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Predictors of Secondary Traumatic Stress (STS) and Burnout in Paediatric Nurses

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ABSTRACT

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Health and social care professionals at are risk of developing symptoms of trauma as a result of supporting traumatised individuals. This is termed secondary traumatic stress (STS; Figley, 1995). This paper reviews the predictors of STS in health and social care professionals followed by a study of the predictors of STS and burnout in paediatric nurses specifically. The literature review aimed to obtain an overview of the main risk and protective factors associated with STS. A systematic search of the literature was carried out, 68 studies met the inclusion criteria and a narrative synthesis was then conducted. The most consistent evidence suggested that increased empathy predicted STS whilst social support appeared protective. Current life stress was also associated with STS but the evidence was limited by methodological issues. Tentative evidence was found for the role of coping styles and compassion satisfaction, whilst evidence for exposure to work-related trauma, a personal trauma history and emotional detachment was inconclusive. These are discussed in relation to clinical implications and directions for future research.

The majority of research regarding predictors of STS and burnout has taken place in professionals working with adult populations and there is a lack of research regarding paediatric nurses specifically. The empirical study's purpose was therefore to identify the predictors of these conditions in this specialist group and to clarify whether paediatric nurses working in high-mortality risk departments

were at greater risk. A cross-sectional survey was conducted and 84 members of nursing staff participated. Emotional empathy and current life stress significantly predicted STS, whilst both predicted burnout in addition to a lack of support and behavioural disengagement. No differences in STS or burnout levels were found between departments. Clinical implications are discussed and it is concluded that hospitals would benefit from implementing additional training to support their staff.

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Author's declaration

I, Kathryn Davies declare that the thesis entitled, Predictors of Secondary Traumatic Stress (STS) and Burnout in Paediatric Nurses and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research.

I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University
- where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- none of this work has been published before submission.

Signed: ……..

Date:…….

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Predictors of Secondary Traumatic Stress (STS) in Health and Social Care Professionals

Since the introduction of Post Traumatic Stress Disorder (PTSD) into the Diagnostic and Statistical Manual III (DSM-III; American Psychiatric Association [APA], 1980), much of the trauma literature has focused on the traumatised individual. However there has been a growing recognition that health and social care professionals who provide support to such individuals are also at risk of developing trauma symptoms themselves. This is termed secondary traumatic stress (STS), which is defined as "the natural, consequent behaviours and emotions resulting from knowledge about a traumatising event experienced by a significant other. It is the stress resulting from helping... a traumatised or suffering person" (Figley, 1995, p. 10). STS can develop quickly and without warning and the symptoms mirror PTSD, including re-experiencing, avoidance and hyper-arousal (Figley, 1995; see following sections for further details regarding symptomology and development). STS affects not only the professional but has implications for the organisation and the clients they support. For example, STS is associated with intention to leave the profession (Bride, Jones, & MacMaster, 2007), absenteeism and poor patient satisfaction (Boyle, 2011). Identifying the predictors of STS is therefore particularly important if organisations are to prevent staff from developing this condition and support those who do.

Symptoms of STS

Consistent with PTSD, there are three main categories of psychological symptoms associated with STS. These include, re-experiencing the traumatised person's event; avoidance of reminders related to the person or event or numbing in response to reminders; and hyper-arousal (Figley, 1995). Re-experiencing includes, recollections of the traumatised person or the event; dreaming about them; suddenly re-experiencing the person or event; and experiencing distressing reminders of them. Avoidance includes, efforts to avoid thoughts, feelings and events associated with the person; psychogenic amnesia; diminished interest in activities; detachment from others; and a sense of foreshortened future. Hyper-arousal includes, difficulties falling or staying asleep; irritability or anger;

difficulties concentrating; hyper-vigilance for the traumatised person; exaggerated startle response; and physiological reactivity to cues (Figley, 1995).

Additional symptoms comprise physical complaints including, somatic complaints such as headaches; addictive or compulsive behaviours; and impaired functioning in social and personal roles (Dutton & Rubinstein, 1995). Symptoms are summarised in table 1.

Table 1.

Summary of symptoms of STS

Cognitive	Emotional	Physical	Behavioural
Re-experiencing	Anxiety	Headaches	Agitation
Difficulties	Anger	Nausea/vomiting	Avoidance
concentrating	Sadness	Chest tightness	Withdrawal
Poor problem-solving	Fear	Chills	Absenteeism
Poor decision-making	Embarrassment	Rapid heart rate	Job changes
Pessimism	Frustration	Dizziness	Exaggerated startle
Distrust	Hopelessness/	Fatigue	response
Negative self	despair	Weakness	Addictive/compulsive
appraisals	Loss of control	Numbness	behaviours
Forgetfulness	Over-excitability	Sleep problems	Hyper-vigilance

(Dutton & Rubinstein, 1995; Figley, 1995; Gates & Gillespie, 2008; Morrissette, 2004)

Development of STS

Figley (1995) initially proposed a model for the development of STS, however he suggested that many professionals seem uncomfortable with the term STS and so he chose to use the term compassion fatigue (CF) in his model of compassion stress and fatigue (see figure 1). Whilst some authors now argue that the two concepts are slightly different (see the following section), the model was conceived at a time when they were considered synonymous. Consequently, much of the literature investigating predictors of STS draws on the model's factors, which are summarised below.

Figley (1995; 2002) proposed that empathy and exposure to those experiencing trauma are central to developing STS. He suggested that the empathy required in helping traumatised clients requires emotional energy, which can lead to compassion stress (residual emotional energy). Combined with other factors such as prolonged exposure to traumatised clients, life disruptions, and traumatic recollections (including memories of traumatised clients and personal traumatic experiences), the residual compassion stress can develop into STS. The ability to disengage from clients and a sense of job satisfaction are suggested to reduce the likelihood of STS developing.

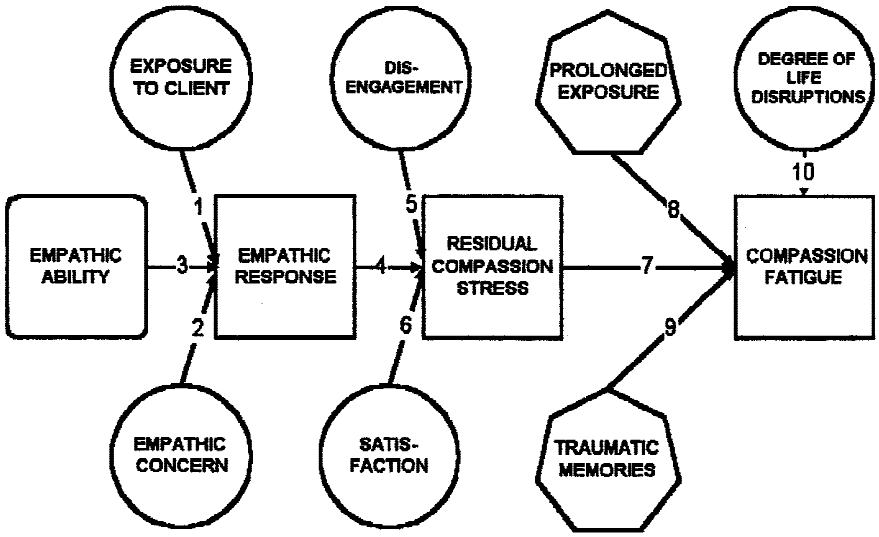

Figure 1. Compassion Stress and Fatigue Model (Figley, 1995; 2002).

The model therefore identifies a range of factors associated with secondary trauma and forms the basis upon which further research regarding STS was conducted.

Related concepts

Compassion fatigue (CF).

As stated above, Figley (1995) suggested that STS can be used interchangeably with the term CF. This was originally coined by Joinson (1992) to describe nurses who were burning out due to their work in emergency departments and Figley considered it to be a more acceptable term to clinicians. More recently some researchers have proposed that the terms describe slightly different constructs, suggesting CF is the combined effects of STS and burnout (Adams, Boscarino, & Figley, 2006; Stamm, 2010). However, a plethora of authors continue to use the

two concepts synonymously. Furthermore, the CF scale of one of the most well used measures, the Compassion Satisfaction/Fatigue Self-Test (CSFT; Figley & Stamm, 1996), was renamed the STS subscale when the measure was subsequently revised (Stamm, 2005). Consequently, prior to this revision, it is not wholly clear which concept was being measured. This makes the two concepts difficult to separate, increasing the difficulty of interpreting research independently of each other (Najjar, Davis, Beck-Coon, & Doebbeling, 2009). Therefore, whilst the focus of this review is STS, research which uses the term CF will also be included as in practice, it is usually STS which is being measured.

Burnout.

STS is also related to burnout, which is a similar concept but has subtle differences. Burnout develops gradually over time and is considered to be an occupation-related defensive response to prolonged exposure to demanding situations which involve psychological strain and inadequate support (Jenkins & Baird, 2002). It is characterized by decreased personal accomplishment, emotional exhaustion and depersonalization (Maslach, 1982) and is not specific to those working with traumatised populations. As a review of workplace affect suggests, burnout tends to relate to organisational factors such as administration, supervision, and workload (Brief & Weiss, 2002) rather than the content of one's clinical work.

Vicarious trauma (VT).

VT is specific to those working with traumatised populations and like STS, it results from the empathic engagement with clients. In contrast to STS, VT is based on constructivist self-development theory (McCann & Pearlmann, 1990; Pearlmann & Saakvitne, 1995) and is characterised by permanent changes to professionals' cognitions. This results in significant disruption to their sense of meaning, identity, world view and beliefs about the self and others (Pearlmann & Saakvitne, 1995). Thus whilst similar constructs, VT focuses upon professionals' beliefs and meaning making whilst STS focuses upon symptoms which mimic PTSD.

STS in health and social care professionals

STS is prevalent in a range of health and social care professionals such as child protection workers (Conrad & Kellar-Guenther, 2006); social workers (Bride et al., 2007), mental health professionals (Sprang, Clark, & Whitt-Woosley, 2007); oncology nurses (Quinal, Harford, & Rutledge, 2009); and paediatric healthcare providers (Robins, Meltzer, & Zelikovsky, 2009). Prevalence rates range considerably with studies indicating that between 22% and 78% of professionals report moderate to high levels of STS (Abendroth & Flannery, 2006; Beck & Gable, 2012; Conrad & Kellar-Guenther, 2006; Ortlepp & Friedman, 2002).

Reviews of STS in mental health and social care professionals have identified a range of factors which are related to its development. In particular, exposure to work-related trauma, particularly time spent with traumatised clients, and a personal history of trauma have been associated with STS (Baird & Kracen, 2006; Bride, 2004). More limited evidence was also found for the protective effects of coping (Baird & Kracen, 2006; Bride, 2004) and social support (Bride, 2004). Notably Baird and Kracen (2006) conducted a research synthesis of STS and VT and attempted to reduce bias by including unpublished dissertations and synthesising the data using a levels of evidence method (Miller & Thoresen, 2003), adding weight to their conclusions. However, a more recent review concluded there was no evidence for a dose-response model regarding exposure to trauma and suggested that results regarding the relationship between personal trauma history and STS were inconsistent (Elwood, Mott, Lohr, & Galovski, 2011). The discrepancies in findings may relate to the more recent date of the latter review as the STS literature has expanded over recent years. However, it may also relate to their inclusion of studies investigating VT, which may have confounded the results.

Existing reviews therefore offer little consensus as to the main predictors of STS and are limited by several issues. Firstly, they did not use a systematic search and secondly, some failed to consider STS and VT separately which confuses their conclusions given they are separate constructs. Thirdly, they restricted their search to social care and mental health professionals and no review has included research regarding medical health professionals such as nurses or physicians. This might be because STS research has tended to focus on the former professionals as they are

traditionally perceived to support traumatised individuals. However there is a growing recognition that medical health professionals are also exposed to trauma, such as the death of a patient (Robins et al., 2009) and research has expanded considerably in this area in recent years. Therefore, given the mixed conclusions emerging from previous reviews, it seems timely to reconsider the literature, focusing on STS specifically and taking medical health professions into account, which may help clarify the inconsistencies.

The purpose of this review was therefore to identify research related to factors which are associated with, or predict STS, in health and social care professionals, including medical health professionals, with the aim of gaining an overview of the main risk and protective factors.

