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Impact of Caring for Terminally Ill Children on Physicians: A Systematic Scoping Review

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Abstract

Introduction: Caring for terminally ill children influences nurses' and allied health provider's quality of life, ability to provide personalized, dignified and empathetic care and even their concepts of personhood. In the absence of data this review utilizes the Ring Theory of Personhood (RToP) to evaluate how a physician's concept of personhood is affected caring for terminally ill children in order to better support them holistically. **Methods:** Using PRISMA Guidelines, 14 researchers carried out independent searches of PubMed, CINAHL, PsycINFO, Cochrane Library and gray literature databases for articles published between 2000 to 2019. Concurrent and independent employment of content and thematic analysis (Split Approach) was used to enhance the trustworthiness of the analysis. **Results:** 13,424 titles and abstracts were retrieved, 188 full texts were evaluated, and 39 articles were included and analyzed. Identical categories and themes identified using the Split Approach suggest that caring for dying children in PPC impacts the physician's professional identity, clinical decision making, personal well-being and relationships. The data also suggests that the magnitude of these effects depends on the presence of protective and risk factors. **Conclusion:** Aside from providing a novel insight into the upon the physician, this review proffers a unique approach to accounting for the presence, magnitude and influence of incoming catalysts, resultant conflicts, and protective and risk factors upon the physician's personhood. Further studies into the changes in personhood are required. Design of a personalized assessment tool based on the RToP will help direct timely, appropriate and personalized support to these physicians.

Keywords

personhood, pediatric, palliative care, terminal ill, physicians, the ring theory of personhood, selfhood, burnout

Introduction

Caring for terminally ill children in Pediatric Palliative Care (PPC) has complex and lasting effects upon the personal, familial, professional and societal ties and roles of nurses and other allied health professionals.[1-6] However, the effects upon physicians remain poorly understood thus compromising support proffered to them. Efforts to address this dearth of data have redoubled amid growing pediatric deaths as a result of the COVID-19 pandemic.[7] As put forth by western existential philosophy, dissonance arises when a person is confronted with their human existence and fallibility.[8-12] Indeed, social historian Philip Ariès advances the notion that there exists "a permanent relationship between one's ideas of death and one's idea of oneself."[13] As such, in addition to their fraught working environment, there is growing concern that

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the experiences of caring for dying children may impact how healthcare professionals (HCP)s conceptualize their personhood or "what makes you, you."[14-18] Understanding this link is critical given that how a HCP conceives their own personhood influences their decision making, their ability to provide personalized, dignified, safe and empathetic clinical care and their perceptions of their own quality of life and job satisfaction.[14-20]

With so little known as to how caring for terminally ill children may affect the personhood of physicians, and given its likely impact on patient care and safety, better understanding[21] will enhance holistic and longitudinal assessment and support of physicians in PPC and beyond, particularly as physicians face death and dying at unprecedented levels during the COVID-19 pandemic.[14-18]

The Ring Theory of Personhood

There are a number of methods of conceptualizing personhood. Tsai's[18] 2 dimensional concept of personhood successfully captures what it is to be an individual within a Confucian based society, highlighting the interrelatedness of human connectedness to the family unit and the society.[22] Buron's[23] Levels of Personhood considers the biological, individual and sociological concept of personhood and like Kitwood's[2] concept, focuses on personhood in the dementia setting, offering a well evidenced albeit static perspective. Dennett's[24] concept further includes the ability to communicate and recognize intentional mental states in others. While most of these concepts incorporate Locke[25] and Kant[26] formulations that include conscious function, intelligence, rationality and self-awareness, moral value, enduring interests[17,27-32] and legal status,[33] these models notably fail to consider complex changes that arise in clinical settings especially in Palliative Medicine.

To advance thinking on the matter and better capture the effects of caring for terminally ill children in the PPC, a more responsive concept capable of capturing individual perspectives of personhood over time and in diverse settings is required. The Ring Theory of Personhood (RToP),[4,34-47] an evidenced based tool used to characterize changes to self-concepts of personhood among Palliative Care patients is thus proposed.[2-6,34,35,45] The RToP[4,34,35,45] consists of 4 concentric rings that correspond to the Innate, Individual, Relational and Societal Ring (Figure 1).

The innermost ring, the Innate Ring, represents elements that are unchanging from the moment an individual is conceived until their demise. The Innate Ring encapsulates the individual's connection with the Divine, and or their genetic makeup that identifies them as a human being.[2-6] It ensures that the individual is treated as a person throughout their lifetime.

Building upon the "human state" accorded by the Innate Ring, the Individual Ring represents the conscious function of a human being. The Individual Ring encapsulates those characteristics related to an individual's ability to communicate and display emotions.[2-6,14-16]

The Relational Ring, in turn, represents the close personal ties that the individual shares with other individuals and which the individual determines to be important to them.[2-6]

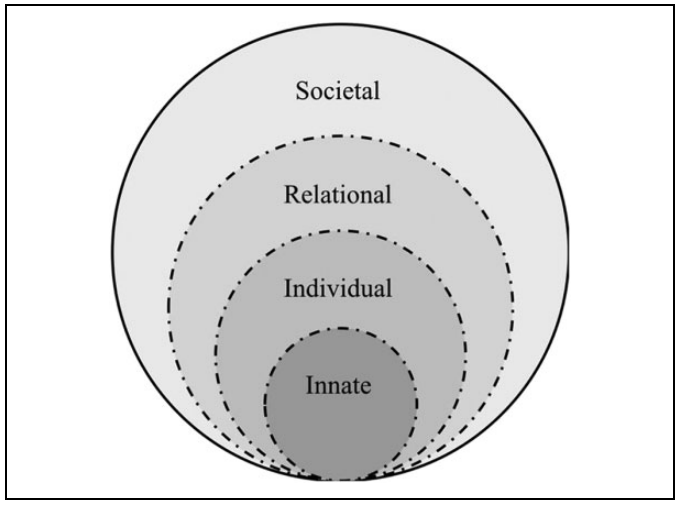

Figure 1. Ring theory of personhood[4] dotted lines signify permeability and interrelatedness.

The Societal Ring, the outermost ring, houses social expectations, cultural norms, professional standards and religious obligations that, along with familial duties and ties, delineate codes of conduct and practice expected of the individual and of the roles that they occupy.[2-6]

The interconnected nature of these rings is highlighted by the fact that the Societal Ring endows the person with the legal status and ethical and sociocultural standards to which all persons in that nation and community possess. These rights and considerations remain for as long as the individual is alive and often includes how the person will be respected posthumously. The entwined nature of the rings also explains the "wider" role of the Individual Ring. The Individual Ring "channels" or acts as a conduit for the values, beliefs and principles drawn from the individual's religious beliefs in their Innate Ring, their professional and personal ethos that reside within their Individual Rings, their beliefs on how to interact and standards of practice that guides their relationships in the Relational Ring, and the legal and professional values, principles and standards that reside within their Societal Ring. These values, beliefs and principle thus guide how the individual thinks, makes decisions, acts and reflects on experiences.

A further feature of the RToP is the fluid nature of interactions between the rings which capture the dynamic/evolving nature of self-concepts of personhood.[4] A physician caring for terminally ill children may have strong relationships with family members and friends that "expand" their Relational Ring. Conversely, the experiences may see them drifting away from their friends over time, in part due to work and time pressures and or physical distance given their increasing professional responsibilities.

The same physician may determine that their relational ties are now less important and may find their professional roles and religious ties more fulfilling. This results in the shrinking of the Relational Ring and subsequent enlargement of the Innate and Societal Rings. This exemplifies the adaptive nature of the RToP that is focused upon preserving self-concepts of personhood.[4] The RToP does this by drawing upon the other

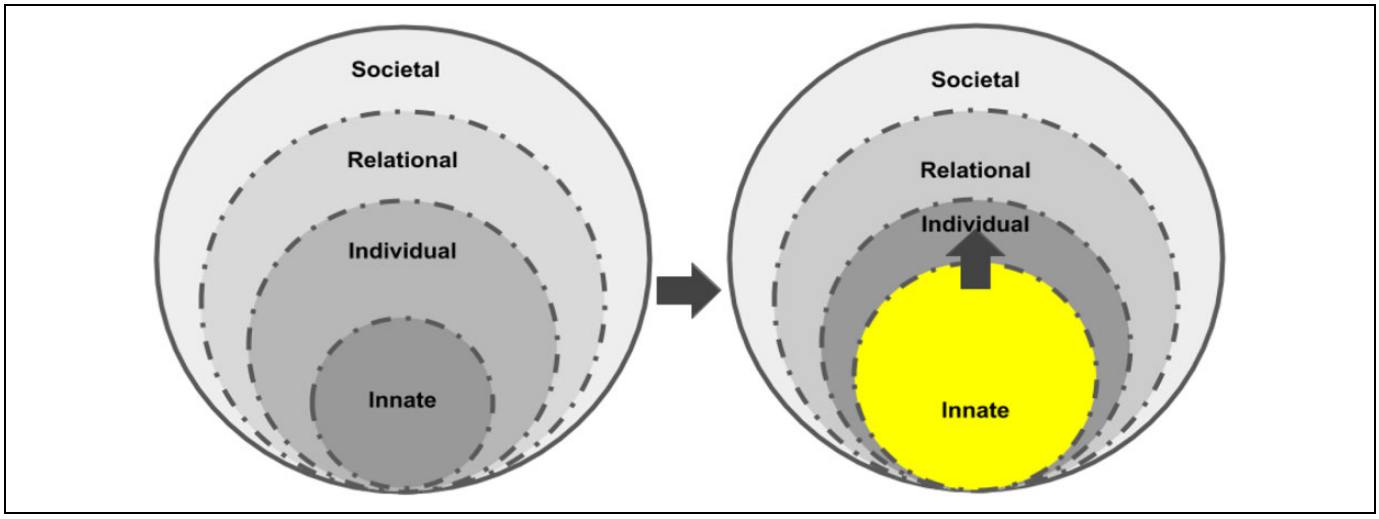

Figure 2. The adaptive nature of the Ring Theory of Personhood[4] is evident in changing sizes of the globes while the compensatory nature of the Ring Theory of Personhood[4] is evident in the maintenance of the overall size the rings.

