviours are rated from 1 ('never') to 5 ('always').

Procedure

The study was advertised on LinkedIn and within a secure mental health hospital. The survey was hosted on Qualtrics. Following presentation of the information sheet, consenting participants were presented with the questionnaires, and directed to a debrief screen upon completion. Ethical approval was provided by the University of Central Lancashire and permission was also obtained from the hospital at which the lead author was based.

Results

Profiles of scores on measures

Descriptive statistics and internal consistency coefficients are presented in Table 1.

Table 1. Descriptive statistics and internal reliability coefficients for study one measures.

Measure (possible score range)	n	Median (IQR)	Min	Max	Internal consistency (α)
SPOS Total (0–48)	527	27 (19–36)	0	48	.92
MSPSS Total (12–84)	524	69 (60–75)	14	84	.91
ELS Surface acting (3–15)	526	8 (7–10)	3	15	.71
PC-PTSD Childhood Trauma Symptoms					
Whole sample (0–5)	*527*	*0 (0–0)*	*0*	*4.5*	*.84**
Childhood-exposed participants (0–5)	*154*	*1.5 (0.5–3.5)*	*0*	*4.5*	*.77**
BCSS					
Negative self (0–24)	*521*	*0 (0–3)*	*0*	*13*	*.72*
Negative other (0–24)	*504*	*3.5 (0–9)*	*0*	*23.5*	*.91*
MCQ-30 Total (30–120)	527	53 (45–64)	30	103	.91
MIESS-C					
Exposure (5–30)	527	14 (10–19)	5	29	.78
Symptoms (5–30)	527	13 (9–18)	5	30	.82

Notes. *n* = Number of participants with complete data on each measure; Descriptive statistics reported are calculated exclusive of missing cases; *α* = Cronbach's alpha.
*Indicates where the Kuder-Richardson 20 test was used to measure internal consistency of variables measured based on dichotomous scale items.

Serial mediation analysis

Serial mediation modelling was conducted to test for a mediating effect of childhood trauma symptoms, cognitive schemas and meta-cognitions in the link between PMIE exposure and moral injury. Mediation modelling requires the independent variable to be correlated with mediator and outcome variables (Hayes, 2013). Spearman's bivariate correlations indicated significant weak positive associations for PMIE exposure scores with childhood trauma symptoms (rs(536) = 0.19, $p < 0.001$), negative self- (rs(534) = 0.27, $p < 0.001$), and other schemas (rs(515) = 0.14, $p = 0.002$) and maladaptive metacognitions (rs(535) = 0.23, $p < 0.001$), and a strong positive association with moral injury (rs(538) = 0.92, $p < 0.001$).

Two serial mediation models were constructed to examine the effects of negative self and other schemas. Serial mediation analyses were conducted in R using model 6 of Hayes' PROCESS macro version 4.2 (Hayes, 2022), with 1000 bootstrapped re-samples. Bootstrapped confidence intervals for path coefficients which did not include 0 within the lower and upper value were indicative of statistical significance ($p < 0.05$). The models tested, and parameter estimates for paths between PMIE exposure and mediators (a-paths) and between mediators and moral injury symptoms (b-paths), are presented in Supplementary Figures S1 and S2.

Mediation model 1: Negative self schemas. The model (see Supplementary Figure S1) was tested on 524 (99.4%) participants with complete data on all variables. With the exception of the path between PMIE exposure and maladaptive metacognitions, all parameter estimates were significant ($p < 0.05$). Bootstrapped standard error estimates were also acceptable, ranging from 0.02 to 1.29. As indicated in Table 2, the simple indirect effects of PMIE exposure on moral injury via childhood trauma and via negative self-schemas, but not maladaptive metacognitions, were statistically significant. Serial mediating pathways were also significant, with indirect effects through all combinations of the three mediator variables.

Mediation model 2: Negative other schemas. The model (see Supplementary Figure S2) was tested on 506 (96.0%) participants with complete data on all variables. With the exception of the a- and b-paths between PMIE exposure, negative other schemas and moral injury, all other parameter estimates were significant. Bootstrapped standard errors were acceptable for all parameter estimates, ranging from 0.01 to 0.17. However, the paths between PMIE exposure, negative other schemas and moral injury were not significant, and thus the mediating effect of this variable in a serial model was not explored.

Moderated mediation analysis

Using model 89 of Hayes' PROCESS macro version 4.2 (Hayes, 2022), with 1000 bootstrap samples, the moderating effects of social support, organisational support, and emotional labour on the indirect effects of mediating variables were examined. As the indirect effect of negative other schemas on moral injury was non-significant in the mediation analysis, moderated mediation analyses were conducted on the negative self-schema model only. Whilst the a-path and indirect effect for maladaptive metacognitions was non-significant in this model, the parameter estimate for the b-path and serial pathways including this variable were significant (see Supplementary Figure S1). Therefore, this variable was retained in moderation analyses. Significance was again determined based on bootstrapped confidence intervals. Moderating variables were mean-centred to reduce multicollinearity (Frazier et al., 2004). Full results pertaining to the index of moderated mediation and conditional indirect effects for each model are presented in Table 3.