Search strategy

A systemic search of the literature was completed using Psychinfo, Web of Knowledge and Medline. The following terms were searched (secondary traumatic stress OR secondary trauma* OR vicarious trauma* OR compassion fatigue) AND (nurs* OR doctor OR physician OR medic OR clinician OR surgeon OR paramedic* OR therapist OR mental health OR social work* OR child protection work* OR child welfare OR psycholog* OR counsel* OR anaesthes* OR speech and language therap* OR occupational therap* OR physiotherp* OR dietician OR oncolog* OR dentist* OR midwife* OR midwives OR hospice OR palliative care OR health and social care professional OR health professional OR health provider OR hospital worker OR hospital staff OR health care worker).

All empirical studies which related to predictors of STS, secondary traumatization or CF and health and social care professionals were included. Research regarding VT was checked to ensure it did not refer to STS (as the terms are occasionally used interchangeably) and then excluded. Research relating to untrained staff such as students and support workers; and non-health and social care staff such as the police and military staff was also excluded. Further excluded were articles which did not include predictors or correlates of STS, intervention studies, unpublished theses, and non-empirical articles. There were 1318 initial returns, 1094 were excluded after reading the abstract leaving 224 studies which were potentially

relevant. The full text was obtained for these and a further 160 were subsequently excluded, leaving 68 studies which met the inclusion criteria (see appendix 1 for the search process).

Data extraction

The 68 studies were reviewed for information which was relevant to the aims and consistent with the inclusion criteria. Extracted data included publication data, sample size and characteristics, study design, main outcome measures and the main findings (see appendix 2).

Synthesis

Studies' results were synthesised by grouping risk or protective factors into conceptually similar categories. The prominence of each factor was then evaluated via a consideration of the number of studies finding significant associations and consideration of the quality of the studies' methodologies. Discrepancies were also identified and gaps in the literature were highlighted.

Results

Overview

Most studies were quantitative (N=53) with a minority using mixed method designs (N=8) or qualitative methods (N=6). All studies had fewer male participants than females. 29 studies had samples consisting of professionals from medical health, 19 from social care, and 20 from mental health. Most sample sizes were between 50 and 500 (N=53) although four studies had over 500 participants. All but one study utilised cross-sectional designs and the majority used correlational or regression analyses.

The studies included a range of factors associated with STS, most of which were included in Figley's (1995; 2002) model. These comprised empathy, exposure to trauma, personal trauma history, life stress, compassion satisfaction (CS) and emotional detachment. However social support, coping styles and demographic factors were also frequently investigated. These are discussed in the sections below and it is noted that there is little consensus regarding several factors. Consideration is also given to which professions are most at risk and a summary of uncommonly examined factors is included.

Empathy

Empathy is a multidimensional concept which incorporates the ability to recognise and understand another's perspective, and the emotional response one has to another's emotions. Consequently, it is has both a cognitive and an emotional element (Davis, 1983) and is considered essential to the helping relationship and working effectively with traumatised individuals (Figley, 1995; Sabo, 2006). Figley (2002) suggests this requires a combination of sensing others' pain (empathic ability), motivation to respond to this pain (empathic concern) and the ability to put oneself in the client's position to gain insight into their cognitive and affective state (empathic response). This process combines cognitive and emotional empathy and allows the professional to better understand the client and consequently work with them more effectively. However, it also opens the professional up to experiencing the negative effects of trauma.

Six quantitative studies and four qualitative studies have explored empathy and STS. The majority of studies sampled professionals from medical health, including nursing and genetic counselors, however two studies included hospital social workers and one focused on therapists. The majority of quantitative studies found a positive association between empathy and STS (Abendroth & Flannery, 2006; Crumpei & Dafinoiu, 2012; MacRitchie & Leibowitz, 2010; Robins et al., 2009) and the use of regression over bivariate correlations adds weight to their results, suggesting empathy remains significant in the presence of other predictors. However two studies found no association (Badger, Royse, & Craig, 2008; Simon, Pryce, Roff, & Klemmack, 2005). This discrepancy may relate to the professions sampled as both the studies which found no association utilised hospital social workers, whereas studies which found a positive association sampled medical health professionals such as nurses. It is likely that the latter professionals spend more time with patients than hospital social workers suggesting exposure levels may influence the relationship between empathy and STS. However, the discrepancies may also relate to methodological issues in the refuting studies. These included a lack of standardised empathy measures or incorrect usage of standardized measures, whereby emotional and cognitive subscales were combined into an overall empathy score against recommendations (Davis, 1983).

Only two studies investigated the effects of emotional versus cognitive empathy and both indicated that emotional empathy was more commonly associated with STS (Crumpei & Dafinoiu, 2012; Robins et al., 2009). Discrepant results were found for the role of cognitive empathy. Robins et al.'s (2009) results indicated that low cognitive empathy predicted STS and high cognitive empathy predicted compassion satisfaction (which is suggested to buffer the effects of STS [Stamm, 2010]), but these results were not replicated by Crumpei and Dafinoiu (2012). However based on Robins et al.'s larger sample size and use of regression rather than bivariate correlations, their results appear to carry more weight.

Qualitative studies also supported the role of empathy and whilst they cannot identify the extent to which one variable influences another, they can provide richer information and help explore areas of confusion highlighted by quantitative studies. The findings of the four studies reviewed suggested that over-empathising

or emotionally investing in clients emerged as common themes for professionals who described symptoms of STS (Benoit, Veach, & LeRoy, 2007; Maytum, Heiman, & Garwick, 2004; Perry, Toffner, Merrick, & Dalton, 2011; Udipi, Veach, Kao, & LeRoy, 2008). Interestingly, some studies suggested that increased emotional involvement in patients' experiences evoked memories of difficult personal situations which exacerbated their STS symptoms (Benoit et al., 2007; Udipi et al., 2008). This indicates that emotional empathy may make professionals with a history of trauma increasingly vulnerable, which may explain why some quantitative studies have not found significant results. However, the qualitative results should be taken cautiously as participants were self-reporting STS and given its close links to concepts such as burnout and VT, it is difficult to say with confidence whether they were reliably reporting STS. Furthermore, two studies (Benoit et al., 2007; Udipi et al., 2008) aimed to test the applicability of Figley's (2002) model to genetic counselors and whilst deductive research is a valid approach, it does not readily allow for alternative themes to emerge.

Overall, there is fairly consistent evidence for the link between empathy and STS, although qualitative studies cannot identify the extent to which variables affect each other. Unfortunately, few studies have focused on the different empathic styles, but emerging evidence suggests emotional empathy may be particularly predictive, warranting further research.

Exposure to work-related trauma

Exposure to the traumatic experiences of others is considered fundamental to the development of STS (Figley, 1995). Unfortunately, measuring exposure to such trauma is fraught with complexities, with studies using different ways to operationalise it (Elwood et al., 2011). For example, some studies use length of experience, whilst others use the proportion of traumatised individuals on one's caseload or the time spent working with clients per week. However these do not necessarily equate to exposure to trauma. For example, over 20 years a professional's contact time with traumatised individuals may vary depending on their working hours or their progression to a supervisory or managerial role, which may reduce direct contact with clients. Consequently, precisely measuring

exposure to trauma becomes difficult. These aspects are each discussed below in detail.

Length of experience.

27 quantitative studies measured exposure to work-related trauma in terms of length of experience. Six found that fewer years experience was associated with STS (Badger et al., 2008; Frank & Adkinson, 2007; Injeyan et al., 2011; Nelson-Gardell & Harris, 2003; Sprang et al., 2007; Von Rueden et al., 2010). Whilst this seems counter intuitive, distressed professionals may leave the field prematurely whilst those who remain may develop more effective coping strategies as they become more experienced (Elwood et al., 2011; Nelson-Gardell & Harris, 2003). However the remaining 21 studies found no significant relationship (Adams et al., 2006; Adams, Figley, & Boscarino, 2008; Alkema, Linton, & Davies, 2008; Boscarino, Figley, & Adams, 2004; Bride et al., 2007; Choi, 2011; Creamer & Liddle, 2005; Czaja, Moss, & Mealer, 2012; Deighton, Gurris, & Traue, 2007; Dominguez-Gomez & Rutledge, 2009; Ghahramanlou & Brodbeck, 2000; Hooper, Craig, Janvrin, Wetsel, & Reimels, 2010; Horwitz, 2006; Lyndall & Bicknell, 2001; Mizuno, Kinefuchi, Kimura, & Tsuda, 2013; Ortlepp & Friedman, 2002; Perron & Hiltz, 2006; Potter et al., 2010; Racanelli, 2005; Simon et al., 2005; Townsend & Campbell, 2009). On the strength of these numbers and the lack of other methodological or statistical issues which might explain the discrepancy in results, it seems most appropriate to conclude that years experience is not a major risk factor for STS.

Caseload.

13 quantitative studies measured exposure to trauma in terms of the proportion of trauma clients per caseload. The evidence was mixed, with five studies finding a positive association between exposure and STS (Bride et al., 2007; Buchanan, Anderson, Uhlemann, & Horwitz, 2006; Craig & Sprang, 2010; Sprang et al., 2007; Townsend & Campbell, 2009), whilst eight found no relationship (Baird & Jenkins, 2003; Boscarino et al., 2004; Devilly, Wright, & Varker, 2009; Follette, Polusny, & Milbeck, 1994; MacRitchie & Leibowitz, 2010; Patrick Meadors, Lamson, Swanson, White, & Sira, 2009; Ortlepp & Friedman, 2002; Von Rueden

et al., 2010). Scrutiny of the methodology and statistical analysis, including sample type and size, did not suggest any clear reasons for the discrepancy in results. However it may relate to conceptualising exposure to trauma in terms of the proportion of traumatised clients per caseload. For example, it is possible that whilst clients may have experienced traumatic events, this may not be the focus during sessions and so professionals may not actually be exposed to as much trauma in practice as their caseload would suggest (Elwood et al., 2011).

Number of clients seen per week/month.

A variation on the above method was to measure the number of traumatised clients seen over a specific time period. Seven studies used this method and similar to caseload, four studies found a positive association (Deighton et al., 2007; Mizuno et al., 2013; Severn, Searchfield, & Huggard, 2012; Udipi et al., 2008) whilst three did not (Cohen, Gagin, & Peled-Avram, 2006; Perron & Hiltz, 2006; Simon et al., 2005). But again, this method is subject to the same problems whereby the time spent with clients may not be focused on the traumatic event.

Alternative methods.

In a departure from the mainstream methods of measuring exposure to trauma, a small number of studies used participant ratings of the frequency or distress associated with profession-specific traumatic events and both were found to significantly predict STS (Komachi, Kamibeppu, Nishi, & Matsuoka, 2012; Udipi et al., 2008). Whilst such studies are limited in number, the results are promising and indicate that measuring the frequency and severity of the work-related trauma warrants further research.

Qualitative methods.

Given the inconsistent quantitative results, qualitative studies were scrutinised to provide a further understanding of exposure to work-related trauma. Six studies identified themes related to triggers for STS. All of them indicated that professionals reported trauma symptoms following traumatic work-related events such as watching painful medical procedures, delivering bad news, or a patient death (Beck & Gable, 2012; Benoit et al., 2007; Maytum et al., 2004; Pulido, 2012;

Udipi et al., 2008; Yoder, 2010). Furthermore, several studies indicated that certain profession-specific events were considered more emotive (Beck & Gable, 2012; Benoit et al., 2007; Udipi et al., 2008). This suggests exposure to traumatic events of a particular type or severity might increase vulnerability to STS rather than broad exposure per se, supporting some of the quantitative findings described above (Komachi et al., 2012; Udipi et al., 2008).

There is therefore little evidence for an association between length of experience and STS and the inconsistent results using caseload or number of clients make it difficult to draw conclusions. Nevertheless, as Elwood et al. (2011) conclude, there does not currently appear to be sufficient evidence to suggest a dose-response model. However, qualitative research consistently suggests STS is linked with traumatic work-related events and it is possible that quantitative studies are inconsistent due to the current methods of measuring exposure to trauma, which do not appear to adequately capture this concept. This indicates further research is needed utilising more direct measurements of exposure, such as the frequency or severity of profession-specific traumatic events.