rings to preserve the personhood of the individual when a ring is compromised or changes (Figure 2).[4] The compensatory aspect of personhood is most evident when an individual loses their consciousness and thus their Individual Ring. Here, the Relational Ring acts to preserve the personhood of the individual in the manner that would be consistent with the individual's wishes, values and beliefs.

Changes in the size of the rings suggested by the adding and subtracting of factors either by addition of facets to a ring or "demotion" of factors such as the relegation of a relationship with a family member previously considered important to the physician from the Relational Ring to one in the Societal Ring also reveals the dimensions of the rings. Here the height of the rings is determined by the number of elements within the ring while the importance of the elements within the rings represent the "width" of the rings. Here the more important an element is within the ring the closer it is to its center.

Sharing a similar anatomy, the RToP's concentric rings expand on Bronfenbrenner's Ecological Systems Theory[48] which foregrounds the influence of individual historical, social and environmental factors on the meaning-making capacities of the growing child. Described as a "person process-context model," an individual's development is acknowledged as highly personalized and guided by internal and external forces. This idea of social-embeddedness is also echoed in Hobfoll's Conservation of Resources Theory[49] which positions the individual as firmly nested within families and "tribes" or intimate social groups. These relationships influence one's thoughts, behaviors and, critically, concepts of oneself. Overlapping with elements contained within the RToP rings, resources are "defined as those objects, personal characteristics, conditions, or energies that are valued in their own right." Notably, traumatic stress is identified as a potential by-product of compromises to these resources.

These theories validate the notion that professional responsibilities, moral duties and concepts such as mortality may be perceived and internalized differently by healthcare professionals in the same work setting. Great variations may arise in how their sense of self and self-worth are affected, with potentially different repercussions and ripples experienced across the rings of their personhood.

These features thus underscore RToP's versatility in illustrating changes within the Innate, Individual, Relational and Societal Rings of one's personhood in the PPC setting. Indeed a better understanding of these changes will allow academic programs and clinical units to better support these physicians tasked with the difficult duty of caring for the dying young.[50]

Methods

To address concerns surrounding the analysis of current studies and the synthesis of a coherent narrative from the multiple accounts of clinicians caring for terminally ill children, we introduce a novel approach called the systematic evidenced based approach (SEBA). SEBA will facilitate accountable, transparent and reproducible means of identifying patterns, relationships and disagreements[51] across a wide range of study formats and settings[52,53] in the synthesis of systematic scoping reviews (henceforth SSRs in SEBA). SSRs in SEBA are built upon a constructivist perspective, enabling it to map a complex topic from multiple angles[54] The SSR in SEBA is carried out by a team of researchers with input from an expert team consisting of medical librarians and local and overseas clinicians.

In keeping with SEBA, the research team adopted the principles of interpretivist analysis, to immerse themselves in the data through repeated reading and/or analysis of qualitative data; reflexivity and discussions to piece together data in a meaningful manner.[55-58] The SEBA process comprises the following elements: 1) Systematic Approach, 2) Split Approach, 3) Jigsaw Perspective, 4) Reiterative Process 5) Synthesis of SSR in SEBA. This is outlined in Figure 3 and will be applied and elaborated on further throughout the paper. The expert team was consulted at each stage of the SEBA process.

Stage 1 of SEBA: Systematic Approach

i. Determining the title of the review and background of the review

The expert team and research team worked together to determine the overall goals of the SR and the population, context and concept to be evaluated. To ensure a holistic picture was captured, the term "physician" encompasses pediatricians, neonatologists, emergency physicians, general practitioners, palliativists and oncologists who may provide care to terminally ill children.

ii. Identifying the Research Question

Guided by the population, concept and context, the research team and the expert team determined the research question to be "What is known about the impact of caring for children with life-limiting illness on the physician's personhood?"

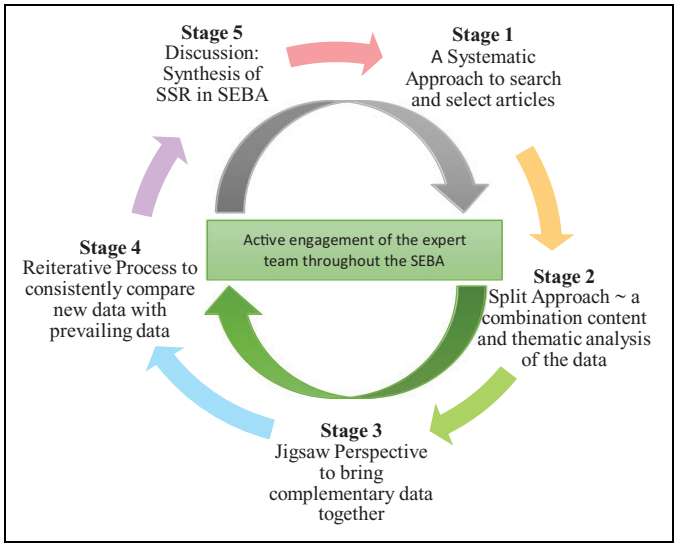

Figure 3. The SEBA process.

iii. Inclusion criteria

All gray literature, peer reviewed articles, narrative reviews, systematic, scoping and systematic scoping reviews published from 1st January 2000 to 31st December 2019 were included. A PICOS format was adopted to guide the research processes [59,60] (Table 1).

iv. Searching

Guided by the expert team, the research team proposed a search strategy including the keywords "physicians," "terminally ill," "pediatric," "burnout" and "satisfaction" and focused upon the PubMed, CINAHL, PsycINFO, Cochrane Library OpenGrey, and EBSCO Open Dissertations databases. Only articles published between 1 January 1990 and 31 December 2019 were selected in order to accommodate manpower and time constraints that the research team faced.[61] Searches were carried out between 17th January 2020 to 14th February 2020.

The PubMed search strategy may be found in Appendix A.

v. Extracting and charting

Using the abstract screening tool, members of the research team independently reviewed the titles and abstracts identified by each database to identify the final list of articles to be reviewed. Sambunjak, Straus, Marusic's[62] approach to "negotiated consensual validation" was used to achieve consensus on the final list of articles to be included. The research team independently reviewed all the titles on the final list, discussed them online to achieve consensus on the final list of articles to be analyzed.

Stage 2 of SEBA: Split Approach

Concurrent use of content and thematic analysis is a feature of the split approach[63] employed to enhance the validity of the analysis. Independent use of the Hsieh and Shannon's approach

Table 1. PICOS Table With Detailed Inclusion/Exclusion Criteria.

PICOS	Inclusion criteria	Exclusion criteria
Population	• Physicians involved in the care of dying children, including fellows and trainees of relevant subspecialties.	• Other health professionals within the primary care team of the patient (e.g. Nurses, Medical Students, Allied Health Professionals, etc)
Intervention	• Activities related to care provision for patients < 18 years and with life-limiting illness (i.e. requiring critical care, palliative, end-of-life care services)	• Activities related to care provision for patients > 18 years or patients whom do not have life-limiting illness
Outcome	• Impacts of the intervention on the physician's biopsychosocial well-being	
Study design	Full text articles in English or translated to English • All study designs including mixed methods research, meta-analyses, systematic reviews, randomized controlled trials, cohort studies, case-control studies, cross-sectional studies, descriptive papers and gray literature • Year of Publication: 1 January 2000–31 December 2019	• Analyses which fails to consider physicians as a separate subgroup

to directed content analysis[64] and Braun and Clarke's approach to thematic analysis[65] was adopted over concerns about the novel use of RToP to guide the directed content analysis process. In addition, independent use of Braun, Clarke's[65] approach to thematic analysis enhances researcher reflexivity given that 2 senior members of the research team were involved in Radha Krishna et al's[34,35,45] studies on the RToP. It also served as a means of confirming the evidence and improving objectivity, as a form of triangulation and as a method of enhancing the validity of the findings.[66] Furthermore, initial disparity between the categories and themes identified ensured a careful review of the data by both approaches and underlined the iterative process used in analysis of the data.