Moderated mediation model 1: Social support. The model was tested on 523 (99.2%) participants with complete data on all variables. A significant interaction was evident between social support and negative self-schemas, $b = 0.02$, $p = 0.02$, $R^2\Delta = 0.007$, and between social support and childhood trauma symptoms, b = −0.03, $p = 0.05$, $R^2\Delta = 0.005$, but not maladaptive metacognitions, $b = 0.002$, $p = 0.18$, $R^2\Delta = 0.002$. The index of moderated mediation

Table 2. Total, direct, and indirect effects of pathways between moral injury exposure and symptoms.

	b	SE	LLCI	ULCI
Total effect	8.04*	0.58	6.88	9.19
Direct effect	7.34*	0.57	6.22	8.47
Partially standardised indirect effects	*b*	*Boot SE*	*Boot LLCI*	*Boot ULCI*
Total indirect effect	0.11*	0.03	0.06	0.17
M1				
PMIE Exposure → Childhood Trauma Symptoms → MI	0.03*	0.02	0.00	0.07
M2				
PMIE Exposure → Negative Self Schemas → MI	0.04*	0.02	0.01	0.08
M3				
PMIE Exposure → Maladaptive Metacognitions → MI	0.02	0.01	−0.00	0.04
M12				
PMIE Exposure → Childhood Trauma Symptoms → Negative Self Schemas → MI	0.01*	0.01	0.00	0.03
M13				
PMIE Exposure → Childhood Trauma Symptoms → Maladaptive Metacognitions → MI	0.003*	0.002	0.00	0.01
M23				
PMIE Exposure → Negative Self Schemas → Maladaptive Metacognitions → MI	0.01*	0.01	0.00	0.02
M123				
PMIE Exposure → Childhood Trauma Symptoms → Negative Self Schemas → Maladaptive Metacognitions → MI	0.003*	0.002	0.00	0.01

Notes. *b* = unstandardised regression coefficient; SE = standard error; LLCI = lower level 95% confidence interval; ULCI = upper level 95% confidence interval; Number of bootstrap samples = 1000; * $p < 0.05$; PMIE = Potentially Morally Injurious Event; MI = Moral Injury.

was significant for the simple indirect effects of childhood trauma symptoms and negative self-schemas. The conditional indirect effect of childhood trauma symptoms was significant at low levels of social support only.

The index of moderated mediation was also significant for the *serial* indirect effect of childhood trauma symptoms and negative self-schemas. The conditional indirect effect of this serial mediation pathway was significant at all levels of social support, though was strongest at high levels (+1 SD) of the moderator.

Moderated mediation model 2: Organisational support. The model was tested on 524 (99.4%) participants with complete data on all variables. A significant interaction was evident between organisational support and childhood trauma symptoms, b = −0.04, $p = 0.02$, $R^2\Delta = 0.006$, but not negative self-schemas, b = −0.001, $p = 0.92$, $R^2\Delta < 0.001$, nor maladaptive metacognitions, b = −0.001, $p = 0.55$, $R^2\Delta < .001$. The index of moderated mediation was significant for the indirect effect of childhood trauma symptoms. The conditional indirect effect of childhood trauma symptoms was significant at low levels of organisational support.

Moderated mediation model 3: Surface acting. The model was tested on 523 (99.2%) participants with complete data on all variables. No significant interactions were evident between surface acting and childhood trauma symptoms, $b = 0.08$, $p = 0.42$, $R^2\Delta = 0.001$, negative self-schemas, b = −0.03, $p = 0.44$, $R^2\Delta = 0.001$, nor maladaptive metacognitions, b = −0.002, $p = 0.71$, $R^2\Delta < .001$. The index of moderated mediation was not significant for any indirect effects.

Summary

The findings indicated that staff exposed to early trauma may be at increased risk for moral injury due to a greater tendency to apply negative self-schemas in the appraisal of moral-based traumas (Pilkington et al., 2021; Young et al., 2003). The findings also indicate partial support for a mediating effect of metacognitions. Maladaptive metacognitions alone did not mediate the development of moral injury symptoms, contrasting research noting a driving effect on several psychopathologies (Sen Demirdogen et al., 2022). However, a sequential mediating effect was apparent, indicating that metacognitions may shape risk for moral injury in individuals with early trauma histories and negative other-schemas. The non-significant effect of negative other schemas may reflect a 'negative expectancy bias', whereby participants with more negative other schemas were more expectant of morally harmful acts, and thus the occurrence of such acts was less disruptive to beliefs about the world and others.

Moderating effects of social support and organisational support were also apparent, supporting the importance of positive social relationships in shaping risk for psychopathology (e.g. Evans et al., 2013; Sperry & Widom, 2013). The stronger mediating effect of negative self-schemas in those with high levels of social support may reflect a greater perception of social support as undeserved by those with more negative self-schemas, exacerbating guilt and shame. Additionally, organisations that do not value or prioritise employee well-being may adopt less compassionate responses

Table 3. Indexes and conditional indirect effects of moderated serial mediation pathways.