Personal history of trauma

A personal trauma history is also suggested to increase professionals' vulnerability to STS (Figley, 1995). It is postulated that exposure to patients' traumatic experiences can trigger professionals' own traumatic recollections (Pearlmann & Saakvitne, 1995), however mixed results have been found in the literature. 20 studies have investigated the relationship between personal trauma history and STS, and all but two were quantitative. 10 studies reported a significant, positive association (Bride et al., 2007; Buchanan et al., 2006; Choi, 2011; Deighton et al., 2007; Ghahramanlou & Brodbeck, 2000; Jenkins & Baird, 2002; Killian, 2008; MacRitchie & Leibowitz, 2010; Nelson-Gardell & Harris, 2003; Tosone, McTighe, Bauwens, & Naturale, 2011), whilst eight studies found no such relationship (Adams et al., 2006; Adams et al., 2008; Boscarino et al., 2004; Creamer & Liddle, 2005; Devilly et al., 2009; Follette et al., 1994; Ortlepp & Friedman, 2002; Rossi et al., 2012).

The reasons for the discrepancy in the results is not immediately clear, particularly as all 18 quantitative studies used a variety of standardized and non-standardised measures and included a range of samples and sizes, with no obvious deficits in either the supporting or refuting research. However, possible explanations may include, the nature of the trauma history, the level of distress associated with it, and the role of other more proximal factors. These are discussed in turn.

Regarding the nature of the trauma, it is possible that some studies failed to find a significant relationship because the historical events were too dissimilar to the work-related traumatic events, hence the traumatic memories were not triggered (Creamer & Liddle, 2005). There is some support for this with three studies which measured similar traumatic personal events and work-related events all reporting significant results (Jenkins & Baird, 2002: MacRitchie & Leibowitz, 2010; Nelson-Gardnell & Harris, 2003). However Follette et al. (1994) also measured similar personal and work-related trauma and found no association. Nevertheless, this hypothesis might merit further investigation as no research has directly compared the effects of trauma histories which are similar or dissimilar to the work-related trauma.

It is also possible that the *distress* caused by a professional's personal trauma may affect the development of STS, rather than the presence of trauma history in itself. For example, some studies found that receiving therapy or taking medication as a result of one's trauma history was associated with higher STS (Creamer & Liddle, 2005; Ghahramanlou & Brodbeck, 2000). Similarly, qualitative studies suggest professionals who have resolved their personal trauma report less STS (Bell, 2003; Bourassa, 2012). However, studies which utilised measures which assess the impact of traumatic events have not found significant results (Devilly et al., 2009; Ortlepp & Freidman, 2002). Consequently, the level of distress does not seem to satisfactorily explain the discrepancies.

With regard to the role of proximal factors, the studies were also scrutinised in terms of their analysis, which provided the most fruitful explanation for the inconsistent findings. The majority of studies used regression analyses and it became apparent that most studies which had failed to find a significant

relationship between trauma history and STS had also accounted for more proximal factors, which did significantly predict STS. For example, several studies found that recent negative life events were predictive of STS whilst trauma history was not (Adams et al., 2006; Follette et al., 1994; Rossi et al., 2012). It therefore seems possible that whilst a history of personal trauma may increase professionals' vulnerability to STS, in the presence of more proximal factors, it becomes less important.

Overall, whilst the results for the role of personal trauma history appear inconsistent, there is some evidence to suggest that whilst it is associated with increased STS, it becomes less predictive in the face of more proximal factors such as current life stress. However there is also a possibility that the similarity of the personal trauma and work-related trauma may have an effect on STS and this merits further investigation.

Current life stress

Figley (1995) proposed that life stressors, such as illness, normally cause a tolerable level of distress but when combined with the other factors discussed, they can 'tip the balance' and increase vulnerability to developing STS.

12 studies have investigated this, eight of which were quantitative, however the quality of the studies was not optimal with very few studies using standardised measures of life stress. Indeed, most studies relied on a count of negative life events and failed to consider participants' appraisals of stressors, which is important in determining whether someone has a stress response (Lazarus & Folkman, 1984). Nevertheless, the majority of studies found life stress was positively associated with STS (Abendroth & Flannery, 2006; Adams et al., 2006; Bonach & Heckert, 2012; Czaja et al., 2012; Follette et al., 1994; Meadors & Lamson, 2008; Rossi et al., 2012), although two studies failed to find a relationship (Adams et al., 2008; Bride et al., 2007). The reasons for this discrepancy may relate to the brief, non-standardised measures of stress used by the latter two studies, suggesting their results should be taken cautiously.

The studies which found a significant association varied in their conceptualisation of life stress, with some measuring overall negative life events over the past 6-12 months (Adams et al., 2006; Follette et al., 1994; Meadors & lamson, 2008; Rossi et al., 2012), whilst others measured specific events such as a significant loss or financial difficulties (Abendroth & Flannery, 2006; Bonach & Heckert, 2012). This suggests that stress from both cumulative recent life events and from specific stressors may increase vulnerability to STS. Few studies reported the time scale in which life events were measured and so it is unclear how proximal stressors need to be to have an effect. However the longest time period reported where a significant relationship was found was 12 months (Rossi et al., 2012).

Notably however, whilst the majority of studies used regression, which represents an advance on correlational analyses, they are still cross-sectional and so causality cannot be established. Consequently, whilst some life stressors such as bereavement, are unlikely to be the result of STS, it could contribute to stressors such as relationship difficulties. This is illustrated by qualitative research which indicated that STS symptoms negatively affected professionals' personal lives, such as experiencing difficulties providing emotional support to friends (Austin, Goble, Leier, & Byrne, 2009; Benoit et al., 2007; Udipi et al., 2008). Although one study suggested life stressors exacerbate STS (Perry et al., 2011). It therefore seems that whilst life stressors may make professionals' more vulnerable to STS, it can also impact negatively on their personal lives.

Consequently, there are relatively few studies investigating the role of current life stress, and fewer still which have used standardised measures. Nevertheless, the majority of research indicates that life stress may increase professionals' vulnerability to STS. However, it is possible that the relationship between the two variables could be reciprocal and longitudinal research, utilising more robust measures, is necessary to explore this further.

Compassion satisfaction

CS is the satisfaction gained from the helping process and is suggested to be protective against STS. (Figley, 2002; Stamm, 2010). Whilst only six quantitative

studies have investigated this, they consistently found a weak to moderate negative correlation between compassion satisfaction and STS with r= -.20 to -.44, across a range of professions (Alkema et al., 2008; Conrad & Kellar-Guenther, 2006; Simon et al., 2005; Slocum-Gori, Hemsworth, Chan, Carson, & Kazanjian, 2013; Van Hook & Rothenberg, 2009; Yoder, 2010). Furthermore, quantitative research is also supportive (Bourassa, 2012). The evidence therefore suggests that those with high CS are less likely to have STS however the studies used simple correlations, preventing causality from being established and did not control for other variables. Consequently, it is unclear whether compassion satisfaction would continue to be protective in the presence of other factors.

Emotional detachment

Professionals' ability to detach from their clients is considered protective (Figley, 1995; 2002) but only two quantitative studies have investigated this and whilst one found low detachment significantly predicted STS (Badger et al., 2008) another found no significant relationship (Simon et al., 2005). However the latter study had only 31 participants hence the results should be interpreted cautiously. Qualitative studies also indicated that professionals utilise detachment strategies (Austin et al., 2009; Benoit et al., 2007; Udipi et al., 2008). However the results suggested that cognitive and affective strategies, such as emotional numbing, appeared to allow professionals to cope in the short-term by avoiding distress but maintained STS long-term. Consequently, there is a lack of clarity as to how predictive or adaptive detachment is and longitudinal research is needed to explore this.

Social support

Whilst social support was not included in Figley's model (1995; 2002), it has subsequently been proposed that other aspects of a professional's environment may influence the development of STS, and social support has been suggested to be a protective factor (Adams et al., 2008). This can either be emotional, informational or instrumental and can include support from co-workers or friends and family. Those with few sources of support, or a lack of satisfaction with support, are

postulated to be more vulnerable to the effects of working with traumatised clients (Adams et al., 2008).

19 studies investigated social support and STS, seven of which were qualitative. Of the 12 quantitative studies, eight reported that a lack of support was positively associated with STS (Bonach & Heckert, 2012; Boscarino et al., 2004; Bride et al., 2007; Devilly et al., 2009; Horwitz, 2006; MacRitchie & Leibowitz, 2010; Ortlepp & Friedman, 2002; Townsend & Campbell, 2009; Von Rueden et al., 2010), although these findings were not consistently replicated (Adams et al., 2008; Badger et al., 2008; Killian, 2008; Komachi et al., 2012). One study also reported that nurses with STS were significantly less likely to seek support from friends than those without (Von Rueden et al., 2010), suggesting a lack of support may be a result of STS rather than a risk factor. This raises an interesting point, but due to the cross-sectional nature of the above studies, causality cannot be identified, which represents a weakness in the social support and STS literature. Additionally, only half of the studies utilised standardised measures of support, suggesting their results should be taken cautiously. Nevertheless, there is some indication that a link exists between social support and STS.

Unfortunately, there was a lack of research which differentiated between the different types of support, such as emotional or instrumental and so it is not possible to identify which types are most helpful. There was also a disappointing degree of attention paid to the effects of different sources of support, with some studies measuring general support whilst others either focused on friends and family or co-workers. Only two studies compared both co-worker support and support from friends and family and the results indicated that a lack of support from friends and family was most predictive (Bonach & Heckert, 2012; Von Rueden et al, 2010). However neither used standardised measures of social support. Furthermore, the results are not supported by the other studies whereby those who failed to find a significant association between support and STS measured general social support or support from friends and family (Adams et al., 2008; Badger et al., 2008; Killian, 2008; Komachi et al., 2012). Conversely, those who did find a significant relationship tended to measure co-worker support (Boscarino et al., 2004; Bride et al., 2007; Horwitz, 2006; Townsend & Campbell, 2009).

Given the mixed evidence described above, qualitative research was scrutinised for sources of support and the majority of studies suggested that co-worker support was most frequently cited as helpful (Beck & Gable, 2012; Benoit et al., 2007; Bourassa, 2012; Killian, 2008; Maytum et al., 2004; Perry et al., 2011; Pulido, 2012). Indeed, support from friends and family has been described as less helpful because they are considered less able to understand what the job role entails and do not have similar experiences from which to draw comparisons (Benoit et al., 2007; Bourassa 2012). Qualitative studies therefore tend to support the utility of co-worker support over support from friends and family.

Consequently, the majority of studies indicate that a lack of support is associated with STS, although the cross-sectional nature of the studies precludes any conclusions about causality being drawn. Furthermore, little research has compared the effects of different sources of support but qualitative research tends to indicate that co-worker support is considered most helpful.

Coping styles

Like social support, coping styles are absent from Figley's (1995; 2002) model however they have received growing attention in the STS literature over recent years. A variety of different coping styles have been identified in the wider literature and are considered to be the cognitive or behavioural ways in which individuals attempt to manage stressors which are exceeding their resources (Lazarus & Folkman, 1984). Coping styles are often categorised as problem-focused or emotion-focused. Problem-focused strategies focus on addressing the source of stress, whereas emotion-focused strategies attempt to manage the distress caused by the stressor (Lazarus & Folkman, 1984). Whilst it is overly simplistic to view the effectiveness of coping strategies as an adaptive versus maladaptive dichotomy, there is some suggestion in the wider literature that problem-focused coping tends to lead to better adjustment (Gurung, 2010).

Eight studies have investigated coping and STS with most utilising samples of medical health professionals and only two studies focusing on mental health

professionals (Bell, 2003; Follette et al., 1994). Of the six quantitative studies, five found coping was related to STS (Follette et al., 1994; Quinal et al., 2009; Udipi et al., 2008; Von Rueden et al., 2010; Yoder, 2010). Only one used a standardised measure of coping (Udipi et al., 2008), whilst the others relied on the perceived helpfulness of idiosyncratic coping strategies, such as the use of relaxation. Consequently, it is difficult to directly compare the results or draw conclusions as to the most effective coping styles. Nonetheless, coping strategies which could broadly be considered emotion-focused, such as substance use or trying to forget information about clients' traumatic experiences, were associated with STS (Follette et al., 1994; Udipi et al., 2008; Von Rueden et al., 2010). This is consistent with the suggestion that emotion-focused coping tends to lead to poorer outcomes (Gurung, 2010). However, further studies indicate that other strategies which could again be broadly categorised as emotion-focused, such as relaxation, engaging in hobbies and prayer, were associated with *low* STS (Beck & Gable, 2012; Quinal et al., 2009; Von Rueden et al., 2010; Yoder, 2010). This suggests some forms of emotion-focused coping are adaptive.