Three teams of researchers simultaneously and independently reviewed the included full-text articles. The first team summarized and tabulated the included full-text articles in keeping with recommendations drawn from Wong, Greenhalgh, Westhorp, Buckingham, Pawson's[54] RAMESES publication standards: meta-narrative reviews and Popay, Roberts, Sowden, Petticrew, Arai, Rodgers, Britten, Roen, Duffy's[67] "Guidance on the conduct of narrative synthesis in systematic reviews." The tabulated summaries served to ensure that key aspects of included articles were not lost.

Concurrently, the second team analyzed the included articles using Braun, Clarke's[65] approach to thematic analysis.[63] In phase 1 of Braun and Clarke's approach, the research team carried out independent reviews, "actively" reading the included articles to find meaning and patterns in the data.[66,68-71] In phase 2, "codes" were constructed from the "surface" meaning and collated into a code book to code and analyze the rest of the articles using an iterative step-by-step process. As new codes emerged, these were associated with previous codes and concepts. In phase 3, the categories were organized into themes that best depict the data. An inductive approach allowed themes to be "*defined from the raw data without any predetermined classification.*"[70] In phase 4, the themes were refined to best represent the whole data set and discussed. In phase 5, the research team discussed the results of their independent analysis online and at reviewer meetings. "*Negotiated consensual validation*" was used to determine a final list of themes approach and ensure the final themes.

A third team of researchers employed Hsieh, Shannon[64] approach to directed content analysis.[64] To test this hypothesis and lend weight to the posit that the effects of caring for terminally ill children impacted the physician's concept of personhood, a separate research team comprising 6 members not involved in the thematic analysis, adopted Hsieh, Shannon's[64] directed content analysis approach to analyze the included articles. Analysis using the directed content analysis approach involved "*identifying and operationalizing* a priori *coding categories.*"[64,72-76]

The first stage saw the research team draw codes from Krishna's RToP to guide the coding of the articles. Any data not captured by these codes were assigned a new code. In keeping with deductive category application, coding categories were reviewed and revised as required.

In the third stage, the research team discussed their findings online and used "negotiated consensual validation" to achieve consensus. The final codes were compared and discussed with the final author, who checked the primary data sources to ensure that the codes made sense and were consistently employed. Any differences in coding were resolved between the research team and the final author. "Negotiated consensual validation" was used as a means of peer debrief in all 3 teams to further enhance the validity of the findings.[77]

Stage 3 of SEBA: Jigsaw Perspective

The jigsaw perspective brings together complementary data to firstly create a cohesive picture of the impact of caring for terminally ill children on physicians' personhood and secondly to ensure that critical aspects of the data is not lost in the funneling process that follows.

Results

A total of 13,424 titles and/or abstracts were screened, 188 full text articles were evaluated, and 39 articles were included (Figure 4). A summary of the included articles is shown in Appendix B.

Themes Identified Through Braun and Clarke's Approach to Thematic Analysis[63]

There were 7 themes identified. Four were related to the 4 rings of the RToP. The fifth and sixth themes referred to protective and risk factors to each of the rings. The seventh theme related to emotional and psychological factors that affected more than 1 ring. These are difficulty empathizing with others.[78,79] difficulty playing their role in the family setting.[78] burn-out.[80-86] Acute Stress Reaction (ASR) or Post Traumatic Stress Disorder (PTSD)[87-89] and difficulty empathizing with others.[78,79]

Categories Identified Hsieh and Shannon (2005)'s[64] Method to Directed Content Analysis Approach

Four of the 5 categories identified correspond to the 4 rings of the RToP. The fifth category included those aspects that did not fit into just one of the categories.

Funneling

A funneling approach was adopted to streamline results from the 2 aspects of the Split Approach[63] and sees data compared and combined to reduce overlap and repetition. The funneling approach also seeks to ensure that a holistic perspective of the available themes and categories are presented (Tables 2 and 3). The final themes/categories were the 4 rings of the RToP, the protective and risk factors affecting each ring and those aspects affecting more than 1 ring. The contents of each theme/category are presented in tables to help with analysis of the data and because they are often poorly described.

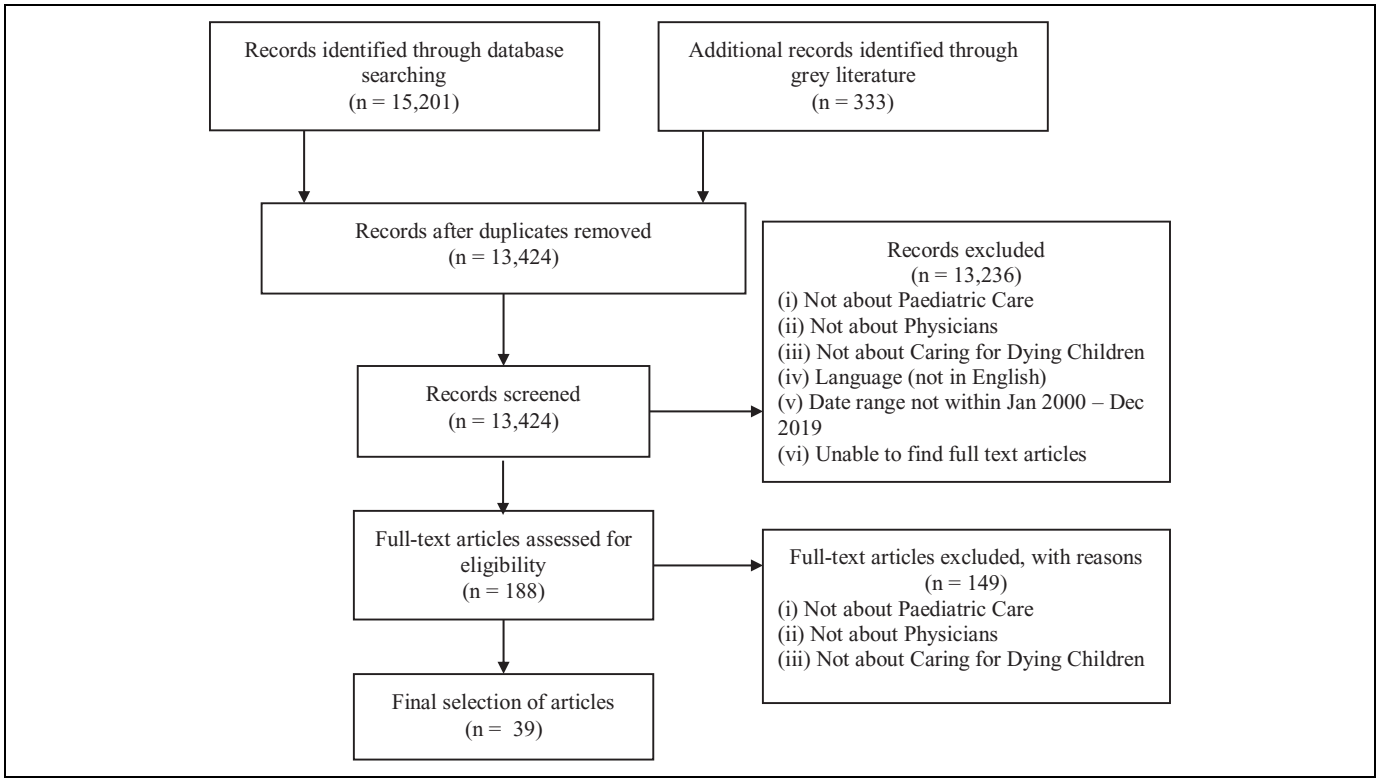

Figure 4. PRISMA flowchart.

Stage 4 of SEBA: Reiterative Process

As part of the reiterative process, the findings of all stages of the SEBA are discussed with members of the expert team and stakeholders who reported general agreement with the findings of this review.

Stage 5 of SEBA: Discussion

Acknowledging that these results will require a re-evaluation of the way physicians in the field are trained, assessed and supported, this SSR will provide a number of material considerations to these deliberations.

To begin, Hobfoll's argument that "resource loss is disproportionally more salient than resource gain"[49] clearly resonates with our findings. Indeed, while caring for the young and terminally ill may bring with it positive effects such as the cultivation of a more compassionate attitude, enhanced job satisfaction and a chance to hone their psychosocial and interpersonal skills, the detrimental effects are far more jarring. The findings reveal that a physician's moral,[90,91] existential,[79] emotional[78,82,92-94] and psychological[80] state may be negatively affected with repercussions on their thinking,[84,89,95,96] decision making,[82,97,98] behavior,[93,99] spiritual ties,[100,79] professional roles[78,97] and personal relationships.[85,101,102] Data also suggests a physical element to these experiences.[82,97,103]

These detrimental effects notably differ in their magnitudes. On one extreme, complex and concurrent negative effects on the various rings may see physicians experience burn-out,[80,82-86] disempowerment/helplessness,[89,93,99] desensitization to death,[89] and or suffer Acute Stress Disorder (ASD) or Post Traumatic Stress Disorders (PTSD).[87-89] Such far-reaching and enduring consequences have been found to undermine their self-confidence,[78,97] perceived levels of competence[104] and skills,[79,102,103] and may even cause them to question the meaning of their lives.[95] With pervasive symptoms and long lasting ramifications upon the individual as reported in the Diagnostic and Statistical Manual of Mental Disorders or DSM-5 (Appendix C), it is easy to see how caring for the young and terminally ill may bring about deeply distressing experiences that cripple their sense of self and self-worth.