			Index of moderated mediation			Conditional indirect effect			
Moderator		Path	b	Boot SE	Bootstrap 95% CI	Condition	b	Boot SE	Bootstrap 95% CI
Social support	M1	PMIE Exposure → CT Symptoms → MI	**−0.01***	**.01**	**[−0.03, −0.00]**	**Low (−1 SD)**	**.28***	**.12**	**[.07, .54]**
						Moderate (M)	.14	.10	[−0.04, .37]
						High (+1 SD)	.01	.13	[−0.27, .28]
	M2	PMIE Exposure → NSS → MI	**.01***	**.01**	**[.00, .02]**	**Low (−1 SD)**	**.19***	**.11**	**[.02, .45]**
						Moderate (M)	**.33***	**.14**	**[.10, .62]**
						High (+1 SD)	**.48***	**.20**	**[.14, .93]**
	M3	PMIE Exposure → MM → MI	.00	.00	[−0.00, .02]				
	M12	PMIE Exposure → CT Symptoms → NSS → MI	**.00***	**.00**	**[.00, .01]**	**Low (−1 SD)**	**.06***	**.03**	**[.01, .14]**
						Moderate (M)	**.10***	**.04**	**[.03, .20]**
						High (+1 SD)	**.15***	**.06**	**[.05, .28]**
	M13	PMIE Exposure → CT Symptoms → MM → MI	.00	.00	[−0.00, .00]				
	M23	PMIE Exposure → NSS → MM → MI	.00	.00	[−0.00, .01]				
	M123	PMIE Exposure → CT Symptoms → NSS → MM → MI Symptoms	.00	.00	[−0.00, .00]				
Organisation support	M1	PMIE Exposure → CT Symptoms → MI	**−0.02***	**.01**	**[−0.04, −0.00]**	**Low (−1 SD)**	**.27***	**.12**	**[.06, .53]**
						Moderate (M)	.10	.09	[−0.08, .30]
						High (+1 SD)	−0.07	.15	[−0.40 .21]
	M2	PMIE Exposure → NSS → MI	−0.00	.01	[−0.01, .01]				
	M3	PMIE Exposure → MM → MI	−0.00	.00	[−0.01, .01]				
	M12	PMIE Exposure → CT Symptoms → NSS → MI	−0.00	.00	[−0.00, .00]				
	M13	PMIE Exposure → CT Symptoms → MM → MI	−0.00	.00	[−0.00, .00]				
	M23	PMIE Exposure → NSS → MM → MI	−0.00	.00	[−0.01, .00]				
	M123	PMIE Exposure → CT Symptoms → NSS → MM → MI	−0.00	.00	[−0.00, .00]				
Surface acting	M1	PMIE Exposure → CT Symptoms → MI	.03	.05	[−0.05, .13]				
	M2	PMIE Exposure → NSS → MI	−0.02	.03	[−0.09, .03]				
	M3	PMIE Exposure → MM → MI	−0.01	.02	[−0.05, .03]				
	M12	PMIE Exposure → CT Symptoms → NSS → MI	−0.01	.01	[−0.03, .01]				
	M13	PMIE Exposure → CT Symptoms → MM → MI	−0.00	.00	[−0.01, .01]				
	M23	PMIE Exposure → NSS → MM → MI	−0.00	.01	[−0.03, .02]				
	M123	PMIE Exposure → CT Symptoms → NSS → MM → MI	−0.00	.00	[−0.01, .00]				

Notes. PMIE = Potentially morally injurious event; CT = Childhood trauma; NSS = Negative self-schemas; MM = Maladaptive metacognitions; MI = Moral injury; b = standardised regression coefficient; SE = standard error; LLCI = lower level 95% confidence interval; ULCI = upper level 95% confidence interval; *$p < 0.05$; ***$p < 0.001$; significant effects indicated in bold; Regression coefficients for indirect effects reflect the predictive effect of the hypothesised moderated mediational pathway when adjusted for all other proposed mediator pathways.

to moral transgressions, and exacerbate self-blame and guilt appraisals in staff with histories of early trauma.

Study two: Pathways from moral injury

Study one indicated a role for early trauma and cognitive schemas in driving moral injury. Expanding on this, study two explores a cognitive-emotional pathway between moral injury and wider well-being adversities pertinent to secure mental healthcare staff.

Method

Participants

A voluntary sample of secure mental healthcare staff with at least 6 months experience were recruited between July and October 2023. Overall, 389 eligible staff participated. Following examination of Mahanalobis' distance values to identify multivariate outliers, four participants (1.0%) were excluded. Of the remaining 385 participants, 325 had complete data on predictor and mediator variables included in all tested models and were included in the final sample. Participants were aged 20–75 years (Median = 38.0, IQR 29–51), and were mostly female (61.8%), and working in a clinical role (75.7%), primarily nursing (39.5%), as well as psychology (23.6%), occupational therapy (3.9%), medicine (2.3%), social work (2.3%) and psychiatry (1.0%). Non-clinical occupations represented included administration (5.5%), education, training and development (4.2%), human resources (1.8%), housekeeping (1.6%), finance and maintenance (both 1.3%).

Measures

Moral injury. The 21-item Occupational Moral Injury Scale (OMIS; Thomas et al., 2023) was used as a measure of moral injury symptoms (guilt, shame, anger, existential conflict, loss of trust) following work-based PMIE exposure. Items are scored from 1 ("strongly disagree") to 7 ("strongly agree").

Outcome variables. The 10-item Kessler Psychological Distress Scale (K10; Kessler et al., 2003) was used as a measure of global psychological distress, assessing the frequency of anxiety and depression symptoms over the past 30 days from 1 ("none of the time") to 5 ("all of the time").

The somatisation subscale (12 items) of the Symptom Checklist-90 (SCL-90; Derogatis et al., 1973) was used to assess physical symptoms of distress (e.g. headaches, pains in chest) in the past week, with items rated from 0 ("not at all") to 4 ("extremely").

The Level of Personality Functioning Scale—Brief Form 2.0 (LPFS-BF 2.0; Weekers et al., 2019) was used to assesses the severity of impairment in 'self' (6 items) and 'interpersonal' (6 items) functioning, in accordance with the DSM-5 Alternative Model of Personality Disorders. Twelve items are rated in accordance with how true they are for the respondent, from 1 ("completely untrue") to 4 ("completely true").

The 7-item Nightmare Assessment Scale (NAS; Havens et al., 2019) was used to assess the presence and effect of nightmares before, during and after sleep. Each item is rated for its frequency over the last week, from 0 ("not at all") to 4 ("frequently").

Mediator variables. The 28-item Leahy Emotional Schema Scale II (LESS-II; Leahy, 2012) was used as a measure of beliefs about emotions. Respondents rate the extent to which they adopt fourteen schemas, from 1 ('very untrue of me') to 6 ('very true of me').

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was used as a measure of emotion regulation. Specifically, the four 'expressive suppression' items, each scored from 1 ('strongly disagree) to 7 ('strongly agree'), were included in analyses.

Moderator variables. The Toronto Alexithymia Scale (TAS; Bagby et al., 1994) was used to assess three domains of alexithymia (difficulty in identifying and describing emotions, and externally orientated thinking). Twenty items are rated from 1 ('strongly disagree') to 5 ('strongly agree').

Procedure

The recruitment and data collection processes utilised for study two mirrored those of study one. Ethical approval was obtained from the University of Central Lancashire and permission was sought from the hospital at which the lead author was based.