Only one study reported findings related to problem-focused coping (Bell, 2003) however this was qualitative so a direct association cannot been inferred. Moreover, the examples provided seemed to describe emotional detachment rather than problem-focused coping.

Other research has failed to identify a relationship between coping and STS (Robins et al., 2009; Quinal et al., 2009) but this is likely to relate to the inconsistencies in the way coping was measured. For example, whilst Robins et al. (2009) was one of the only studies to use a standardised measure of coping, the items were reduced using factor analysis and Cronbach's alpha indicated that one of the two factors was not reliable, making these results less weighty than they would otherwise have been.

Overall, the quality of research regarding coping is generally poor and limited in numbers, but the available evidence suggests coping is associated with STS. The lack of research and consistent measures prevents clear conclusions being drawn around the most predictive or protective styles, although there is some suggestion

that whilst emotion-focused styles are associated with high STS, some appear adaptive. There is also a dearth of research which has examined the role of problem-focused coping, which requires clarification.

Demographic factors

Age.

Previous reviews have indicated that younger professionals are more vulnerable to STS (Bride, 2004). Possible explanations for this are linked to having fewer years experience, as previously discussed. 18 studies reported results for the relationship between age and STS however the findings were inconsistent. Eight studies found a negative association (Bonach & Heckert, 2012; Dominguez-Gomez & Rutledge, 2009; Ghahramanlou & Brodbeck, 2000; Nelson-Gardell & Harris, 2003; Sprang et al., 2007; Sprang, Craig, & Clark, 2011; Townsend & Campbell, 2009; Van Hook & Rothenberg, 2009), whilst 10 found no such relationship (Adams et al., 2006; Alkema et al., 2008; Baird & Jenkins, 2003; Choi, 2011; Cohen et al., 2006; Lyndall & Bicknell, 2001; Mizuno et al., 2013; Potter et al., 2010; Simon et al., 2005; Von Rueden et al., 2010). The discrepancies in results do not appear to relate to sampling nor statistical issues and so whilst age may have an effect, it appears less important in the presence of other predictors.

Gender.

11 studies reported results regarding gender. Again the results were mixed with five studies finding females were significantly more likely to develop STS than males (Choi, 2011; Hooper et al., 2010; Horwitz, 2006; Rossi et al., 2012; Sprang et al., 2007) whilst five found no gender effects (Adams et al., 2006; Adams et al., 2008; Cohen et al., 2006; Connally, 2012; Von Rueden et al., 2010). This discrepancy may relate to the large proportion of females in the studies' samples, whereby the uneven group sizes may have prevented significant results from being detected. Notably, one study found males were most at risk (Sprang et al., 2011), however a large proportion of males in this study were child welfare workers, which was the only profession to significantly predict STS. This may have biased their results, which are therefore unlikely to be representative.

Consequently, there is some evidence to suggest that demographic factors such as young age and female gender may increase vulnerability to STS however the literature is inconsistent and it seems likely that in the presence of other factors, they may become less influential.

Profession

Given different professions are exposed to different types and levels of trauma, this may affect their vulnerability to STS. Only six studies have directly compared different professions, but the results appear supportive, with five finding significant differences in STS levels (Crumpei & Dafinoiu, 2012; Follette et al., 1994; Shiri, Wexler, Alkalay, Meiner, & Kreitler, 2008; Sprang et al., 2007; Sprang et al., 2011), although Robins et al. (2009) found no such results. Unfortunately the profession types were too heterogeneous to draw any clear conclusions as to which professions are most at risk. However, there was some indication that whilst all professions sampled experienced STS, those with greater exposure to clients' trauma had higher levels. For example, Sprang et al. (2011) found child welfare workers[1] experienced greater STS than behavioural professionals.

Working with children may also increase vulnerability to STS as their traumatic experiences are considered more emotive (Figley, 1995). Only two studies compared child and adult workers and whilst child therapists experienced higher STS than adult therapists (Creamer & Liddle, 2005), these results were not replicated in medical professionals (Robins et al., 2009). The discrepancy may relate to the different professions sampled but it is impossible to draw conclusions with further research.

Miscellaneous factors

Several miscellaneous factors have also been associated with the development of STS. These include, moral distress (Maiden, Georges, & Connelly, 2011); locus of control (Injeyan et al., 2011); specialist training (Ben-Porat & Itzhaky, 2011);

[1] Child welfare workers tend to be involved in on-going and multiple cases of child abuse and neglect (Sprang et al., 2011)

[2] Figley (1995) suggested that many clinicians feel uncomfortable with the term secondary trauma and so chose to use the term compassion fatigue as a more acceptable alternative.

[3] During recruitment, feedback indicated that a number of wards had a large proportion of health

insecure attachment (Tosone, Bettmann, Minami, & Jasperson, 2010; Tosone et al., 2011); and posttraumatic growth (Samios, Rodzik, & Abel, 2012). However with such limited research, it is impossible to draw any conclusions regarding these factors at this time.

Discussion

Key findings and clinical implications

STS is prevalent across a wide range of health and social care professions and a variety of risk factors and protective factors have been identified, although some are limited by insufficient or conflicting evidence. One of the most consistent findings relates to empathy with the majority of studies indicating that increased empathy predicts STS. This provides support for Figley's (1995; 2002) suggestion that empathy is the mechanism through which trauma is transmitted to the professional. Furthermore, emerging research indicates that emotional empathy is particularly predictive whilst cognitive empathy may protect against STS, suggesting empathy represents a double-edged sword (Robins et al., 2009). This has major implications for clinical practice as empathy is a key skill used by many professions, particularly psychological therapies, which suggests that professionals may need support to manage the negative effects of using emotional empathy. This may be particularly important in light of the recent recommendations made by the Francis Report (2013), which calls for increased compassionate care from health care professionals. Notably, empathy is a key element of such care (Department of Health, 2012) and so professionals may require support and training to ensure that they are able to use empathy as part of providing optimal compassionate care but are also to maintain their own emotional well-being.

Regarding the other major tenant of Figley's (1995; 2002) model, there is less support for the suggestion that exposure to work-related trauma is key to the development of STS, with little support for length of experience and inconsistent results for the proportion of traumatised clients seen. However due to the methodological issues of conceptualising and measuring exposure to trauma in these ways, these findings should be taken cautiously, particularly as qualitative research indicates that traumatic work-related events trigger STS. Studies which have measured exposure to work-related trauma in terms of the frequency or severity of events have found significant results (e.g. Komachi et al., 2012) and this appears to be a promising method of measuring exposure for future research.

Greater clarity in this area is particularly important for clinical practice because managers may need to consider how best to protect their staff if exposure is indeed related to STS. This could involve fairly simple measures, for example, caseload management is recommended to help provide a balance of high and low trauma cases (Bell, 2003). Good caseload management also helps to diversify the types of client difficulties a professional sees, enabling the professional to experience success and use a range of skills (Radey & Figley, 2007). This may help increase compassion satisfaction, which is potentially protective.

Turning to life events, whilst limited in terms of numbers and methodological issues, the evidence for the role of current life stress tends to indicate that high personal stress increases the likelihood of developing STS. However it is important to consider causality and the potential for STS and life stress to have a reciprocal relationship. Nevertheless, the findings suggest that professionals need to be more aware that personal stress can increase their vulnerability to work-related stressors and utilise coping strategies which will potentially benefit their well-being, both in work and at home. The evidence for the role of previous personal trauma is less clear and it seems that whilst it might increase vulnerability to STS, it is less important than more proximal factors. It is therefore unlikely to be helpful if all professionals with a history of trauma receive their own therapy. However, given that similar historical and work-related trauma may be linked, personal therapy may be worthy of consideration in these circumstances.

The findings also suggests several factors protect against STS. These include CS and detachment, which were included in Figley's (1995; 2002) model, but also social support and coping. Consistent correlational support is found for CS but without multivariate analysis, it is unclear whether it will remain important in the presence of other variables. It is also unclear whether CS is linked to other factors such as treatment outcomes, which may have implications for those working with terminal populations, for example. The evidence for detachment presents a greater conundrum and it seems possible that depending on the method of detachment, it may be effective in the short term but maintain STS in the long term (Benoit et al., 2007; Udipi et al., 2008). This could be because emotional detachment strategies

may impede the use of more adaptive strategies for managing distress however this has not been investigated.

The evidence for a lack of support is more convincing, with most studies reporting it predicts STS, although the quality of the studies was not optimal. Nevertheless, qualitative evidence is supportive and tends to suggest co-workers provide more effective support, seemingly due to their ability to understand and advise their colleagues from a position of experience. Whilst quantitative research would be helpful to confirm this, the results suggest that organisations should consider how social support can be built into the work environment, such as regular reflective practice groups. The effects of coping styles are less clear due to the lack of theory driven research. Nevertheless, taken cautiously, the evidence tends to indicate that some emotion-focused styles are associated with increased STS, whilst other more adaptive emotion-focused styles seem protective. However due to the lack of research in this area it is not possible to identify specific styles which are effective nor maladaptive. Further research is therefore imperative as once identified, training can be provided to increase professionals' use of effective coping strategies.

Lastly, there is insufficient evidence to conclude which professions are most at risk but based on the limited evidence, those who regularly work with on-going or multiple trauma may be more vulnerable. This again underscores the importance of more detailed research into the effects of exposure to work-related trauma. However, it is also possible that other factors such as the differential emphasis placed on clinical supervision or the level of autonomy in different professions may also impact on levels of STS but there is little research in these areas.

Overall, there is mixed evidence for the majority of factors and it is likely that this, in part, is due to the complex interactions between factors. However, whilst limited in numbers, the most convincing evidence suggests empathy and to a lesser extent, current life stress, are risk factors whilst social support seems protective. Further research is needed to confirm these factors, particularly as there is little research investigating the effects of STS on the standard of care provided. However, given the negative effects of substandard care (Francis, 2013), it seems important to

support health and social care professionals to have optimal well-being to enable them to provide an optimal service.

Methodological critique of reviewed studies

Overall there are several key issues which limit the findings discussed above. In particular, all but one of the studies relied on a cross-sectional design and consequently, causal relationships between some of the factors identified and STS cannot be established. Similarly, some studies reported only bivariate correlations and so it is impossible to identify whether the variables would have remained significant when taking into account other factors. Fortunately, the majority of studies utilised regression, which rectifies this problem. However, few used hierarchical regression and so it was unclear how much variance certain groups of predictors, such as coping styles, accounted for. This would have helped clarify their relative contribution to STS.

Several issues relate to the variety of scales used to measure STS, with some measuring just STS, such as the Secondary Traumatic Stress Scale (STSS; Bride, Robinson, Yegidis, & Figley, 2004). However others used scales which measure STS, burnout and CS such as the CSFT (Figley & Stamm, 1996) or its more recent revision, the Professional Quality of Life Scale-V (ProQOL; Stamm, 2010). This makes it difficult to compare results, particularly as the CSFT has undergone several revisions with changes to the scoring system. Complicating matters further, some scales measure symptoms over a week (STSS) and others a month (ProQOL), again making comparisons difficult. More importantly, these measures are designed to screen for STS and are not intended to be used for diagnostic purposes. Consequently, they are designed to be conservative to avoid missing professionals at risk, which may falsely inflate STS levels (Bride et al., 2007). Furthermore, some studies measured trauma symptoms using PTSD scales such as the Impact of Events Scale-Revised (Weiss & Marmer, 1997) which could be confounding as the wording may lead respondents to report primary rather than secondary trauma. Additionally, PTSD scales may fail to identify STS as they are designed to screen for clinically high levels of PTSD, not STS which is below clinical thresholds.

The research reviewed was also conducted across a range of countries and so one must be cautious in generalising the results to different cultures due to the differences in health and social care systems, which may confound results.