Conversely, however, some experiences may be more easily confronted by the physician and may potentially come to pass without extensive interventions and lasting negative effects on their personhood. As such, the magnitude of such effects may be categorized as either "profound" or "limited." However, both require attention as it is unclear if repeated "limited" effects may ultimately result in "profound" effects or if the former may do so if it escalates and spirals in severity.[49]

While these multifarious effects clearly resonate with prevailing thanatological notions of bereavement and grief[114-116] in particular with "limited" and "profound" effects paralleling normal and pathological categorizations—it would be prudent to note that these responses are not solely associated with the loss or death of their young patients. An inconducive work environment, inadequate experience and feelings of

Table 2. Effects on the RToP Rings.

Negative effects on the rings	Positive effect on the rings
Innate Ring • Physicians struggle to rationalize harsh realities of their patient's situation with their religious beliefs[79] • Changes in spiritual views over time, such as less belief in the afterlife[100] • Having less meaning in life[95] • Desensitization to death[89]	
Individual Ring • Burn-out[80-86] • Emotional distress[78,82,92-94] • Moral distress[90,91] • Strong feelings of guilt[88,100] • Disempowerment/helplessness[89,93,99] • Anxiety[79] • Insomnia[103] • Acute Stress Reaction (ASR) or Post • Traumatic Stress Disorder (PTSD)[87-89] • Repetitive dreams[79] • Psychological distress[80], • Subjective personality changes[93] • Physical exhaustion/fatigue[82,97,103], ageing[93], increased endocrine responses[104] • Difficulty empathizing with others[78,79] • Difficulty playing their role in the family setting[78] • Feeling inadequate on the job and were unsure of how to dispose of their duties[78,97] • Uncertain and uncomfortable with the work and expectations of the job[78] • Unsure about their moral responsibility as a member of the team[78] • Difficult decision making[79,102,103] • Anxiety over the possibility of making mistakes[103] • Work conflicts with nurses and superiors[78] • Frustration with job[102] • Leaving their job[81]	Individual Ring • Greater compassion[82] • Greater satisfaction[82,97,98] • Greater appreciation of life[95] • Feelings of personal growth and accomplishment[84,89,95,96] • Higher professional self-esteem[95] • Perceived personal development and professional growth[96]
Relational Ring • Difficulty empathizing with others[78,79] • Difficulty playing their role in the family setting[78] • Marital problems[85,101,102] • Lower quality of their private lives[85,101,102]	Relational Ring • Chance to reflect on their psychosocial and interpersonal skills[98]
Societal Ring • Unsure of roles and responsibilities[78]. • Impacts teamwork and interactions with other HCPs[78]. • Questions role in pediatrics[102].	Societal Ring • Higher professional self-esteem[95], • Enhanced job satisfaction[93,99]. • Desire to remain in their line of work[93], • Validate decision to doing pediatrics[85]

underappreciation may also serve as catalysts which threaten the personhood of these physicians. As such, perhaps it would be remiss to narrowly identify these experiences as grief responses although they are certainly critical to consider.

In tandem, significant variability in the magnitude and rippling of these effects suggests that there are other factors influencing change within the RToP. Two such considerations are the influence of protective and risk factors as outlined in Table 3. Echoing Hobfoll's sub-definition of resources as "objects, personal characteristics, conditions, or energies that act as conduits to the achievement or protection of valued resources,"[49] these protective factors are critical in buffering the rings against incoming threats. Risk factors, on the other hand, weaken the rings and their integrity. As such, it may be posited that these protective and risk factors add a further dimension to the prevailing ring structure of personhood resulting in the re-evaluation of how the RToP is conceived. To accommodate this, the rings within the RToP (Figure 5) may be better understood by depicting them as spheres. Visualizing the rings as spheres offer a number of enhancements as to how personhood may be conceived.

Spheres of the RToP

In delineating the spheres of the RToP in Figure 6, its height is indicated by the number of elements it contains (y-axis), its width the importance accorded to these specific elements (x-axis) and its depth the presence and quality of protective and risk factors which determine the strength of its buffers (z-axis).

The ramifications of negative experiences on these spheres bear greater detailing. If a physician encounters a traumatic loss

Table 3. Risk and Protective Factors Against Negative Experiences.

Risk factors	Protective factors
Innate Ring • Demographics: ■Female physicians[79,80,82,85,89,105] with their own children were more likely to find it difficult to treat children with cancer[79] • Intrinsic personality and beliefs: ■Physicians who identify with their patients[79,99] ■Physicians who emotionally involved in their patient's progress[79,99]	Innate Ring • Demographics: ■Male physicians[96] • Intrinsic personality and beliefs: ■Positive mental states[96,103] ■Sociable[96,103] ■Enthusiastic[96,103] ■Emotionally stable[96,103] ■A strong sense of self[81,96,103] ■Satisfied with life[81,96,103] ■As challenges and motivations to find better clinical solutions[103] ■Feel as though peers view them as successful[81]
Individual Ring • Poor coping mechanisms: ■Failure to identify burnout[85] ■Little self-care[82,106] ■Lack of coping skills[105] ■Use of emotional withdrawal as defense mechanism[82,107] ■Bottling up their distress[81,82,107] ■Perceive poor overall quality of life when compared to their colleagues[101] • Difficulty dealing with clinical uncertainty ■Uncertain prognosis[78] ■Refusing therapy[108] • Difficulty addressing moral/ethical issues ■Offer therapy in the face of high likelihood of poor outcome[108] ■Proposing de-escalation of treatment[90] ■Managing patients with potentially futile treatment[90,102,109,110] ■Proposing de-escalation of treatment[90] • Communication difficulties: ■Informing infants or adolescents of their disease[78,96,111] ■Meetings with parents of children with cancer[96,111] ■Provision of bereavement care for patient's family[105] ■Discussion of autopsy[109] ■Communication issues ○ with colleagues[82,110] ○ within care team itself[92,110]	Individual Ring • Good coping mechanisms: ■Participated in a wide range of different physical activities and hobbies[80,81,103] ■Prayer or meditation[106]
Relational Ring • Poor Coping Mechanisms: ■Physicians who were experiencing poor personal support[85,101,102] ■Feel as though their work is not appreciated[81]	Relational Ring • Social support: ■Family[103] ■Close friends[103] ■Colleagues[99,106]
Societal Ring • Work competency: ■New physicians with little work experience[89,91,92,105], especially if they are intensivists[86] • Work environment and resources: ■"Unconducive" work environments[82,112,106], ■Reliance upon Electronic Health Records (EHR)[113] ■A lack of appropriate care resources to provide best care for patients[111] ■Lack of psychological health services/support available to staff[85,89,102] ■Lack of prior training on coping with work[111] ■Required to publish for financial incentives[81] • Scheduling and human resource allocation: ■Long working hours[85,97] ■Direct clinical care[85] ■Poor control over work schedule[85] ■Administrative work[106] ■Insufficient time to discuss difficult cases with colleagues[98,102]	Societal Ring • Professional competency: ■Job satisfaction[81,85,97,98] ■Being in control at work[85] ■Has work experience[102] • Patient outcome: ■Achieving good clinical outcomes in patients (e.g. symptom-free, complete cure)[89,93,103] ■Ensuring a "good" death[95,112] • Physician-Patient relationship: ■Having a good relationship with patients and/or patient's family[89,93,96,99,103] ■A "close and special" relationship with patient[93,103] ■Giving and receiving support from the patient's family[99] ■Good communications during the caring process[109] • Organizational factors at the workplace: ■Employed at an academic medical center[96] ■Having research and teaching roles in conjunction with clinical duties[103] ■Supportive atmosphere[97]