Results

Profiles of scores on measures

Descriptive statistics and internal consistency coefficients are provided in Table 4.

Serial mediation analysis

Serial mediation modelling was conducted to examine the mediating effects of maladaptive emotional schemas and expressive suppression in the path between moral injury and well-being outcomes. The methods applied in the analysis and interpretation of data are as captured in study one. Table 5 summarises the direct and simple and serial indirect effects of moral injury on well-being outcomes via emotional schema and expressive suppressive. The models tested, and parameter estimates for paths between moral injury and mediators (a-paths) and between mediators and well-being outcomes (b-paths), are presented in Supplementary Figures S3–S7.

Mediation model 1: Psychological distress. The model (see Supplementary Figure S3) was tested on 323 (99.4%) participants with complete data on all variables. The direct effect of moral injury on psychological distress was significant. With the exception of the

Table 4. Descriptive statistics and internal consistency coefficients for study two measures.

Measure	n	Median (IQR)	Min	Max	Internal consistency (α)
OMIS Total (20–140)	325	62 (36–86.5)	20	130	.96
K-10 Total (10–50)	323	18 (14–25)	10	49	.92
SCL-90 Total (0–48)	310	6.5 (3–12)	0	35	.88
LPFS-BF 2.0					
Self-functioning (6–24)	324	11 (7–15)	6	24	.88
Interpersonal functioning (6–24)	322	10 (7–12)	6	20	.76
NAS Total (0–28)	323	3 (0–8)	0	24	.86
LESS-II Total (28–168)	323	81 (69–95)	42	135	.85
ERQ Expressive suppression (4–28)	323	14 (10–18)	4	28	.79
TAS Total (20–100)	310	42 (36–52)	22	81	.87

Notes. *n* = Number of participants with complete data on each measure; Descriptive statistics reported are calculated exclusive of missing cases; α = Cronbach's alpha.

Table 5. Total, direct, and indirect effects of pathways between moral injury and well-being outcomes.

Outcome variable	Path		*b*	SE	LLCI	ULCI
Psychological distress	Total effect		0.10***	0.01	0.08	0.13
	Direct effect		0.03**	0.01	0.01	0.06
	Standardised indirect effects[a]					
	Total indirect effect		0.25*	0.03	0.19	0.31
	M1	MI → Emotional Schemas → Psychological Distress	0.25*	0.03	0.19	0.32
	M2	MI → Expressive Suppression → Psychological Distress	−0.00	0.00	−0.01	0.01
	M12	MI → Emotional Schemas → Expressive Suppression → Psychological Distress	0.00	0.01	−0.02	0.02
Somatic Symptoms	Total effect		0.09***	0.01	0.06	0.11
	Direct effect		0.02	0.02	−0.00	0.06
	Standardised indirect effects[a]					
	Total indirect effect		0.21*	0.03	0.15	0.28
	M1	MI → Emotional Schemas →Somatic Symptoms	0.23*	0.04	0.16	0.30
	M2	MI → Expressive Suppression → Somatic Symptoms	0.01	0.01	−0.00	0.02
	M12	MI → Emotional Schemas → Expressive Suppression → Somatic Symptoms	−0.02	0.01	−0.05	0.01
Nightmare Difficulties	Total effect		0.04***	0.01	0.02	0.05
	Direct effect		0.01	0.01	−0.01	0.03
	Standardised indirect effects[a]					
	Total indirect effect		0.14*	0.03	0.07	0.21
	M1	MI → Emotional Schemas → Nightmare Difficulties	0.14*	0.04	0.06	0.21
	M2	MI → Expressive Suppression → Nightmare Difficulties	0.00	0.01	−0.01	0.01
	M12	MI → Emotional Schemas → Expressive Suppression → Nightmare Difficulties	−0.00	0.01	−0.03	0.03
Self-Functioning Impairment	Total effect		0.05***	0.01	0.03	0.06
	Direct effect		0.01	0.01	−0.01	0.02
	Standardised indirect effects[a]					
	Total indirect effect		0.28*	0.03	0.21	0.35
	M1	MI → Emotional Schemas → Self-Functioning Impairment	0.29*	0.04	0.22	0.36
	M2	MI → Expressive Suppression → Self-Functioning Impairment	0.00	0.01	−0.00	0.02
	M12	MI → Emotional Schemas → Expressive Suppression → Self-Functioning Impairment	−0.01	0.01	−0.04	0.01
Interpersonal Functioning Impairment	Total effect		0.05***	0.01	0.03	0.06
	Direct effect		0.01	0.01	−0.01	0.02
	Standardised indirect effects[a]					
	Total indirect effect		0.28*	0.03	0.21	0.35
	M1	MI → Emotional Schemas → Interpersonal Functioning Impairment	0.29*	0.04	0.22	0.36
	M2	MI → Expressive Suppression → Self Functioning Impairment	0.00	0.01	−0.00	0.02
	M12	MI → Emotional Schemas → Expressive Suppression → Interpersonal Functioning Impairment	−0.01	0.01	−0.04	0.01

[a]Bootstrapped standard error and confidence interval values are reported.

Notes. MI = Moral injury; b = standardised regression coefficient; SE = standard error; LLCI = lower level 95% confidence interval; ULCI = upper level 95% confidence interval; *$p < 0.05$; ***$p < 0.001$; Significance of indirect effects was determined by lower and upper CIs that were both above or both below 0. Exact *p* value were provided for the total and direct effect.

a-path between PMIE exposure and maladaptive metacognitions, all other parameter estimates were significant. Bootstrapped standard error estimates were also acceptable, ranging from 0.02 to 1.29. The indirect effect of moral injury symptoms on psychological distress through negative emotional schemas was statistically significant (see Table 5). All other indirect effects were non-significant.