Notably, the review also included qualitative studies and whilst these cannot identify the extent to which one variable influences another, they represent a strength in that they can provide a richer understanding of issues raised by quantitative research. Positively, the majority of qualitative studies used recognised and well used methods of qualitative analysis such as thematic analysis or content analysis, although one did not specify the method used (Maiden et al., 2011), suggesting the latter results should be taken more cautiously. However, only a small number of studies reported that their themes and coding were checked for agreement by a second rater (Beck & Gable, 2012; Benoit et al., 2007; Maytum et al., 2004; Townsend & Campbell, 2009; Udipi et al., 2008; Yoder 2010), which limits the reliability of the remaining qualitative studies. Furthermore, the majority of qualitative studies failed to make explicit whether their data reached saturation, hence it is unclear whether further themes would have emerged had they recruited further participants.

Limitations of review

This review was limited by a number of factors. Due to the large number of articles available in this area, only published papers were included. Whilst this indicates that they are peer reviewed, suggesting reasonable quality, it introduces bias since studies demonstrating non-significant results are less likely to be published. Furthermore, due to the lack of systematic reviews in this area and the lack of reviews which consider predictors of STS in medical health professionals, this review had broad aims and inclusion criteria. Whilst this was useful as it identified support for otherwise uninvestigated factors such as empathy, which has mainly been investigated in medical health professionals, it meant that the studies included were heterogeneous, making it difficult to compare and synthesis the results.

Future research

Given that there is little consensus regarding the majority of factors, all would benefit from further research. However as described above, there are specific areas which would be particularly helpful to clarify. These include isolating which aspects of empathy are most predictive of STS, or indeed protective, which will help training programmes to safeguard future professionals. Similarly, examining the effect of problem-focused coping is important as these styles are considered most helpful (Gurung, 2010) but there is no evidence to confirm whether this can be generalised to STS. Additionally, measuring exposure to work-related trauma using more direct methods is necessary.

Furthermore, longitudinal research would also be beneficial to separate cause and effect and map the course of STS. Whilst longitudinal research can be costly and impractical depending on the outcomes measured and the target population, in this case it is more straightforward. For example, professionals can complete baseline measures during their induction and complete follow-up measures at certain intervals, including when they leave their post. Future research may also wish to clarify which professions are most at risk which would identify where resources need to be targeted, including whether professionals working with children are more at risk than those in adult services. Lastly, the confusion between STS and CF makes the two concepts difficult to separate and further research is needed to clarify whether STS is an element of CF. If this is the case, measures such as the ProQOL-V (Stamm, 2010) would benefit from having a combined score for STS and burnout to reflect an overall CF score.

Conclusion

This is the first review of predictors of STS, rather than a mixture of secondary trauma reactions, across all health and social care professions. The current literature is limited by the cross-sectional nature of the studies, the variety and limitations of measures used, and the lack of clarity between STS and CF. However, there is some evidence to suggest that empathy and life stress are risk factors for STS, whilst social support appears protective. Further research is needed to clarify the role of several factors, such as coping styles, and to identify whether

certain professions are more at risk of STS. This will better enable organisations to prevent STS from developing in their staff teams and to support individuals who are experiencing symptoms.

Predictors of Secondary Traumatic Stress (STS) and Burnout in Paediatric Nurses

Over the past twenty years there has been a growing recognition that providing support to distressed individuals can negatively affect the well-being of health and social care professionals, including nurses, and may lead to the development of secondary traumatic stress (STS) and burnout. STS refers to the trauma symptoms that professionals experience as a result of working with traumatised individuals. It is defined as "the natural, consequent behaviours and emotions resulting from knowledge about a traumatizing event experienced by a significant other. It is the stress resulting from helping... a traumatized or suffering person" (Figley, 1995, p. 10). STS develops quickly and mimics the symptoms experienced in post traumatic stress disorder (PTSD), including re-experiencing, hyper-arousal and avoidance.

Burnout on the other hand, refers to a diminished interest in work, accompanied by long-term exhaustion. It is characterised by emotional exhaustion, depersonalisation and reduced personal accomplishment (Maslach, 1982) and develops over an extended period of time. Traditionally, burnout can be experienced in any profession and is not exclusive to caring professions, however, it has more recently been investigated along with STS under the term compassion fatigue (CF), which is considered to be the combined effects of these two conditions (Stamm, 2010). This paper will therefore discuss research on burnout in relation to CF but will also integrate findings from more traditional studies of burnout from the nursing literature.

Whilst burnout has been widely researched in nursing, burnout in terms of CF, and STS have been predominantly investigated in social care and mental health practitioners as these professionals frequently work with populations who have experienced traumatic events such as child abuse. However there has been a growing recognition that medical health professionals such as nurses are also at risk, given they provide a high degree of direct patient care and are consequently also exposed to patients' trauma (Robins et al., 2009). For example, nurses may witness painful medical procedures, provide support around loss, or hear about how patients sustained their injuries, which may involve traumatic events such as

fire, accidents, or rape. Furthermore, paediatric nurses are potentially more at risk of developing STS and burnout as children are one of the most vulnerable groups in society and their traumatic experiences are considered to be more emotive (Figley 1995) making this population of particular interest.

Relationship between STS, burnout and Compassion satisfaction (CS)

STS and burnout have been found to be positively associated (Alkema et al., 2008; Simon et al., 2005; Slocum-Gori et al., 2013) but there is conflicting evidence as to whether professionals are more at risk of one condition or the other. For example, Conrad and Kellar-Guenther (2006) found social workers had high STS but low burnout, whereas another study found that whilst a large proportion of nurses had burnout, only a small number reported trauma symptoms (Mealer, Burnham, Goode, Rothbaum, & Moss, 2009). Whilst this appears to relate to the use of different measures, this indicates that the relationship between these constructs requires further investigation.

STS and burnout are also linked to compassion satisfaction (CS) which is the pleasure derived from giving care and together these three constructs are considered to constitute professional quality of life (Stamm, 2010). CS is suggested to be a protective factor which buffers the negative effects of working with traumatised people (Collins & Long, 2003) and so one would expect that it would be negatively associated with STS and burnout. Whilst research supports this, the results suggest that CS has a stronger negative association with burnout compared to STS (Alkema et al., 2008; Simon et al., 2005; Slocum-Gori et al., 2013). CS might therefore be less protective against STS, however this requires further research to confirm, particularly in paediatric nurses where it has not been investigated.

Factors associated with STS and burnout

Figley's (1995; 2002) model of compassion stress and fatigue[2] suggested a range of factors are linked to STS, with empathy and exposure to traumatised individuals viewed as fundamental to its development. He postulated that the empathy required

[2] Figley (1995) suggested that many clinicians feel uncomfortable with the term secondary trauma and so chose to use the term compassion fatigue as a more acceptable alternative.

in helping traumatised individuals requires emotional energy, which can lead to compassion stress (residual emotional energy). Combined with traumatic memories, life disruptions and prolonged exposure to traumatised clients, the residual compassion stress can develop into STS. However, the ability to detach from clients and a sense of satisfaction from one's role are suggested to be protective. Further research has also indicated that perceived social support and coping style might also protect against STS developing (Bride et al., 2007; Devilly et al., 2009; Von Rueden et al., 2010). However, little research has investigated any of these factors in paediatric nursing.

Regarding burnout, there is no specific model which has identified risk and protective factors but it has been widely investigated in the nursing literature and a range of factors are commonly reported. These comprise organisational factors such as workload and lack of support; personal factors such as coping style and empathy; and environmental factors such as life stressors (Duquette, Kerouac, Sandhu, & Beaudet, 1994; Dyrbye et al., 2006; Omdahl & O'Donnell, 1999). However, few studies have focused on paediatric nurses and those which do tend to look at paediatric oncology and investigate stress rather than burnout (Mukherjee, Beresford, Glaser, & Sloper, 2009). Consequently it is unclear whether findings from adult nursing can be generalised to paediatrics.

Nevertheless, the factors identified as risk and protective factors for both STS and burnout in the wider literature are potentially applicable for paediatric nurses. These are discussed below and include, empathy, current life stress, social support, and coping styles, which are suggested to be associated with both conditions. These are followed by exposure to work-related trauma and personal trauma history, which are associated with STS; and organisational stressors, which are associated with burnout.

Empathy.

Empathy is suggested to have both a cognitive and an emotional element, incorporating both the ability to understand another person's perspective and the emotional response one has to another's emotions (Davis, 1983). It is a core requirement in caring professions, including nursing, however it is considered to be

the key mechanism through which others' trauma symptoms are transmitted to the professional (Figley, 1995). As Conrad (2004) suggests, by empathising with a client, professionals can internalise their emotions, making them vulnerable to the negative effects of trauma.

Empathy has been investigated in a range of medical professionals including adult nurses, paediatric staff, medical personnel and genetic counsellors (Abendroth & Flannery, 2006; Badger et al., 2008; Crumpei & Dafinoiu, 2012; Omdahl & O'Donnell, 1999; Robins et al., 2009; Udipi et al., 2008). The majority of these focused on empathy and STS and found a positive association (Abendroth & Flannery, 2006; Crumpei & Dafinoiu, 2012; Robins et al., 2009; Udipi et al., 2008). Only one study failed to replicate these results (Badger et al., 2008) however the cognitive and empathy subscales were combined into an overall score, which is not recommended (Davis, 1983) and so these results should be taken cautiously. Whilst a smaller number of studies investigated empathy and burnout, these too found a positive association (Crumpei & Dafinoiu, 2012; Omdalh & O'Donnell, 1999; Robins et al., 2009).

Few studies investigated different types of empathy but emotional empathy was found to be most frequently associated with both STS and burnout (Crumpei & Dafinoiu, 2012; Omdahl & O'Donnell, 1999; Robins et al., 2009). This indicates emotional empathy might be a particular risk factor, possibly because the professional actually *feels* the client's emotion, rather than simply understanding it at a cognitive level.

There is therefore a small but fairly consistent body of evidence suggesting that empathy, and possibly emotional empathy in particular, is a risk factor for STS and burnout in health professionals. However no quantitative study has specifically focused on paediatric nurses, who spend many of their working hours providing direct care, suggesting further research is required for this specialist population.

Current life stress.

Lazarus and Folkman's (1984) model of stress and coping suggests a stress response occurs when individuals perceive that the demands on them exceed their resources. Given that STS and burnout can be conceptualised as extreme stress responses (Bomyea, Risbrough, & Lang, 2012; Payne, 2001), it is likely that stressors in both nurses' work and personal lives might be appraised as exceeding their resources, resulting in a stress response.

Regarding STS, Figley (1995) similarly proposed that in combination with other factors, life stressors can 'tip the balance' and increase the likelihood of STS developing. There is some support for this with increased life stress associated with STS in child welfare workers and therapists (Bonach & Heckert, 2012; Follette et al., 1994; Rossi et al., 2012) but also medical professionals (Abendroth & Flannery, 2006; Meadors & Lamson, 2008). The use of regression in most studies adds weight to the results, suggesting life stress remains important in the presence of other predictors. Similarly, qualitative research in oncology nurses is also supportive (Perry et al., 2011). However, some studies have failed to find a significant relationship (Adams et al., 2008; Bride et al., 2007; Mealer, Shelton, Berg, Rothbaum, & Moss, 2007).

Regarding burnout, less research has investigated the effect of life stressors compared to work-related stressors. However, experiencing work-home conflicts or negative life events over the past 12 months, have been associated with burnout in several professionals, including medical students, surgeons, nurses and social workers (Adams et al., 2006; Adams et al., 2008; Demir, Ulusoy, & Ulusoy, 2003; Dyrbye et al., 2011; Dyrbye et al., 2006).

The evidence therefore indicates that life stress is associated with increased STS and burnout, although the evidence is more mixed for STS. However only one of the above studies used a validated measure of life stress (Meadors & Lamson, 2008) and so the results as a whole should be taken cautiously. Nevertheless, this suggests further investigation of life stress in paediatric nurses has some merit, particularly with the use of more robust measures.

Social support.

Social support can be categorised as emotional, instrumental, informational or companionship and can be provided by a variety of sources including colleagues, family, friends, and professionals. A lack of support has been related to burnout and more recently, STS. These are discussed in turn below.