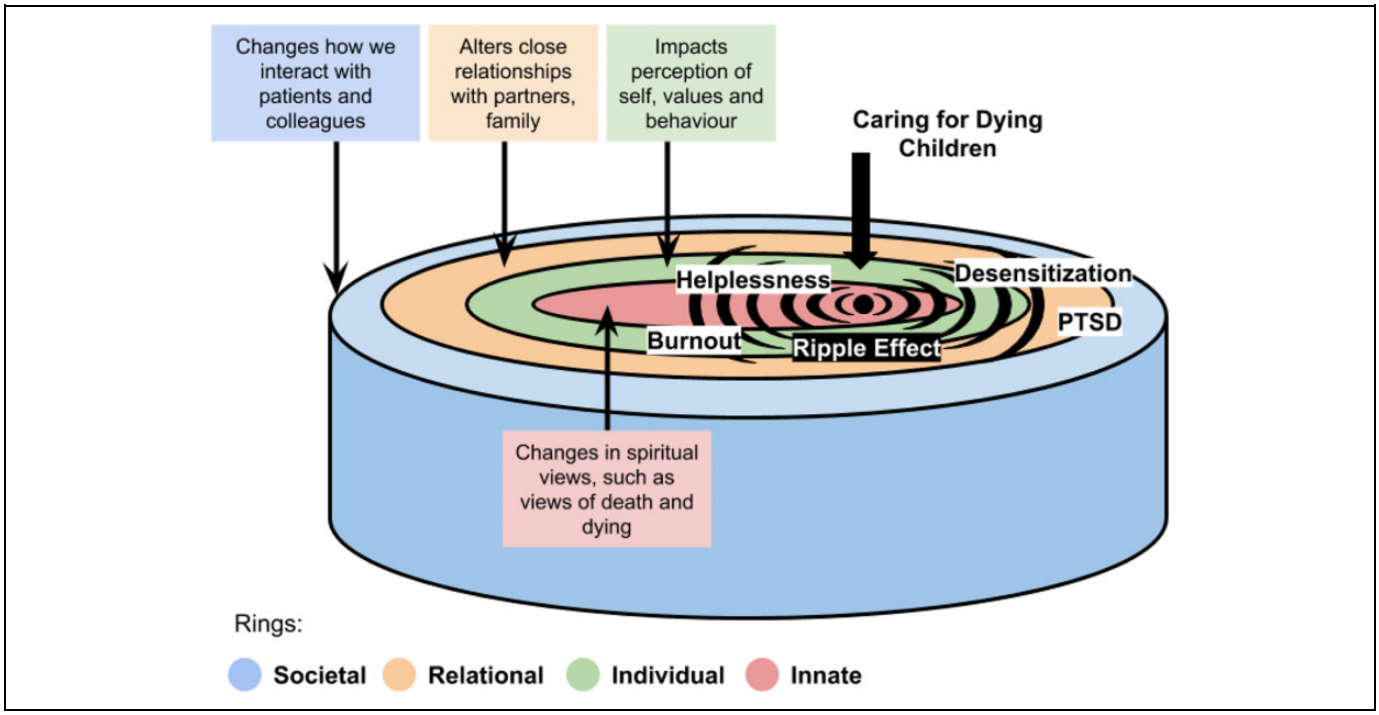

Figure 5. Ripple effect as a result of caring for dying children.

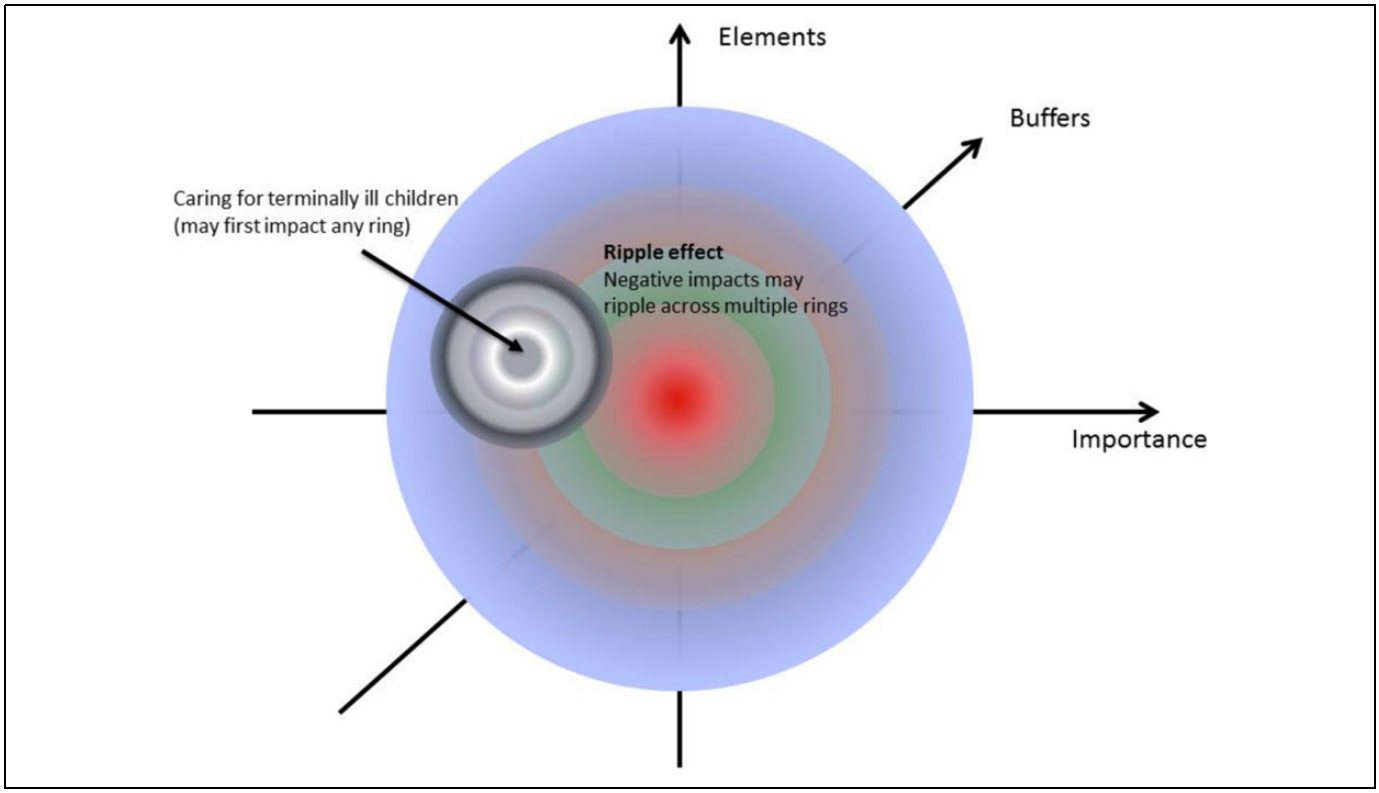

Figure 6. Sphere model of RtoP.

of a terminally ill child, their ties with the Divine may be deeply shaken. The presence of other risk factors such as prevailing doubts confounding their spiritual faith may amplify distress and result in a "profound" effect on their personhood. This may see the "demotion" of their religious beliefs in their level of importance and thus a reduction in the overall size of the Innate Ring/sphere. The presence and quality of risk factors thus introduces the notion of "fragility," the propensity for any negative experience to be exaggerated and which weakens the integrity of the sphere.

Conversely, protective factors such as strong religious affiliations, consistent engagement with religious leaders or texts, and frank conversations with fellow healthcare professionals may attenuate these concerns and instead precipitate a "limited" impact that may be more swiftly addressed. The presence and quality of protective factors thus introduces the notion of "resilience" which helps to buffer against negative experiences and sustain the integrity of the sphere. Such "fragility" and "resilience" explains the dynamic and responsive changes in size that these spheres may undergo.

Protecting Physicians

Healthcare institutions have an ethical duty to protect their physicians within the confines of practical, financial and professional parameters to ensure that physicians are well supported and that their mental health is not compromised as they carry out their professional activities.[117-119] This would also then translate to better patient care.[120]

Firth-Cozens[120] describes how healthcare institutions may implement both preventive and reactive measures to ameliorate stress at both the organizational and physician level. Although only "limited" effects were considered, the interventions proposed may be further adapted and remain pertinent for consideration. To begin, healthcare institutions should ideally streamline workflow structures and processes to allow for the nurturing of trusting and enduring relationships between colleagues.[121] Serving as mutual support systems on the premises, open sharing of difficult experiences would allow for professional and personal advice-taking and reprieve. Greater job satisfaction may also be experienced through formal recognitions—such as through awards, recommendation letters, fair remunerations and career advancement opportunities for physicians.[121] In addition, healthcare institutions should provide protected time and rotations out of the intensive care unit to allow physicians the necessary space to pursue hobbies and build strong connections with friends and family outside of work.[122] Ensuring opportunities for cultivating a healthy work-life balance is key to empowering physicians and preserving their self-concepts and identity in the face of constant death and distress.

Furthermore, opportunities for learning and reflecting on how death may be better handled could be made available through mortality rounds.[123,124] These rounds would allow for recognition and discussion of difficult cases in a safe environment, the provision of interprofessional group support as well as early identification of at-risk physicians. Helplines and counseling services formally provided by trained in-house medical social workers and informally by senior consultants should also be made accessible. In tandem, multidisciplinary meetings, debriefs and grief training workshops sponsored by external institutions and conducted by specialists in psychiatry or psychology should be regularly organized.[125,126] These sessions should educate physicians on complex grief dynamics, on how death talks could be better conducted with patient and offer opportunities for reflective writing, verbalization and self-attunement to their personal and professional needs. The extended use of portfolios will also certainly guide and facilitate the professional identity formation of junior doctors as they navigate through the tremulous experience of caring for the young and terminally ill.

Evidence of the diverse long-term ramifications of the more insidious "profound" effects and the possible cumulative potential of smaller "limited" impacts, underline the need for a tool that will help identify physicians at-risk or in distress. This will allow the provision of personalized, longitudinal, holistic, accessible and timely support for these physicians. The tool should ideally evaluate their present coping abilities, guide their training as well as ensure the establishment of fair working conditions,[82,112,106] clinical oversight[79,102,103] and psychological,[85,89,102] administrative and personnel support.[120] To this end, drawing from prevailing knowledge of the key RToP features and the list of protective and risks factors featured in Table 3, we proffer a means of identifying physicians at risk when caring for terminally ill children and areas of higher risk in institutes (Table 4).