Mediation model 2: Somatic symptoms. The model (see Supplementary Figure S4) was tested on 310 (95.4%) participants with complete data on all variables. The direct effect of moral injury on somatic symptoms was not significant. Significant parameter estimates were found for the a and b-paths between moral injury, negative emotional schemas and somatic symptoms, with acceptable bootstrapped standard error estimates ranging from 0.01

to 0.09. However, the a- and b-paths between moral injury, expressive suppression and somatic symptoms were non-significant. The indirect effect of moral injury via negative emotional schemas was significant (see Table 5). All other indirect effects were non-significant.

Mediation model 3: Nightmare difficulties. The model (see Supplementary Figure S.5) was tested on 323 (99.4%) participants with complete data on all variables. The direct effect of moral injury on nightmare difficulties was not significant. Parameter estimates were significant for the a and b-paths between moral injury, negative emotional schemas and nightmare difficulties, with acceptable bootstrapped standard error estimates ranging from 0.01 to 0.37. However, the a- and b-paths between moral injury, expressive suppression and nightmares were non-significant. The indirect effect of moral injury on nightmare difficulties through negative emotional schemas was statistically significant. All other indirect effects were non-significant.

Mediation model 4: Self-functioning. The model (see Supplementary Figure S.6) was tested on 324 (99.7%) participants with complete data on all variables. The direct effect of moral injury on self-functioning impairment was not significant. Significant parameter estimates were found for the a and b-paths between moral injury, negative emotional schemas and self-functioning impairments, with acceptable bootstrapped standard error estimates ranging from 0.01 to 0.53. However, the a- and b-paths between moral injury, expressive suppression and self-functioning impairments were non-significant. The indirect effect of moral injury on self-functioning impairments through negative emotional schemas was statistically significant. All other indirect effects were non-significant.

Mediation model 5: Interpersonal functioning. The model (see Supplementary Figure S.7) was tested on 322 (99.1%) participants with complete data on all variables. The direct effect of moral injury on interpersonal functioning impairment was not significant. Significant parameter estimates were found for the a and b-paths between moral injury, negative emotional schemas and interpersonal functioning impairments. Additionally, the b-path between expressive suppression and interpersonal functioning impairment was non-significant, though the a-path between moral injury and expressive suppression was non-significant. Bootstrapped standard error estimates were acceptable, ranging from 0.01 to 0.63. The indirect effect of moral injury through negative emotional schemas was statistically significant. All other indirect effects were non-significant.

Moderated mediation analysis

Moderated mediation modelling was conducted to examine the moderating effect of alexithymia on the indirect mediating pathways between moral injury and well-being outcomes. The moderated mediation methods applied in the analysis and interpretation of data described in study one were also applied in study two. As the indirect singular and serial effects of expressive suppression on psychological distress, somatic symptoms, nightmare difficulties and self-functioning impairment were non-significant, this variable was removed from moderated mediation models for these outcomes. However, expressive suppression was retained in the moderated mediation model for interpersonal functioning impairment, as the b-path between these variables and the serial pathway through negative emotional schemas and expressive suppression was significant (see Supplementary Figure S.7). Full results pertaining to the index of moderated mediation and conditional indirect effects for each model are presented in Table 6.

Moderated mediation model 1: Psychological distress. The model was tested on 310 (95.4%) participants with complete data on all variables. The interaction between alexithymia and negative emotional schemas, $b = 0.003$, $p = 0.04$, $R^2\Delta = 0.008$, and the index of moderated mediation for the indirect effect of negative emotional schemas were significant. The conditional indirect effect of negative emotional schemas was significant at all levels of alexithymia, though was strongest at high levels of this moderator.

Moderated mediation model 2: Somatic symptoms. The model was tested on 299 (92.0%) participants with complete data on all variables. The interaction between alexithymia and negative emotional schemas, $b = 0.001$, $p = 0.79$, $R^2\Delta = 0.000$, and the index of moderated mediation for the indirect effect of negative emotional schema were non-significant.

Moderated mediation model 3: Nightmare difficulties. The model was tested on 310 (95.4%) participants with complete data on all variables. The interaction between alexithymia and negative emotional schemas, $b = 0.002$, $p = 0.10$, $R^2\Delta = 0.008$, and the index of moderated mediation for the indirect effect of negative emotional schema were non-significant.

Moderated mediation model 4: Self-functioning. The model was tested on 311 (95.7%) participants with complete data on all variables. The interaction between alexithymia and negative emotional schemas, $b = 0.003$, $p = 0.007$, $R^2\Delta = 0.013$, and the index of moderated mediation for the indirect effect of negative emotional schema were significant (see Table 6). The conditional indirect effect of negative emotional schemas was

Table 6. Indexes and conditional indirect effects of moderated serial mediation pathways.

			Index of moderated mediation			Conditional indirect effect			
Outcome		Path	*b*	*Boot SE*	Bootstrap *95% CI*	Condition	*b*	*Boot SE*	Bootstrap *95% CI*
Psychological Distress	M1	MI Symptoms → Emotional Schemas → Psychological Distress	**0.00***	**0.00**	**[0.000, 0.002]**	**Low (−1 SD)**	**0.03***	**0.01**	**[0.01, 0.06]**
						Moderate (M)	**0.05***	**0.01**	**[0.03, 0.07]**
						High (+1 SD)	**0.06***	**0.01**	**[0.04, 0.09]**
Somatic Symptoms	M1	MI Symptoms → Emotional Schemas → Psychological Distress	0.00	0.00	[−0.00, 0.00]				
Nightmare Difficulties	M1	MI Symptoms → Emotional Schemas → Nightmare Difficulties	0.00	0.00	[−0.00, 0.00]				
Self-Functioning Impairment	M1	MI Symptoms → Emotional Schemas → Self-Functioning Impairments	**0.001***	**0.00**	**[0.000, 0.002]**	**Low (−1 SD)**	**0.02***	**0.01**	**[0.01, 0.03]**
						Moderate (M)	**0.03***	**0.01**	**[0.02, 0.04]**
						High (+1 SD)	**0.04***	**0.01**	**[0.02, 0.06]**
Interpersonal Functioning Impairment	M1	MI Symptoms → Emotional Schemas → Interpersonal Functioning Impairment	−0.00	0.00	[−0.00, 0.00]				
	M2	MI Symptoms → Expressive Suppression → Interpersonal Functioning Impairment	.00	.00	[−0.00, .00]				
	M12	MI Symptoms → Emotional Schemas → Expressive Suppression → Interpersonal Functioning Impairment	0.00	0.00	[−0.00, .00]				