Social support has been negatively associated with burnout in a variety of nurses including, critical care, psychiatric, oncology and paediatric nurses (Barnard, Street, & Love, 2006; Boyle, Grap, Younger, & Thornby, 1991; Jenkins & Elliott, 2004; Kilfedder, Power, & Wells, 2001; Oehler & Davidson, 1992; Oehler, Davidson, Starr, & Lee, 1991; Townsend & Campbell, 2009). Most studies focused on co-worker support but one study comparing sources of support found co-worker support was a better predictor of burnout than non-work related sources (Boyle, et al., 1991). It therefore appears that there is some consensus that social support, especially from co-workers, reduces burnout in nurses. However the majority of evidence comes from traditional burnout studies and only one study has investigated social support and burnout using compassion fatigue measures (Townsend & Campbell, 2009), suggesting these areas require integrating.

In contrast to burnout, social support has only recently emerged as a protective factor for STS. Nevertheless, it is thought to help professionals maintain a positive attitude towards their job, negating the negative effects of supporting traumatised populations (Tehrani, 2007). Little research has investigated this in nursing staff, however one study found a lack of support was associated with STS (Von Rueden et al., 2010). Similarly, qualitative research suggests social support can mitigate the effects of traumatic work-related experiences (Beck & Gable, 2012; Maytum et al., 2004; Perry et al., 2011). This is similarly supported by research from social care and mental health professionals (Bonach & Heckert, 2012; Bride et al., 2007; Devilly et al., 2009; Horwitz, 2006; Killian, 2008; MacRitchie & Leibowitz, 2010; Ortlepp & Friedman, 2002), although some studies found no association (Adams et al., 2008; Badger et al., 2008). However these measured support from friends and family or general support, which may be less effective because friends and family are considered less able to empathise with work-related difficulties or offer informed advice (Benoit et al., 2007).

Consequently, there is emerging evidence that social support is protective against STS, but no studies have examined this in paediatric nurses. However, there is greater support for its association with burnout, suggesting that it is an important factor to consider.

Coping styles.

Coping styles are considered to be the cognitive or behavioural ways in which individuals attempt to manage stressors (Lazarus & Folkman, 1984). A variety have been identified in the literature and can be categorised as problem-focused strategies, which address the source of stress, and emotion-focused strategies, which attempt to manage the distress caused by the stressor (Lazarus & Folkman 1984). Traditionally, emotion-focused coping has been considered more maladaptive than problem-focused coping (McVicar, 2003). Coping styles have been more widely investigated in burnout compared to STS and the evidence for these relationships is discussed in turn below.

A variety of research in the nursing literature indicates that emotion-focused coping tends to be associated with higher burnout (Ben-Zur & Michael, 2007; Boyle et al., 1991; Ceslowitz, 1989; Payne, 2001). However, separating coping styles into emotion-focused and problem-focused styles can be overly simplistic (McVicar, 2003). For example, some styles of emotion-focused coping such as positive re-appraisal or self-control are associated with *low* burnout (Ceslowitz, 1989; Payne, 2001). Furthermore, emotion-focused coping has been associated with burnout in one paediatric study (Liakopoulou et al., 2008) but not in another (Robins et al.,2009). It is therefore unclear whether results from adult nursing generalise to paediatric nursing. Consequently, this requires further investigation, particularly in relation to paediatric nurses as previous paediatric studies have included a variety of paediatric professionals, which may confound the results.

Unlike burnout, there is limited research regarding STS and coping within nursing or the wider health and social care literature. Furthermore, the majority of studies focused on idiosyncratic coping strategies rather than using standardised measures,

making comparison difficult. Nevertheless, some emotion-focused coping strategies such as substance use or attempting to forget clients' traumatic disclosures have been associated with STS (Follette et al., 1994; Von Rueden et al., 2010). However, other emotion-focused coping strategies such as prayer, engagement in hobbies and relaxation have been associated with low STS (Beck & Gable, 2012; Quinal et al., 2009; Von Rueden et al., 2010; Yoder, 2010). Only two studies have employed standardised measures and both used factor analysis to produce higher-order domains. However the results were inconclusive whereby one study found no association between coping and STS (Robins et al., 2009), whilst the other reported that STS was significantly predicted by emotion-focused styles (Udipi et al., 2008).

Consequently, whilst burnout and STS are both broadly associated with the use of emotion-focused coping strategies, some emotion-focused strategies such as positive reappraisal appear to be adaptive. Consequently, dichotomising coping strategies into higher order domains of problem-focused and emotion-focused coping appears overly simplistic and loses information. This suggests further research needs to consider coping styles in greater detail rather than broader categories, particularly in paediatric nurses where there is a dearth of such research.

Exposure to work-related trauma.

Unlike burnout, exposure to work-related trauma is considered fundamental to the development of STS (Figley, 1995). However, results from the mental health and social care literature are inconclusive (Elwood et al., 2011) and few studies have investigated this in paediatric nursing. However the limited evidence from nursing studies mirrors the wider literature, with only one study finding a negative association between years experience and STS (Von Rueden et al., 2010), whilst others found no relationship (Alkema et al., 2008; Czaja et al., 2012; Potter et al., 2010). Notably, where a significant relationship was found, it tended to be inverse, which may reflect that less experienced professionals have not yet developed effective coping strategies (Nelson-Gardell & Harris, 2003). Furthermore, one study found no association between hours spent with patients and STS (Meadors et al., 2009).

The evidence for the relationship between STS and exposure to work-related trauma is therefore mixed which might be due to how exposure is conceptualised and measured. As Elwood et al. (2011) suggest, measuring exposure to work-related trauma using years experience or caseload can be misleading as the exposure level is often inferred. For example, 30 years experience may not equate to high levels of exposure in practice as such professionals might have less direct contact with clients as they become more senior and take on a supervisory role. More direct methods of measuring exposure are therefore needed. Some studies have measured the frequency or perceived severity of profession-specific events, such as the death of a patient, and both were found to significantly predict STS (Komachi et al., 2012; Udipi et al., 2008). However, this has not been done in the paediatric nursing population nor using standardised scales and therefore merits investigation.

Personal trauma history.

Again, unlike burnout, professionals who have personal experience of trauma are suggested to be more vulnerable to developing STS as work-related trauma can trigger traumatic memories (Pearlmann & Saakvitne, 1995). There is a dearth of research regarding this in paediatric nursing, adult nursing or other medical health professionals and whilst it has been investigated in wider professionals, the evidence is mixed. A positive association between trauma history and STS has been found in social workers, child protection workers and therapists (Bride et al., 2007; Choi, 2011; Deighton et al., 2007; Ghahramanlou & Brodbeck, 2000; Jenkins & Baird, 2002; Nelson-Gardell & Harris, 2003; Tosone et al., 2011). However, no relationship has been found in these populations by other studies (Adams et al., 2006; Boscarino et al., 2004; Creamer & Liddle, 2005; Devilly et al., 2009; Follette et al., 1994; Ortlepp & Friedman, 2002; Rossi et al., 2012).

The discrepant results may relate to the type of trauma history experienced. For example, Creamer and Liddle (2005) suggest that work-related trauma may not trigger personal memories if it is too dissimilar to the historical events. Alternatively, some evidence indicates that trauma history is predictive when

considered with other distal factors such as attachment style (Tosone et al., 2011). However, it becomes less important when taking into account more proximal factors such as current life stress (Adams et al., 2006; Follette et al., 1994; Rossi et al., 2012).

Evidence is therefore mixed for whether a personal history of trauma increases vulnerability to STS and this may depend upon the similarity of the trauma or the presence of more proximal factors but this requires further research to confirm. Furthermore, due to the lack of research around trauma history in nursing, it is unclear whether the findings from other professions can be generalised to this area, making further research important.

Organisational stressors.

Whilst STS is associated with work-related trauma, burnout is more frequently associated with wider work-related stressors. In particular, burnout is positively related to poor working relationships with other nurses and physicians (Duquette, Kerouac, Sandhu, Ducharme, & Saulnier, 1995; O'Mahony, 2011; Payne, 2001; Poncet et al., 2007; Watson & Feld, 1996); working with patients who are suffering or dying (Payne, 2001; Poncet et al., 2007; Watson & Feld, 1996); workload (Duquette et al., 1995; Galindo, de Oliveira Feliciano, dos Santos Lima, & de Souza, 2012; Maytum et al., 2004; O'Mahony, 2011; Watson & Feld, 1996; Yoder, 2010); and management or administrative difficulties (Girgis, Hansen, & Goldstein, 2009; O'Mahony, 2011; Poncet et al., 2007).

It is less clear however whether particular stressors are more predictive than others. This in part seems to relate to the field of nursing. For example, hospice nurses are more likely to report encountering psychological stressors such as patient deaths and inadequate preparation to deal with patients' emotional needs (Payne, 2001; Power & Sharp, 1988). Conversly, learning disability nurses are more likely to report environmental stressors such as workload and psychosocial stressors such as conflict with other colleagues (Power & Sharp, 1998). The most predictive stressors may therefore be context dependent. For nurses working in areas where patients are at high risk of mortality, such as hospices, intensive care units (ICU)

and oncology, psychological stressors may be more likely to be associated with burnout. However, in more general units, social and environmental stressors might be more predictive.

Consequently, organisational stressors appear important predictors which may impact on burnout levels between departments (see following section). Unfortunately, there is a dearth of research which has investigated organisational stressors and burnout within the CF literature. Given their importance, the latter literature may be overlooking a key risk factor and further research is required to integrate these areas.

Area of nursing

Area of nursing may also affect the risk of nurses developing both STS and burnout. For example, departments with a high mortality risk such as oncology, emergency, and ICUs are considered to be emotionally, physically and technologically demanding (Franco, Bottura Leite de Barros, Nogueira-Martins, & Zeitoun, 2011; Liakopoulou et al., 2008). This may theoretically increase the risk of developing STS and burnout.

Few studies have compared areas of nursing in relation to STS but the limited research found no evidence that STS levels varied across different departments (Czaja et al., 2012; Hooper et al., 2010). However, Hooper et al. (2010) reported a trend towards oncology nurses being at greater risk and with a larger sample they may have detected a significant effect. Furthermore, Czaja et al. (2012) measured PTSD rather than STS hence the cut-offs for trauma symptoms would have been higher than those needed for STS. Therefore, based on two studies only, it is impossible to rule out whether area of nursing affects STS, particularly in paediatric nursing where the suffering of a child is particularly emotive.

Regarding burnout, the evidence is inconsistent. Some studies found no differences between departments (Hooper et al., 2010; Liakopoulou et al., 2008; Yoder, 2010), but others found increased nursing burnout in departments with a high mortality risk, including ICU, emergency, oncology and acute paediatrics (Franco et al.,

2011; Ilhan, Durukan, Taner, Maral, & Bumin, 2008; Ksiazek, Stefaniak, Stadnyk, & Ksiazek, 2011; Oehler & Davidson, 1992; van Servellen & Leake, 1993). This is consistent with the suggestion that these departments are more demanding (e.g. Franco et al., 2011) and are more likely to involve psychological stressors as previously discussed.

It is therefore possible that paediatric nurses in high mortality risk departments, such as paediatric intensive care units (PICU) and paediatric oncology, will experience higher burnout levels. They may also experience higher STS given they are likely to be exposed to increased work-related trauma by virtue of their patients' condition but further research is required to confirm this.

Cultural issues

Little research has been conducted in British hospitals, particularly regarding STS. This has major implications because health systems differ between countries and so nurses may experience different working environments and stressors. For example, stressors may vary according to funding or whether health insurance is required for treatment compared to countries such as Britain where treatment is free at the point of delivery. Consequently, it cannot be assumed that other studies' findings can be generalised to British nurses. It is therefore essential that the prevalence and predictors of these conditions are clearly identified within British hospitals if the National Health Service (NHS) is to have a clearer image of the scope of the problem and where intervention is needed.

Rationale for current research

Overall, three areas require clarification. Firstly, a variety of factors associated with STS and burnout have been identified, and whilst some have been investigated in adult nursing, few have been investigated in paediatric nurses. Furthermore, the majority of paediatric studies included several professions within their samples, making it difficult to ascertain risk factors for paediatric nurses specifically. This represents a major gap in the literature given professionals working with children are considered particularly vulnerable (Figley, 1995). Additionally, it is unclear

whether the factors identified in the traditional burnout literature will also be associated with burnout when measured as part of CF.