It is recommended that such a tool is used longitudinally to firstly high areas of risk, secondly, physicians at risk and lastly if interventions have been successful. If many physicians were to attribute high scores to specific items identified under "risk factors," these areas should be distinguished as risk areas for physicians within the particular healthcare institute. Institutes should then make concerted efforts to focus on and resolve these issues. Physicians who attribute high scores to multiple items identified under "risk factors" should be considered as more susceptible to experiencing "profound" effects on their personhood. Institutes should then ensure that individual counseling sessions are swiftly provided. To better understand the degree to which physicians are presently supported and to discern if support measures in place effectively result in measurable benefits to physicians, institutes should focus on items identified under "protective factors" and determine if these items are scored higher over time after the implementation of support measures. It is hoped that such a tool will provide insight into the way forward for healthcare institutes in supporting physicians caring for terminally ill children.

Limitations

Although the search process was vetted and overseen by the expert team, use of specific search terms and inclusion of only

Table 4. Preliminary Framework of a tool to Assess Resilience,

Please rate each item from 0-10, with 0 being not significant and/or relevant to your life, and 10 being significant and/or relevant to your life.				
Innate Ring				
Demographics				
Elements of ring	Risk factors	Score	Protective factors	Score
Gender	Female		Male	
Children	Has children			
Personality and Beliefs				
Elements of Ring	Risk Factors	Score	Protective Factors	Score
Personal Traits			Positive mental status	
			Sociable	
			Enthusiastic	
			Emotional stability	
			Strong sense of self	
			Satisfied with life	
Professional Traits	Identifies with patient		Sees challenges as motivations to find better clinical solutions	
	Emotionally involved in patients' progress		Feel as though peers view them as successful	
Religious Beliefs				
Ethnicity				
Genetic				
Individual Ring				
Coping Mechanisms				
Elements of Ring	Risk Factors	Score	Protective Factors	Score
Responses to Emotional Distress	Unable to identify burnout		Engage in physical activities	
	Little self-care		Engage in hobbies	
	Lack of coping skills		Engage in prayer or meditation	
	Emotionally withdraw to cope			
	"Bottles up" negative emotions			
	Perceive oneself as having a poor quality of life compared to colleagues			
Clinical Experiences				
Elements of Ring	Risk Factors	Score	Protective Factors	Score
Values, beliefs	Faced with clinical uncertainty (e.g. uncertain prognosis, patients refusing therapy)			
	Faced with moral/ethical issues (e.g. managing patients with potentially futile treatment, proposing de-escalation of treatment)			
	Having difficulties communicating with patients			
Communication	Having difficulties communicating with colleagues			
Relational Ring				
Relationships with Others				
Elements of Ring	Risk Factors	Score	Protective Factors	Score
With Family	Lack close ties		Strong ties	
With Close Friends	Lack close ties		Strong ties	
With Colleagues	Lack close ties		Strong ties	
Others	Feel as though work is not appreciated			
Societal Ring				
Professional Competency				
Elements of Ring	Risk Factors	Score	Protective Factors	Score
Work Experience	Have little work experience		Has work experience	
Responsibilities	Have to publish for financial incentives		Have research roles	
	Have to handle administrative work		Have teaching roles	

(continued)

Table 4. (continued)

Please rate each item from 0-10, with 0 being not significant and/or relevant to your life, and 10 being significant and/or relevant to your life.		
Work environment	Unconducive atmosphere Poor control over work schedule Reliant on electronic health records Lack appropriate care resources to provide best care for patients Lack psychological health services/support from host institute Lack of prior training on coping with work	Supportive atmosphere
Patient Outcomes		Able to achieve good clinical outcomes (symptom free, complete cure or "good death")
Physician-Patient Relationship		Have a good relationship with patients and/or their family Gives and receives support from patient's family Good communication with patient and/or their family

English language articles potentiates the possibility of key publications being omitted. In addition, while independent and concurrent use of thematic and content analysis by the team of researchers improved its trustworthiness through enhanced triangulation and transparency, biases cannot be entirely eradicated.

Use of the RToP in this context is also novel and the data captured in this SSR suggests that its use as a "tool" to identify critical issues with physicians' concepts of personhood still possesses limitations. Although the RToP provides a "snapshot" of these prevailing concepts, the funneling process evidences the need for further studies to be conducted as to how personhood may evolve in both ordinary and extraordinary circumstances, and how physicians may address and cope with these diverse situational considerations.

Conclusion

This systematic scoping review has revealed new and pertinent insights into personhood that bear due consideration in the way physicians caring for the young and dying may be better trained, assessed and supported. The foregrounding of protective and risk factors and the magnitude of their impact on the physician's individual rings of personhood lend insight into how some may culminate in "profound" effects that cripple self-confidence, perceptions of competence and require extensive intervention, or "limited" impacts that may be addressed through the existing presence of protective factors or which may escalate and maladaptively manifest as "profound" effects. While the rings' entwined nature may lead to ripple effects where tensions reverberate across rings, leading to far-reaching ethical, moral, existential, psychoemotional and or relational distress, their intertwined nature also affords the rings mutual protection and bolstering. Careful consideration of protective and risk factors associated with each ring and their magnitude has thus seen the evolution of the ring structure into spheres which account for their dynamic influence on the physician's development of "resilience" or "fragility." This reinvigorated model has led to the preliminary design of a personalized assessment tool to evaluate physicians' coping and serving as a means of identifying those at-risk.

While the Ring Theory of Personhood serves as a durable and cohesive framework by which assessments tools may glean insight, it is evident that further studies focused on the assessment of risk factors and prospective evaluations of changes in personhood are required in the curation of longitudinal, holistic, accessible and timely support for clinicians caring for terminally ill children. Clarity in the provision of clinical oversight, psychological, administrative and personnel support and a nurturing work environment would better equip healthcare institutions in the guidance and support of physicians in this precarious field.

Appendix

Appendix A

PubMed Search Strategy

("Physicians/psychology"[Mesh] OR Doctor[tiab] OR Doctors[tiab] OR intensivist[tiab] OR intensivists[tiab] OR resident[tiab] OR residents[tiab] OR physician*[tiab] OR Pediatrician*[tiab] OR Paediatrician*[tiab] OR Neonatologist*[tiab]) AND (("Terminally Ill"[Mesh] OR "Critical Illness"[Mesh] OR "clinical Deterioration"[Mesh] OR "Death"[Mesh] OR "Life Support Care"[Mesh] OR "Critical Care"[Mesh] OR "Terminal Care" [Mesh] OR "Palliative Care"[Mesh] OR Dying [tiab] OR terminal illness*[tiab] OR critical Illness*[tiab] OR intensive care*[tiab] OR life threatening[tiab] OR palliative[tiab] OR end of life[tiab] OR end-of-life[tiab] OR ICU[tiab] OR Intensive Care[tiab]) AND ("Pediatrics"[Mesh] OR "Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh] OR neonate*[tiab] OR paediatric*[tiab] OR teenage*[tiab] OR youth[tiab] OR children[tiab]))

Appendix B

Table B1. List of included articles in this study

Author, year	Study location[+]	Method of study	Topic of focus*	Summary of abstract
Shenoi, 2017	USA	Questionnaire (MBI, General Health Questionnaire)	Positive impacts and Protective factors Coping Mechanisms	Burnout is high among pediatric critical care physicians in the United States. About two thirds of the physicians with severe burnout met the screening criteria for psychological distress that suggests possible common mental disorders. Significant percentages of physicians experiencing burnout and considering to leave the profession has major implications for the critical care workforce.
Weintraub, 2016	USA	Questionnaire (Modified Compassion Fatigue and Satisfaction Self-Test)	Positive impacts and Protective factors Coping Mechanisms Interventions	Compassion fatigue and burnout may impact emotional well-being and professional performance of neonatologists. Enhancement of CS is a potential target for intervention.
Hollingsworth, 2018	UK	Survey	Interventions	Pediatric trainees are at risk of developing acute stress reactions and PTSD following the death of a child. The feeling of guilt should be identified and acknowledged to allow prompt signposting to further support, including psychological assessment or intervention if required.
Fogaca, 2010	Brazil	Questionnaire (WHO QOL 100)	Positive impacts and Protective factors	The Quality of Life assessment of physicians and nurses working in pediatric and neonatal intensive care units was below the scores found in scientific literature, compared to studies that evaluated patients with chronic pain and mental health disorders, indicating the occurrence of occupational stress.
Larson, 2017	Canada	Questionnaire (Revised Moral Distress Scale, MBI)		Moral distress is present in PICU and neonatal ICU health practitioners and is correlated with burnout, uncertainty, and feeling unsupported.
Papadatou, 2002	Greece	Interview	Positive impacts and Protective factors Coping Mechanisms	Health professionals' grieving process was affected by how they perceived their role, interventions, and contribution in the care of the dying child, which in turn was influenced by the social and cultural context in which care is provided to children with cancer. Findings suggest that despite the distress caused by children's death, both nurses and physicians identified specific rewards they reaped from caring for children who are terminally ill.
Tawfk, 2017	USA	Questionnaire (MBI)	Interventions	Burnout is most prevalent in NICUs with high patient volume and electronic health records and may affect nurses disproportionately. Interventions to reduce burnout prevalence may be of greater importance in NICUs with equal to or more than 10 weekly admissions.
De Boer, 2016	The Netherlands	Survey, Questionnaire (Moral Distress scale-revised pediatric version MDS-R)	Interventions	Although infrequently perceived, overtreatment of patients caused considerable distress in nurses and physicians. Our unit introduced multidisciplinary medical ethical decision making 5 years ago, which may partly explain the low MD at baseline.
Fischer, 2000	Switzerland	Prospective Cohort study		Stress-related cortisol surges occur frequently in neonatal and pediatric critical care staff. Cortisol increases are independent of subjective stress perception. Professional experience does not abate the endocrine stress reactivity.
Fanos, 2007	USA	Interview	Positive impacts and Protective factors Coping Mechanisms Interventions	Most (57%) had experienced serious illnesses during their own childhood or adolescence; 77% had experienced significant medical events in their parents or siblings prior to adulthood. Pediatric oncologists need help mastering their own healing so they can be helpful to patients and families.