Notes. MI = Moral injury; b = standardised regression coefficient; SE = standard error; LLCI = lower level 95% confidence interval; ULCI = upper level 95% confidence interval; *$p < 0.05$; ***$p < 0.001$; Regression coefficients for indirect effects reflect the predictive effect of the hypothesised moderated mediational pathway when adjusted for all other proposed mediator pathways.

significant at all levels of alexithymia, though was strongest at high levels of this moderator.

Moderated mediation model 5: Interpersonal functioning. The model was tested on 307 (94.5%) participants with complete data on all variables. The interaction effect of alexithymia and negative emotional schemas, b = −0.001, $p = 0.32$, $R^2\Delta = 0.002$, and alexithymia and expressive suppression, $b = 0.003$, $p = 0.25$, $R^2\Delta = 0.003$ were non-significant. The index of moderated mediation was not significant for the indirect effects of negative emotional schema nor expressive suppression.

Summary

The results showed a partial mediating effect for emotional schemas in the psychological distress model, indicating that cognitions about emotions somewhat drive psychological outcomes associated with moral injury (Leahy et al., 2019). Furthermore, a full mediating effect of negative emotional schemas was apparent in the pathways between moral injury symptoms and somatic symptoms, nightmare-related difficulties, and impairments in self- and interpersonal functioning. These findings support the central tenant of *Emotional Schema Theory* (Leahy, 2002) that thoughts about emotions drive psychopathology, but also widens this to somatic, sleep and personality functioning outcomes.

No simple or serial mediating effects of expressive suppression were apparent in the psychological distress, somatic symptoms, nightmare-related difficulties and self-functioning models. The significant parameter for the path between emotional schema and expressive suppression further supports the tenant of Emotional Schema Theory that thoughts about emotions are an antecedent to difficulties in emotion regulation. However, in contrast to previous research (Deplancke et al., 2023; Faustino & Vasco, 2023), the role of expressive suppression in driving the effects of maladaptive emotional schemas on poor psychological well-being outcomes was not supported. The role of emotion regulation in driving well-being outcomes is therefore positioned primarily as an artefact of the underlying emotional schemas.

In line with hypotheses noting the interpersonal consequences of failing to express emotions (Gross & John, 2003), a serial mediating effect of emotional schemas and expressive suppression was found for the interpersonal functioning model, however. This finding indicates that the association between moral injury and relational outcomes is driven by

maladaptive thoughts about emotions and, in turn, the suppression of emotions.

Finally, the mediating effects of emotional schema in the psychological distress and self-functioning models were moderated by alexithymia. In accordance with earlier research (Hormozi et al., 2022), the mediating role of schemas in these pathways was greatest in participants with high levels of alexithymia. These results indicate that the strength of beliefs about emotions as a driver of psychological and self-functioning outcomes is influenced by emotion recognition capacities. The mediating effect of emotional schema on somatic symptoms, nightmares and interpersonal-functioning impairments did not vary as a function of alexithymia, however, positioning beliefs about emotions as the core driver of the somatic, physiological and functional impacts of moral injury.

General discussion

Overall, the findings offer several theoretical implications for understanding the proliferation of PMIE exposure into moral injury and wider well-being outcomes. Principally, the findings provide support for a developmentally grounded and cognitively orientated model linking PMIE exposure, moral injury and wider well-being outcomes. Principally, cognitive processes, which are shaped by early life experiences, are implicated as the primary target for interventions addressing moral injury and wider associated outcomes.

In support of a developmental approach, the mediating effects found for childhood trauma symptoms position exposure to impactful early adverse experiences as a risk factor for moral injury, following PMIE exposure. Whilst individuals exposed to early adversity may be more prone to experiencing a PMIE, perhaps due to hypervigilance towards betrayal, the mediating effect of childhood trauma symptoms in the current research indicates that they may also present with an increased vulnerability for negative moral emotions, such as guilt and shame (Gross & Hansen, 2000; Lopez et al., 1997).

Across both studies, the key role of meta-level processes was evident from the findings. Specifically, the findings suggest that cognitions about cognitions (metacognitions) and cognitions about emotions (metaemotions) may contribute to risk for the development of moral injury and additional adverse well-being outcomes, to some extent. The mediating effect of metacognitions in driving moral injury alongside childhood trauma symptoms and negative self-schemas may be accounted for by associated problems in 'mentalisation', which refers to the integration of knowledge about the mental states of the self and others to understand behaviours and is underpinned by metacognitive capacities (Wu et al., 2020). Mentalisation is suggested to develop in the context of secure attachment relationships (Liotti & Gilbert, 2011), and problems in this domain have been ascribed as a core feature of clinical populations frequently exposed to early adversity (Mitchell & Steele, 2021). Thus, people exposed to early traumatic experiences may be less able to make inferences about the intentions and cognitive and emotional experiences of others who engage in morally transgressive behaviours, and accordingly are more at risk for applying morally injurious appraisals following exposure to transgressions and betrayals.

Furthermore, the role of meta-level cognitive processes, namely thoughts about emotions, in the subsequent development of psychological, somatic, sleep and functional outcomes was also apparent. This finding supports the notion that the way in which an individual makes sense of their emotions is a key driver of further emotional outputs (Leahy, 2002). Based on previous research, it is hypothesised that differential negative emotional schemas may be implicated in the pathways between moral injury and the psychological, somatic, sleep and functional outcomes examined in the constructed models (Leahy, 2022), though further research is necessary to confirm this.