Secondly, some evidence indicates that departments with a high mortality risk in adult nursing, such as ICUs or oncology, are at higher risk of burnout but there is little research around STS nor paediatric nurses. Further research is therefore needed to clarify whether certain paediatric departments are at greater risk so support can be targeted appropriately. Lastly, the relationship between STS, burnout and CS is unclear and requires further investigation. This is important for both theory and clinical practice as it will inform managers as to whether nurses experiencing one condition might also be experiencing, and require support, with the other condition too.

Aims and hypotheses

The aims of this study were therefore:

1) To identify the prevalence of STS and burnout in paediatric nurses and compare whether departments with a high mortality risk have higher levels than departments with a low mortality risk.
2) To identify whether STS and burnout in paediatric nurses can be predicted by work-related factors and individual factors.
3) To explore the relationship between STS, burnout and CS.

It is hypothesised that:

1) Nurses from PICU and paediatric oncology will experience higher levels of STS and burnout than nurses from departments with a low mortality risk.
b) Specialising in areas with a high mortality risk (PICU and paediatric oncology) will be a stronger predictor of STS and burnout than working in low risk departments.

2) High emotional empathy, exposure to work-related trauma, high life stress, a personal trauma history, coping style and a lack of support will be associated with high levels of STS.
3) High levels of organisational stressors, coping style, high emotional empathy and a lack of support will be associated with high levels of burnout.
4) STS and burnout will be positively correlated, however there will be a difference in the proportion of nurses experiencing STS and burnout.

b) STS and burnout will be negatively correlated with CS.

Method

Design

A cross-sectional, questionnaire-based survey was employed. Outcome variables comprised STS and burnout, whilst predictor variables included empathy, exposure to work-related trauma, current life stress, coping, social support, trauma history, organisational stressors and department. Power calculations using G*Power version 3 (Faul, Erdfelder, Lang & Buchner, 2007) indicated that assuming an effect size at least as great as Robins et al. (2009) was achieved ($r^2 = 0.15$), 106 participants were needed to test six predictors in the regression models with 84% power and 5% significance level. A between subjects design was utilised to compare departments with high and low mortality risks on STS and burnout levels.

Participants

Participants were recruited from Southampton General Hospital's paediatric department. Approximately 400 paediatric nurses were invited to participate and were selected on the basis that they were employed as a nurse working in an inpatient paediatric department[3]. These comprised, PICU, oncology, cardiology, surgery, general medical, nephrology, orthopaedics, paediatric assessment unit (PAU), and day surgery. Nursing staff were included if they worked day shifts, night shifts or both. Those excluded from the study comprised non-nursing paediatric staff; nursing staff from outpatient paediatrics; and nursing staff from adult departments. 84 members of nursing staff, including 5 HCAs, participated giving a 21% recruitment rate. The characteristics of the sample are shown below.

[3] During recruitment, feedback indicated that a number of wards had a large proportion of health care assistants (HCAs) within their nursing teams. These were also included in the study on the basis that they perform a similar role to qualified nurses and other nursing studies have included untrained nursing staff. This amendment was given ethical approval.

Table 2.

Sample characteristics.

	Total (% expressed in brackets) N=84
Age (years)	
Mean	34.86
SD	11.06
Range	20 - 64
Gender	
Male	3 (3.5%)
Female	81 (96.5%)
Post	
Nurse	79 (94.1%)
HCA	5 (5.9%)
Pay scale 'banding'	
Mean	5
Range	2 -7
Hours worked per week	
Mean	33.26
SD	6.65
Range	7.5 - 40
Number of years experience	
Mean	12.55
SD	11.22
Range	0.5-43
Number of years in current post	
Mean	6.12
SD	5.35
Range	0.05-25.5
Peadiatric department	
PICU	21 (25%)
Oncology	7 (8.3%)
Cardiology	11 (13.1%)
Surgery	7 (8.3%)
General medical	5 (5.8%)
Nephrology	3 (3.65)
Assessment	16 (19%)
Day surgery	4 (4.8%)
Orthopaedics	10 (11.9%)

Measures

A demographic information sheet gathered information on age, gender, number of years experience, years in current post, banding, working hours, type of shifts, and department.

Professional Quality of Life Scale (ProQOL-V; Stamm, 2010).

The ProQOL-V was used to measure STS, burnout and CS and is widely used in the literature. It is a 30-item scale comprised of the three subscales, CS, burnout and STS. Respondents answer on a 5-point Likert scale with the anchors *never* to *very often* and a total score is calculated for each of the three subscales. There is no overall score. Cut-offs are set at the 25th and 75th percentiles and a score of 43 or below is classed as low; 44 – 56 is moderate; and 57 or above is high.

The ProQOL has good reliability with alpha coefficients of .88 for CS, .75 for burnout and .81 for STS (Stamm, 2010). In this study, the alpha coefficients were .82, .71 and .79 respectively. It has good construct validity with little shared variance between the subscales. Inter-correlations between CS and STS show 2% shared variance and between CS and burnout, 5% shared variance (Stamm, 2010). The inter-correlation between burnout and STS is higher, r=.58, with 34% shared variance however this is due to the distress which is common to both conditions (Stamm, 2010).

Interpersonal Reactivity Index (IRI; Davis, 1983).

The IRI was used to measure empathy and has been previously used in this area, making comparisons with the literature easier. It is a 28-item self-report questionnaire which assesses capacity for empathy and consists of four subscales. Perspective taking measures the extent to which respondents adopt the perspective of others; fantasy measures identification with fictional characters; personal distress measures anxiety and discomfort associated with others' distress; and empathic concern measures feelings of concern for others. Respondents answer on a 5-point Likert scale ranging from 0 to 4 with the anchors, *does not describe me well* and *describes me well.* It has adequate reliability with alpha coefficients for each subscale ranging from .70 to .78 (Davis, 1983). In this study all were above .70 apart from empathic concern, which was dropped from the analysis.

Brief COPE (Carver, 1997).

The Brief COPE was used to measure coping styles. It assesses 14 different styles comprising, self-distraction; active coping; denial; substance misuse; use of emotional support; use of instrumental support; behavioural disengagement; venting; positive reframing; planning; humour; acceptance; religion; and self-blame. It is a 28-item self-report questionnaire based on the full version, the COPE (Carver, Scheier, & Weintraub, 1989). Respondents answer on a 4-point Likert scale ranging from 1 to 4 with the anchors, *I haven't been doing this at all* to *I've been doing this a lot.* Whilst initially developed using samples of cancer patients and hurricane victims, the Brief COPE has been used by other researchers investigating STS and burnout (e.g. Robins et al., 2009), making comparisons with the literature easier. The alpha coefficients are slightly lower than desirable with 11 out of 14 coping styles reported as .60 or above (Carver, 1997). In the current study they ranged from .71 to .95, apart from denial, which was dropped from the analysis.

Nurse Stress Scale (NSS; Gray-Toft & Anderson, 1981).

The NSS was used to measure nurses' exposure to traumatic work-related events, organisational stressors, and social support (co-worker). It is a 34-item self-report questionnaire and provides a global nursing stress score, in addition to scores for its eight subscales. These comprise, death and dying; conflict with physicians; conflict with other nurses; workload; uncertainty concerning treatment; inadequate preparation; and lack of support. Respondents answer on a 4-point Likert scale ranging from 0 to 3, with the anchors, *never* to *very frequently.* The test-retest coefficient was .81 and internal consistency was good with an alpha coefficient of .89. The validity is also good with the NSS correlating significantly with measures of trait anxiety, state anxiety and job satisfaction (Gray-Toft & Anderson, 1981). In the current study all alpha coefficients were above .70 apart from the inadequate preparation subscale, which was dropped from the analysis.

Traumatic Events Questionnaire (TEQ; Vrana & Lauterbach, 1994).

The TEQ civilian version was used to measure previous trauma history. It is an 11-item scale which assesses specific trauma events which are considered predecessors to PTSD. These include, fires/explosions; serious accidents; sexual

assault/rape; natural disasters; violent crime; adult abusive relationships; physical/sexual childhood abuse; witnessing serious violence; life threatening situations; and the violent or unexpected death of a loved one. It also includes two non-specific questions, 'other event' and 'event I can't tell about'. Respondents answer yes or no to each item and if yes, they are asked several probe questions which are consistent with the DSM-IV-TR (APA, 2000) criterion for PTSD. These are answered using a 7-point Likert scale ranging from 1 to 7, and anchored by *not at all* and *severely.* It provides an overall score for frequency of traumatic events and an intensity score for the most traumatic event. Test-retest reliability is reported to be very high (.91) for the total scale, although data for the individual questions were not reported (Lauterbach & Vrana, 1996). Construct validity is also good with TEQ scores significantly predicting depression, anxiety and PTSD (Crawford, Lang, & Laffaye, 2008; Vrana & Lauterbach, 1994).

The TEQ was chosen because its wording is less emotive than alternative questionnaires and it allows participants to add their own event. It also includes probes for how traumatic the events were at the time and at present, which is not assessed by other measures.

Perceived Stress Scale (PSS: Cohen, Kamarck, & Mermelstein, 1983). An amended version of the PSS was used to measure current life stress. It is a 10-item self-report questionnaire which measures the degree to which respondents have found life uncontrollable, unpredictable and overloading over the past month and is a widely used measure of appraised stress. Respondents answer on a 5-point Likert scale ranging from 0 to 4, with the anchors *never* to *very often.* With permission from the author (Cohen, 2012; personal communication), participants were instructed to base their answers on their personal lives and discount work-related stress. The PSS has good internal reliability with a coefficient alpha of .78 (Cohen & Williamson, 1988) and reasonable construct validity with PSS scores moderately correlated with other measures of appraised stress (Cohen & Williamson, 1988). In the current study the alpha coefficient was .87.

Procedure

Potential participants were given a study pack via their 'pigeon holes' containing an information sheet, consent form, questionnaires and a debriefing sheet

(appendix 3). Completed questionnaires and consent forms were returned by posting them into a locked box in their staffrooms. All questionnaires were anonymous. The researcher also visited handover meetings to raise awareness of the study and answer any questions. Participants were given 8 weeks to return their questionnaires and their participant numbers were entered into a prize draw for three sets of £50 highstreet vouchers.

Ethics

Ethical approval was obtained through the University of Southampton School of Psychology Ethics Committee (see appendix 4) and the University Hospital Southampton NHS Trust Research and Development Department (appendix 5). Approval from the National Research Ethics Service (NRES) was unnecessary as participants were recruited by virtue of their professional role (NRES, 2012).

Results

Statistical analysis

Data were analysed using SPSS (version 20). The ProQOL-V STS and burnout subscales were normally distributed as were the IRI and PSS. Some subscales of the NSS, brief COPE and TEQ were positively skewed based on Shapiro-Wilk tests and histograms. However the decision was taken to avoid transforming the data as the majority were normally distributed. Outliers above three standard deviations were replaced with figures two standard deviations above the mean of the relevant subscale (Field, 2009), which improved the skew on several subscales. Data which continued to violate assumptions of normality were converted into low and high categorical variables based on the histograms' distributions. These comprised, the TEQ, and the substance use, behavioural disengagement, religion and self-blame subscales of the brief COPE.

Hypothesis 1 was investigated using MANOVA as this takes account of the interaction between the dependent variables. MANOVA requires each group has more participants than the number of variables, therefore departments needed to be merged for further analysis. As the data for individual departments violated assumptions of normality, Kruskall-Wallis non-parametric ANOVA was used to check there were no differences in STS and burnout levels between departments. As none were found, departments were grouped by mortality risk, with PICU and paediatric oncology in the high risk group and all other departments in the low risk group. A MANOVA was then conducted. When grouped by mortality risk, data met the assumptions for univariate normality and from this, multivariate normality was assumed (Field, 2009). Data also met assumptions for equal univariate variance and Box's test was non-significant, indicating that it met assumptions for equality of covariance matrices.

Hypotheses 2 and 3 was investigated using multiple regression. Bivariate correlations were conducted on all variables of theoretical interest and those which significantly correlated with STS or burnout were entered into the regression

models using the enter method. Correlations between variables were checked for strong correlations to avoid multicollinearity however there were none.

The data for the regression models were checked for multicollinearity, influential outliers, linearity and homoscedasticity and met all assumptions. Less than 5% of cases had standardized residuals over ±2 and no cases were outside ±2.5 therefore the models can be assumed to be accurate (Field, 2009). However approximately half of the cases had Mahalanobis distances greater than 15 indicating that some multivariate outliers may have had greater leverage on the models. The results should therefore be interpreted cautiously.