(continued)

Table B1. (continued)

Author, year	Study location[+]	Method of study	Topic of focus*	Summary of abstract
Profit, 2014	USA	Survey, Questionnaire (MBI, Safety Attitudes Questionnaire)		Burnout varied significantly between NICUs, but was less prevalent in physicians compared with non-physicians. NICUs with more burnout had lower teamwork climate, safety climate, job satisfaction, perceptions of management and working conditions.NICU caregiver burnout appears to have "climate-like" features, is prevalent, and associated with lower perceptions of patient safety culture.
Serwint, 2006	USA	Survey	Coping Mechanisms Interventions	By midresidency, these pediatric residents have had many personal and professional experiences with death. Residency training programs must provide venues for residents to address bereavement, facilitate the integration of these experiences, and provide time to attend funerals.
Lee, 2008	USA	Interview	Positive impacts and Protective factors Interventions	The major themes of staff members experiences were (1) importance of communication, (2) accommodating the wishes of others despite personal preferences, (3) ambiguity about the use of technology, (4) sadness, and (5) emotional support. Descriptions of moral distress were seen infrequently. Many welcomed the sadness they experienced as a sign of their humanity and emotional availability, but did not feel adequately supported in dealing with their grief. Conclusions The experience of caring for a child who dies in the PICU is multifaceted. Grief, rather than moral distress, was the dominant psychological response of caregivers. Future research could focus on enhancing communication and emotional support.
Wolfe, 2017	USA	Survey, Questionnaire (MBI, Centre for Epidemiologic Studies Depression Screen)	Positive impacts and Protective factors	Compared to the beginning, at the end of the PICU rotation there is a significantly higher prevalence of depression, emotional exhaustion, and depersonalization among pediatric residents. Pediatric residents may have a more favorable PICU experience if they feel involved in procedural aspects of patient care, are allowed more autonomy in decision making, and there is a continued focus on resident education and team-based care.
Granek, 2016	Canada	Interview	Coping Mechanisms Interventions	Pediatric oncologists used engagement coping strategies with primary and secondary responses including emotional regulation (social support and religion), problem solving (supporting families at end of life), cognitive restructuring (making a difference and research), and distraction (breaks, physical activity, hobbies and entertainment, spending time with own children). They also used disengagement coping strategies that included voluntary avoidance (compartmentalization and withdrawing from families at end of life).
Granek, 2015	Canada	Interview	Interventions	Fellows reported structural challenges that included ward duty and lack of follow-up opportunities with bereaved families. Personal challenges included feelings of vulnerability as a result of being a trainee, inexperience with patient death, and feeling alone with one's reactions to patient death. Relational challenges included duration of relationships with families and with supervising staff and perceived lack of modeling on how to cope with patient deaths.
Wocial, 2017	USA	Questionnaire (MDS-R, Moral Distress Thermometer Score)	Interventions	"Clinical situations" represented the most frequent contributing factor to moral distress. Post intervention, overall moral distress scores, measured on the moral distress scale revised (MDS-R), were lower for respondents in all categories (non-significant), and on 3 specific items (significant). The addition of a clinical ethicist and senior intensivist to weekly inter-professional team meetings facilitated difficult conversations regarding realistic goals of care. The study demonstrated that the PEACE intervention had a positive impact on some factors that contribute to moral distress and can shorten PICU length of stay for some patients.

(continued)

Table B1. (continued)

Author, year	Study location[+]	Method of study	Topic of focus*	Summary of abstract
Fogaca, 2010	Brazil	Questionnaire (Effort-Reward Imbalance ERI)		Statistically significant differences were not found among physicians or nurses from PED and NEO in relation to E and R. No statistically significant differences were found between physicians and nurses in PED in the several studied variables. Comparison between the professionals working in NEO revealed that physicians presented more over-commitment than nurses. The organizational setting of NEO proved to be more demanding for physicians, exacting a greater commitment to their work, while demands presented in both units seemed to be the same for nurses.
Roth, 2011	USA, Canada, and 11 other countries around the world	Questionnaire (MBI)	Positive impacts and Protective factors Coping Mechanisms Interventions	Approximately three quarters of pediatric oncologists experience burnout. Physicians who reported satisfaction with their lives outside of work were less likely to have burnout. The availability of a forum for debriefing, and services for physicians affected by burnout were both associated with lower rates of burnout
Stenmarker, 2009	Sweden	Questionnaire (LoL, HP5i, POCQ, SCL-90)	Positive impacts and Protective factors Coping Mechanisms	Pediatric oncologists face life-threatening conditions and psychosocial issues factors that may negatively influence their life satisfaction. This study group, a single population of physicians, is characterized by an optimistic attitude and stable emotional status pointing to a high level of satisfaction, which is probably a main basic condition when meeting seriously ill children
Stenmarker, 2010	Sweden	Interview	Positive impacts and Protective factors Coping Mechanisms Interventions	A core category, that is, their main concern, labeled being a messenger of life-threatening conditions, was identified. To manage this difficult tasks of acting like a messenger breaking bad news, 5 handling categories were used: obtaining knowledge and information, saving one's strength and resources, building a close relationship, avoiding identification, and dealing with one's attitude to central life issues. All the categories and strategies used are described.
Weigl, 2015	Germany	Questionnaire (MBI, ERI)	Positive impacts and Protective factors Interventions	Results demonstrate close relationships between increased work stress and burnout as well as diminished quality of care. High work stress environments in pediatric care influence mental health of pediatricians as well as quality of patient care.
Setou, 2013	Japan	Questionnaire	Coping Mechanisms Interventions	The primary factors related to psychological distress were found to be the following 4 items: "gender," "years of experience," "acquisition of coping method," and "feelings of helplessness." In the high distress group, most pediatricians were women, lacked experience, had no coping methods, and felt helplessness.
Taubman-Ben-Ari, 2008	Israel	Questionnaire (Purpose of Life Test, Posttraumatic Growth Inventory, Secondary Trauma Scale and Life Orientation Test)	Positive impacts and Protective factors	The findings indicate that a higher level of exposure to patient death, higher optimism, and professional self-esteem, and lower secondary traumatization predicted the sense of meaning in life, whereas occupation, as well as higher professional self-esteem and higher level of secondary traumatization, especially among lower professional self-esteem individuals, predicted a higher experience of personal growth. In addition, nurses reported higher levels of professional self-esteem, secondary traumatization, and personal growth than physicians. The theoretical and practical implications of the results are discussed.
Boss, 2015	USA	Questionnaire (Jefferson Scale of Physician Empathy JSPE)	Coping Mechanisms Interventions	Trainees experienced conflicts with families and conflicts with other clinicians. Trainees also described multiple conflicts of identity as members of the neonatology team, as members of the medical profession, as members of their own families, and as members of society. Physician trainees experience significant conflict and distress while learning to care for critically ill and dying infants. These conflicts often led them to question their own morals and their role in the medical profession. Physician trainees should be educated to expect various types of distress during intensive care rotations, encouraged to identify their own sources of distress, and supported in mitigating their effects.