Less support was obtained for emotion regulation mechanisms, with limited moderating effects found for expressive suppression. The pathway between emotional schema and expressive suppression was significant, in line with previous research indicating that cognitive processes drive emotion regulation and functioning (e.g. Edwards & Wupperman, 2019). However, the role of emotion regulation processes in driving well-being outcomes are positioned by the current findings as primarily an artefact of their relationship with emotional schema styles. Thus, a developmental-cognitive model is primarily supported.

Integrated Pathway Model of Moral Injury: Proposed conceptual model

Drawing on the findings of the current research and earlier works (Webb et al., 2024, 2025), the 'Integrated Pathway Model of Moral Injury (IPM-MI)' is proposed (see Figure 1). The IPM-MI draws on several existing models of trauma and psychopathology and integrates these to describe the pathways to moral injury and associated well-being outcomes.

A core tenant of the IPM-MI is the grounding of the model in a systemic context.

Whilst several individual-level mechanisms are implicated in the pathways succeeding PMIE exposure, it is acknowledged that the effects of such mechanisms in driving risk for moral injury operate within an enabling organisational culture. The environment in which staff are working is positioned as the preliminary root of the model, driving the initial occurrence of PMIEs (Webb et al., 2024, 2025). The current findings expand on this root component.

Drawing on the findings of study one, the IPM-MI implicates childhood trauma symptoms, cognitive schemas and maladaptive beliefs about cognitions as key mechanisms that indirectly facilitate the development of moral injury symptoms in response to exposure to a PMIE. The model recognises the dual role for childhood trauma in driving risk for moral injury, both in increasing risk for PMIE exposure as a result of vigilance to betrayal, but also via cognitive structures that increase vulnerability to this syndrome. However, the model also captures the significant path between PMIE exposure and negative self-schemas indicating that, whilst

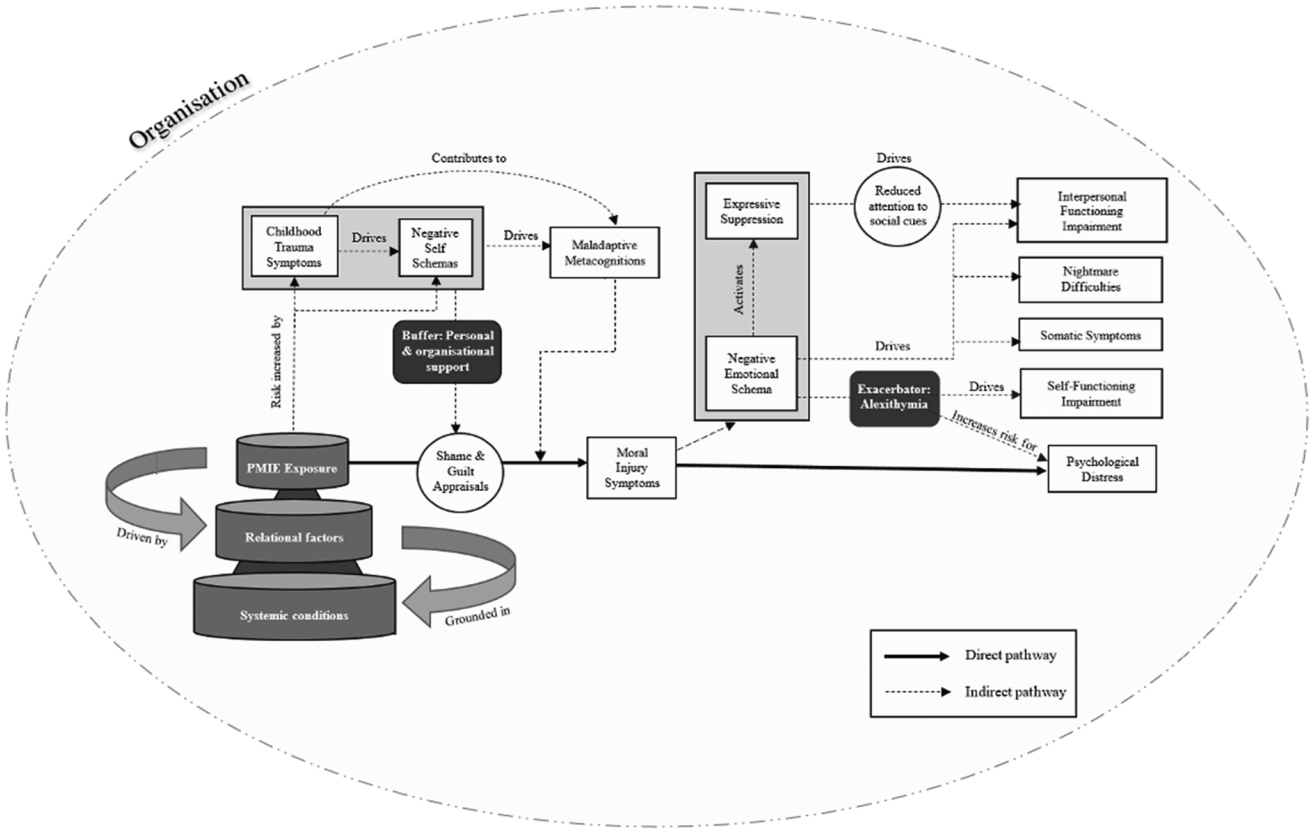

Figure 1. Integrated Pathway Model of Moral Injury (IPM-MI).

maladaptive cognitions about the self are commonly the product of early adverse experiences, they remain a risk factor for increased PMIE exposure in those not experiencing childhood trauma-related symptoms.