(continued)

Table B1. (continued)

Author, year	Study location[+]	Method of study	Topic of focus*	Summary of abstract
Kirsch, 2017	USA and Netherlands	Interview	Coping Mechanisms Interventions	Key issues discussed included patient's best interests, physician obligations, moral distress, and communication in the context of decisions about providing therapy for patients with a poor prognosis.
Crowe, 2017	USA	Interview	Positive impacts and Protective factors Interventions	Doctors and nurses who work in PICUs often deal with emotionally difficult events. These events take a toll. They can cause long-term psychological problems that, if not addressed, can impair the ability of doctors and nurses to care for patients in a competent and compassionate manner. Furthermore, effective treatment is available. But there is a paradox. To get treatment, one must acknowledge the problem. Acknowledgment of the problem may not be encouraged, or may be discouraged and stigmatized, in the intensive care culture. This article describes a case in which a physician has classic signs of overwhelming grief and burnout and it discusses the appropriate response.
Klein, 2017	Switzerland	Questionnaire (MBI)	Positive impacts and Protective factors Coping Mechanisms Interventions	The aspects of work most commonly identified as sources of distress were: lack of regular staff meetings, lack of time for routine discussion of difficult cases, lack of psychological support for the NICU staff and families, and missing transmission of important information within the caregiver team. Differences between physicians' and nurses' perceptions became apparent: for example, nurses were more dissatisfied with the quality of the decision-making process. Different perceptions were also noted between staff in the German- and French-speaking parts of Switzerland: for example, respondents from the French part rated lack of regular staff meetings as being more problematic. On the other hand, personnel in the French part were more satisfied with their accomplishments in the job. On average, low levels of burnout symptoms were revealed, and only 6% of respondents answered that the work-related burden often affected their private life.
Duncan, 2017	USA	Questionnaire (MBI)	Coping Mechanisms Interventions	Debriefing, the most commonly offered support, was available to about half (55.8%) of the sample; yet, nearly all respondents (98.3%) indicated that debriefing would be useful. On average, bereavement and emotional exhaustion levels were comparable to normative data, but patterns of coping varied based on participants' position within the transplant team. For participants who reported that debriefing was available at their institutions, emotional exhaustion was lower.
Garcia, 2014	South Brazil	Questionnaire (MBI)	Positive impacts and Protective factors	Burnout is frequent among pediatric intensivists and characterized by cumulative involvement of emotional exhaustion, depersonalization, and professional accomplishment. Earlier recognition of emotional exhaustion may be important in preventing the development of a complete burnout syndrome. Improvement in workplace characteristics and measures to improve physician resilience are entirely warranted
Twohig, 2016	Ireland	Questionnaire	Interventions	Respondents identified parents' emotional experiences such as "anxiety," "shock," "loss of control," and "lack of feelings of competence as parents" as highly prevalent. Infant cues of "responding to parent's voice" and "quieting-alerting" were ranked most highly; "crying" and "physiological changes" were ranked lowest. Preterm infant medical risk, maternal emotional state, and mental health are perceived to impact most highly on the developing relationship, as compared with infant state or behavior and socioeconomic factors.

(continued)

Table B1. (continued)

Author, year	Study location[+]	Method of study	Topic of focus*	Summary of abstract
Kpassagou, 2017	Togo (Africa)	Interview	Coping Mechanisms Interventions	We found that practitioners experienced significant emotional distress. Their emotional distress was compounded by the seriousness of the illnesses they treated, the lack of appropriate medical equipment, and treatment failures that caused their patients to suffer. The health practitioners' narratives suggested that a key reason for their emotional distress was a mismatch between their professional training and the realities of providing care in a resource-constrained setting. They also reported not receiving any training on how to cope with the emotional stresses associated with care and preventable patient deaths.
Epstein, 2008	USA	Interview	Positive impacts and Protective factors	Providers described their experiences largely through an overall theme of "creating the best possible experience" for parents. To support this theme, 3 subthemes (building relationships, preparing for the EOL and creating memories) were common between physicians and nurses. However, nurses and physicians articulated their roles and obligations differently within these subthemes. Additionally, 3 subthemes through which the providers described their personal experiences were found and these included moral distress, parental readiness and consent for autopsy.
Kase, 2019	USA	Questionnaire (Compassion Fatigue and Satisfaction Self-Test for Helpers CFST)	Positive impacts and Protective factors	Distress about a "clinical situation," physical exhaustion, and personal loss were identified as significant determinants of CF. Distress about "coworkers," emotional depletion, social isolation, and "recent involvement in a clinical situation in which life-prolonging activities were not introduced" were significant determinants of BO. Physical exhaustion, personal history of trauma, "recent involvement in a clinical situation in which life-prolonging activities were not introduced," and not discussing distressing issues were significant predictors of lower CS scores.
Gribben, 2019	USA	Questionnaire (Compassion Fatigue and Satisfaction Self-Test for Helpers CFST)	Positive impacts and Protective factors	Burnout score, emotional depletion, and distress about a patient and/or the physical work environment were each significant determinants of higher Compassion Fatigue scores. Chronic exposure to distress in patients and families puts pediatric critical care physicians at risk for compassion fatigue and low compassion satisfaction.
Ffrench, 2019	USA	Questionnaire (Texas Revised Intentory of Grief, Impact of Event Scale, BriefCOPE tool)	Positive impacts and Protective factors Coping Mechanisms	Qualitative analysis revealed prominent themes of sadness, helplessness, guilt, shock, and concern for the bereaved family. There was limited use of coping strategies. Speaking with another trainee doctor was the principal coping strategy. Requests for debriefing sessions, greater psychological support and follow-up with the patient's family were frequently suggested.

*All articles included mentioned negative impacts and risk factors. [+]North America 58.3%, Europe and UK 25%, others 19.4%

Appendix C

Table C1. Long-term Impacts on Physicians with Reference to DSM-5 and other resources

Impact	Symptoms/Manifestations	Duration	References
Desensitization to Death, Burn-out, Strong Feelings of Guilt, Disempowerment/ Helplessness	• Depersonalization • Emotional distance from work • Intention to leave healthcare institute • Emotional exhaustion • "Can become a burden in personal life"[127] • Long term absenteeism	"Chronic", long term, "accumulation of so many experiences over so many years" and may be observed as part of longitudinal studies[89,93,128-130]	[80,82-86,88,89,93,99,100,127-131]
Anxiety	For Generalized Anxiety Disorder: • Excessive anxiety and worry (apprehensive expectation) occurring more days than not for at least 6 months, about a number of events or activities (such as work or school performance). • The person finds it difficult to control the worry. • The anxiety and worry are associated with 3 or more of the following 6 symptoms (with at least some symptoms present for more days than not for the past 6 months). ○ Restlessness or feeling keyed up or on edge ○ Being easily fatigued ○ Difficulty concentrating or mind going blank ○ Irritability ○ Muscle tension ○ Sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep) • The focus of the anxiety and worry is not confined to features of an Axis I disorder (e.g., the anxiety or worry is not about having a panic attack [as in panic disorder], being embarrassed in public [as in social phobia], being contaminated [as in obsessive-compulsive disorder] being away from home or close relatives [as in separation anxiety disorder], gaining weight [as in anorexia Nervosa], or having a serious illness [as in hypochondriasis]), and the anxiety and worry do not occur exclusively during posttraumatic stress disorder. • The disturbance is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition (e.g., hyperthyroidism). • The disturbance is not better explained by another mental disorder (e.g., anxiety or worry about having panic attacks in panic disorder, negative evaluation in social anxiety disorder [social phobia], contamination or other obsessions in obsessive-compulsive disorder, separation from attachment figures in separation anxiety disorder, reminders of traumatic events in posttraumatic stress disorder, gaining weight in anorexia nervosa, physical complaints in somatic symptom disorder, perceived appearance flaws in body dysmorphic disorder, having a serious illness in illness anxiety disorder, or the content of delusional beliefs in schizophrenia or delusional disorder).	more days than not for at least 6 months	[132]

(continued)

Table C1. (continued)

Impact	Symptoms/Manifestations	Duration	References
Insomnia	• A predominant complaint of dissatisfaction with sleep quantity or quality, associated with one (or more) of the following symptoms: ○ Difficulty initiating sleep. (In children, this may manifest as difficulty initiating sleep without caregiver intervention.) ○ Difficulty maintaining sleep, characterized by frequent awakenings or problems returning to sleep after awakenings. (In children, this may manifest as difficulty returning to sleep without caregiver intervention.) ○ Early-morning awakening with inability to return to sleep. • Sleep disturbance causes clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning • Sleep difficulty occurs at least 3 nights per week • Sleep difficulty occurs despite adequate opportunity for sleep • Insomnia is not better explained by and does not occur exclusively during the course of another sleep-wake disorder • Insomnia not attributable to the physiological effects of a substance • Coexisting mental disorders and medical conditions do not adequately explain the predominant complaint of insomnia	Present for at least 3 months	[132]
PTSD	Symptom Categories of: • Exposure to traumatic event • Intrusion • Avoidance • Negative alterations in cognition and mood • Alterations in arousal and reactivity • Duration of symptoms is >1 month • Symptoms cause significant distress or functional impairment • Symptoms not due to alcohol, drugs or medication	>1 month in some patients, and while there might be "immediate onset of some symptoms" some patients will only progress to full PTSD after repeated exposure to trigger.	[133]

Abbreviations

PPC	Pediatric Palliative Care
COVID-19	Coronavirus Disease 2019
HCP	Healthcare Professionals
RToP	Ring Theory of Personhood
SEBA	Systematic Evidenced Based Approach
SSR	Systematic Scoping Review
PICOS	Population, Intervention, Comparison, Outcome, Study Design
ASR	Acute Stress Reaction
PTSD	Post Traumatic Stress Disorder
ASD	Acute Stress Disorder

Authors' Note

PRISMA Checklist.doc with completed PRISMA Checklist. All data generated or analyzed during this study are included in this published article and its supplementary information files. LXLN, YTO, JXN, JTYK, JLC, NPXC, CYH, ABHMA, NHAK, CWSC, CHN, XHT, LHET, AMCC, SM, MRJ, MC, LKRK were involved in data curation, formal analysis, investigation, preparing the original draft of the manuscript as well as reviewing and editing the manuscript. All authors have read and approved the manuscript.

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