The role of personal and organisational support, which were found to affect the strength of the mediating effects of childhood trauma symptoms and negative self-schemas, are also captured in the model. Such findings support the *Socio-Interpersonal Framework Model of PTSD* (Maercker & Horn, 2012), which posits that positive social interactions following a trauma can inhibit the development of adverse symptoms by altering the structure of the trauma memory. Given that PMIEs are not necessarily always avoidable, organisational responses following the occurrence of a PMIE, as secondary prevention strategies, are arguably of equal importance to primary prevention responses. Working in an organisation that actively seeks to support staff in navigating moral challenges, such as through the provision of ethical consultation panels and appropriate but non-punitive approaches to investigations, may aid in removing individually directed blame and reducing ostracisation by colleagues.

Considering the findings of study two, and drawing on the principles of Emotional Schema Theory (Leahy, 2002), negative cognitions about emotional states are implicated as the primary mechanism linking moral injury with psychological distress, somatic symptoms, nightmares and functioning impairments in the IPM-MI. In consideration that the complete eradication of risk for moral injury in secure mental healthcare workers is unrealistic given the inherent moral dilemmas that may be posed in such a context (Webb et al., 2024), and that shame and guilt may be warranted responses to transgressions in certain situations, addressing beliefs about moral emotions may reflect a potentially beneficial avenue for intervention.

The sequential mediating effect of expressive suppression found on interpersonal functioning impairment is presented in the model as a function of reduced attention to social cues. Previous studies have indicated expressive suppression to have adverse interpersonal impacts (see Chervonsky & Hunt, 2017), formulated as a consequence of the fixation of attention to the self that is required to suppress one's own emotional states (Gross, 2015; Sun & Lau, 2018). Drawing on the tenants of the *Emotions as Social Information (EASI) model* (Van Kleef, 2009), the IPM-MI proposes that this attentional bias towards the self inhibits cognitive capacity to attend to social and emotional cues from others that may facilitate the development of relationships.

Practice implications

Whilst the purpose of the research was not to develop treatment recommendations, the proposed model indicates several tentative suggestions that may aid in mitigating risk for moral injury and associated adversities in secure mental health staff.

Primarily, the findings of the current research, as well as a preceding systematic review and Delphi study (Webb et al., 2024, 2025) position a key role for systemic solutions to addressing moral injury in the secure mental healthcare workforce. The moderating effect of organisational support

on the pathway between PMIE exposure and moral injury via childhood trauma symptoms indicates that systemic strategies may aid in buffering against the development of moral injury, by mitigating the activation of negative schemas pervasive in those exposed to early traumas. Such systemic responses proposed to be important in mitigating risk include the organisational provision of accessible forums to consult, reflect on and seek support for morally transgressive incidents; the integration of a non-punitive, 'lessons learnt' approach to investigations and disciplinary processes; and the embedding of a 'no fault' approach in the face of difficult clinical decisions made by staff (Morris et al., 2024).

Secondly, the buffering effects found for support systems position the need for strategies that seek to build and strengthen interpersonal relationships, both within and outside of the workplace, in this occupational group. Staff are commonly recruited from overseas countries into the UK healthcare system (NHS Digital, 2021), and the full-time operation of healthcare requires many staff to work long shift patterns and unsociable hours, which bears potential adverse effects on social functioning and relationships (Arlinghaus et al., 2019; Qanash et al., 2021). Accordingly, implementing strategies to meet the social needs of the secure mental healthcare workers, reflects a key priority, particularly as moral injury may exacerbate social withdrawal (Rosen et al., 2022).

Principally, the findings also support the potential utility of cognitive interventions in reducing risk for moral injury and wider adverse well-being outcomes following PMIE exposure. Importantly, the need to consider higher-order cognitive processes in interventions, namely beliefs about emotions and cognitions, is likely to be key. The current research indicated that the complete eradication of risk for moral injury in secure mental healthcare workers is unlikely and unrealistic, given the inherent moral dilemmas that may be posed by working in such a context. Additionally, as indicated previously, shame and guilt may be warranted emotions to transgressions in certain scenarios (Gray et al., 2017). The findings of the current research support the potential utility of addressing beliefs about appraisals of transgressive experiences and beliefs about moral emotions.

Limitations

The research is limited by the use of retrospective, cross-sectional data to explore mechanistic pathways. Accordingly, the temporal nature of the proposed mechanisms remains hypothetical and causal inferences cannot be confirmed. Additionally, self-report measures were relied on, requiring participants to accurately evaluate their capacities in an area that they may be deficit in. In addition, whilst the findings propose tentative hypotheses about potential pathways linking PMIE exposure, moral injury and wider facets of well-being, no concrete conclusions can be drawn from the findings. Both studies also utilised a voluntary sample of staff from several professional groups not equally represented. Whilst the inclusion of a multi-disciplinary sample is in many ways a strength, mirroring the configuration of the secure mental healthcare workforce, the validity of the model in different demographic groups cannot be established. In particular, there is need for future research to consider the applicability of the model across ethnic groups, as a characteristic shown to potentially influence responses to PMIEs (Morris et al., 2022b).

Conclusion

The current research sought to further the conceptualisation of moral injury, namely the underlying mechanistic processes, in secure mental healthcare staff. Drawing on several interdisciplinary theories not before applied to moral injury and supporting evidence from the current research, a conceptual integrative model is proposed. The model positions mechanistic roles for early adverse experiences and cognitive processes in the pathways to and from moral injury, in addition to recognising the contributions of social influences. The findings arguably propose implications for the prevention and management of moral injury in secure mental healthcare staff that warrant piloting and evaluation in future research.

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- Informed consent was obtained from all individual participants included in the study.
- Ethical approval was granted by the University of Central Lancashire Science Ethics Committee (approval no's. SCIENCE 0161 and SCIENCE 01023).
- In line with the conditions of ethical approval provided for the study, the data cannot be distributed beyond the research team and thus is not publicly available.

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