It is acknowledged that there were more predictors entered into the regression analyses than power calculations suggested. It was considered whether the brief COPE could be reduced through factor analysis however a sample size of 84 is considered very poor for such an analysis (Tabachnick & Fidell, 2005). Additionally, given there is little research regarding coping styles and STS, it felt more appropriate to enter all significant subscales to look at their individual effect on the outcome variables rather than losing this detail through data reduction techniques. Furthermore, as many of the bivariate correlations demonstrated a moderate effect (Cohen, 1992), a high level of power was not as essential to detect significant effects.

Hypothesis 4 was investigated using Pearson's correlations.

Differences in STS and burnout according to department.

As can be seen in table 3, oncology reported the highest average scores for STS and burnout however a Kruskal-Wallis analysis indicated that there were no significant differences between department for STS, $H(8)=3.23$, $p=.45$; nor burnout, $H(8)=7.87$, $p=.92$.

Table 3.

Average scores for STS and burnout by department.

	STS		Burnout	
	Mean	SD	Mean	SD
PICU (N=21)	49.81	12.16	47.03	10.27
Oncology (N=7)	53.26	12.46	56.35	12.37
PAU (N=16)	51.14	8.54	48.86	11.08
Surgery (N=7)	50.87	8.72	54.34	7.06
Nephrology (N=3)	44.96	14.99	55.59	8.16
General medical (N=5)	52.25	7.71	50.07	11.29
Orthopaedics (N=10)	50.21	11.44	49.87	9.14
Cardiology (N=11)	47.09	5.17	47.39	6.06
Day surgery (N=4)	46.81	12.34	56.26	13.44

As there were no significant differences in departments, they were grouped into high and low mortality risk, with PICU and paediatric oncology in the high risk group, and all other departments in the low risk group. A MANOVA was then conducted using Pillai's trace statistic, which is most robust when sample sizes are unequal (Field, 2009). However there was no significant effect for department on STS and burnout, V= .01, F(2,80)=.55, p=.58.

Factors associated with STS and burnout

Pearson's correlations were initially run for STS and burnout with all variables of theoretical interest. As can be seen from table 4, a variety of variables demonstrated significant correlations. Notably, there was no significant relationship for either of the dependent variables with exposure to work-related trauma in terms of years in post or hours worked per week. However, exposure to work-related trauma in terms of death and dying demonstrated a moderate positive correlation with STS. Furthermore, both a lack of support and current stress correlated with STS and burnout. Emotional empathy (fantasy and personal distress) was also correlated with both outcomes, but it appeared more relevant for STS, with personal distress demonstrating a strong correlation (Cohen, 1992). A variety of coping styles correlated with STS and burnout, with self-distraction,

planning, behavioural disengagement and self-blame particularly relevant for both outcomes. However, correlations for demographic factors and previous trauma history were non-significant.

Table 4.

Pearson's correlations for STS and burnout with demographic factors, organizational factors, empathy, life stress, coping styles and trauma history.

	STS (N=83)	Burnout (N=83)
Demographic factors		
Age	-.16	-.04
Gender	-.03	-.01
Organisational factors		
Years qualified	-.16	-.08
Years in post	-.04	-.07
Hours worked per week	.16	.16
Death and dying	.31**	.14
Conflict with physician	-	.43***
Conflict with other nurses	-	.44***
Workload	-	.54***
Uncertainty with treatment	-	.21
Nursing stress scale total	-	.47***
Social Support		
Lack of support	.42***	.53***
Empathy		
Fantasy	.35**	.04
Personal distress	.52***	.28*
Perspective taking	.03	.06
Current life stress		
PSS	.54***	.54***
Coping styles		
Self-distraction	.44***	.43***
Active coping	.33**	.27*
Uses emotional support	.21	.13
Uses instrumental support	.31**	.19
Venting	.37**	.28**
Positive reframing	.24*	.09
Planning	.38***	.44***
Humour	.23*	.23*
Acceptance	.31**	.16
Substance use	.22*	.22*
Behavioural disengagement	.44***	.45***
Religion	.29**	.05
Self-blame	.39***	.45***
Personal trauma history		
TEQ	.19	-

*p<0.05; ** p<0.01; ***p<0.001

Significant correlates were then entered in regression analyses. The regression model for STS is shown in table 5. Predictors for exposure to work-related trauma, lack of support, empathy, current stress and coping styles were entered into the model. These accounted for 62.3% of the variance in STS, R^2 =.62, F(17,64)= 6.14, p<.001. The predictors which reached statistical significance were personal distress (*t*(66)=4.40, p<.001) and PSS (*t*(66)=2.59, p<.05), indicating that higher emotional empathy and current life stress significantly predict STS.

Table 5.
Regression model for STS

	B	SE B	β
Exposure to traumatic work-related events			
Death and dying	.08	.27	.03
Social support			
Lack of support	.95	.51	.18
Empathy			
Fantasy	.27	.17	.15
Personal distress	1.20	.27	.41***
Current life stress			
PSS	.42	.16	.28*
Coping styles			
Self-distraction	-.39	.67	-.07
Active coping	-.03	.88	-.01
Uses instrumental support	-.02	.56	-.00
Venting	.29	.72	.05
Positive reframing	.52	.78	.08
Planning	.93	.76	.16
Humour	.22	.67	.04
Acceptance	-.41	.78	-.07
Substance use	-.72	2.01	-.03
Behavioural disengagement	3.95	2.29	.18
religion	-.13	1.91	-.01
Self-blame	-.18	2.54	-.01

*p<.05; **p<.01; ***p<.001

The regression model for burnout is shown in table 6. Predictors for organizational factors, lack of support, empathy, current stress and coping styles were entered into the model. These accounted for 56% of the variance in burnout, R^2 =.56, F(14,67)= 5.99, p<.001. The predictors which reached statistical significance were lack of support (*t*(68)=22.02, p<.05); personal distress (*t*(68)=2.02, p<.05); PSS (*t*(68)=2.01, p<.05) and behavioural disengagement (*t*(68)=.2.35, p<.05), indicating

that low social support and high emotional empathy, current life stress and behavioural disengagement significantly predict burnout.

Table 6.

Regression model for burnout

	B	SE B	β
Organisation stressors			
Conflict with physician	-.42	.54	- .11
Conflict with other nurses	.12	.38	.04
Workload	.45	.31	.17
Empathy			
IRI personal distress	.57	.28	.20*
Social support			
Lack of support	1.23	.61	.23*
Current life stress			
PSS	.33	.16	.22*
Coping styles			
Self-distraction	.26	.65	.05
Active coping	-1.11	.76	- .19
Venting	-.26	.71	- .04
Planning	1.49	.83	.26
Humour	.30	.69	.05
Substance use	-1.08	2.14	-.05
Behavioural disengagement	5.44	2.31	.24*
Self-blame	.53	2.70	.02

*p<.05

Relationship between STS, burnout and CS

As shown in table 7, Pearson's correlations indicated that STS and burnout were significantly positively correlated. It was also hypothesized that the proportion of nurses with STS and burnout would differ. However, 48.2% of nurses were in the moderate range for STS, and 20.2% were in the high range, whilst 54.2% of nurses were in the moderate range for burnout and 21.7% in the high range, suggesting similar levels of STS and burnout were experienced.

Table 7.

Pearson's correlations for STS, burnout and CS

	STS	Burnout
STS	-	
Burnout	.49***	-
CS	-.18	-.58***

*p<.05; **p<.01; ***p<.001

Regarding CS, 26.5% of nurses had low CS. Burnout and CS were strongly, negatively correlated, however the results for STS and CS were non-significant.

Discussion

This study aimed to identify the prevalence of STS and burnout in paediatric nurses and whether certain departments were more at risk than others. It also aimed to determine the predictors of these conditions and identify the relationship between STS, burnout and CS. 68% of nurses reported moderate to high levels of STS and 76% reported moderate to high burnout, which is comparable with adult nursing (Abendroth & Flannery, 2006; O'Mahony, 2011). There were no significant differences in the levels of STS or burnout between individual departments, nor when grouped by high and low mortality risk. Hypothesis 1 was therefore unsupported. There was however partial support for hypotheses 2 and 3, with the results indicating that personal distress (emotional empathy) and current life stress significantly predicted STS; whilst burnout was significantly predicted by personal distress, current life stress, lack of support and behavioural disengagement. Hypothesis 4 was also partially supported with the results indicating that CS was strongly negatively correlated with burnout but not STS. Additionally, the proportion of nurses experiencing STS and burnout were similar, which was not predicted. The results in terms of department, individual predictors and the link between STS, burnout and CS are discussed in detail below.

Area of nursing

To the author's knowledge, this is the first study to explore both STS and burnout in paediatric nurses and to compare paediatric departments. As hypothesised, paediatric oncology had the highest average scores for both STS and burnout however these results were non-significant. Regarding STS, this is somewhat surprising as oncology and PICU nurses work in environments which frequently expose them to potentially traumatic experiences such as witnessing painful procedures or the death of a child (Maytum et al., 2004). However, oncology had few participants (N=7) and possibly with higher numbers, a significant effect would have been detected. Nevertheless, the results are consistent with previous literature which also failed to detect any significant differences between departments (Czaja et al., 2012; Hooper et al., 2010).

The results are also surprising for burnout given that departments with a high mortality risk such as PICU and oncology are considered particularly demanding (Franco et al., 2011) and burnout has been found to be higher in similar adult departments (Franco et al., 2011; Ilhan et al., 2008; Ksiazek et al., 2011; Oehler & Davidson, 1992; van Servellen & Leake, 1993). This discrepancy could relate to the measures used. The above studies utilised the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1993) which has three subscales and whilst some studies found overall burnout differed by department, others only found differences on individual subscales, particularly decreased personal accomplishment (Franco et al., 2011; Ilhan et al., 2008; van Servellen & Leake, 1993). It is therefore possible that the ProQOL-V's reliance on an overall burnout subscale is too insensitive when trying to detect differences between departments. However, other studies also failed to find differences between departments (Hooper et al., 2010; Liakopoulou et al., 2008; Yoder, 2010). Consequently, it is possible that STS and burnout are more strongly influenced by individual factors rather than the department. These are discussed below.

Predictors of STS and burnout

The models for STS and burnout have some commonalities with emotional empathy and current life stress predicting both STS and burnout. However there were also some unique predictors, with lack of support and behavioural disengagement predicting burnout only. Significant predictors are discussed below and consideration is then given as to why some hypothesised predictors were non-significant.

Emotional empathy.

High emotional empathy significantly predicted both STS and burnout, indicating that nurses who experience strong emotions as part of the empathic process are more likely to experience STS and burnout. However it was the strongest predictor for the former, which is consistent with STS's focus on empathic engagement.

Regarding STS, the results support Figley's (1995; 2002) suggestion that empathy is the conduit through which trauma becomes transmitted to the professional.

However the other element of emotional empathy (fantasy) was only significant in bivariate correlations whilst the cognitive element of empathy (perspective-taking) was non-significant. This suggests that understanding another's perspective does not place nurses at risk of STS unless they experience a strong emotional response. This supports previous research which identified that emotional rather than cognitive empathy is associated with STS (Crumpei & Dafinoiu, 2012; Robins et al., 2009) and is consistent with Conrad (2004) who suggested that in feeling the emotional pain of others, professionals becomes vulnerable to the negative effects associated with the emotion. Consequently, empathy can be viewed as a double-edged sword (Robins et al., 2009) whereby it is essential to clinical practice but certain elements increase nurses' risk of STS.

Like STS, personal distress was the only aspect of empathy to significantly predict burnout, which is consistent with previous research (Crumpei & Dafinoiu, 2012; Omdahl & O'Donnell, 1999; Robins et al., 2009). Emotional empathy has been found to particularly predict the MBI subscale, emotional exhaustion (Omdalh & O'Donnell, 1999). This suggests that regularly experiencing an emotional response to patients is likely to result in nurses becoming emotionally drained and they are therefore unlikely to sustain this level of emotional engagement without burning out.

Consequently, emotional empathy has two effects on nurses, it firstly appears to make them vulnerable to experiencing trauma symptoms via the experience of others' negative emotions, and secondly, it appears to drain them of emotional energy, resulting in burnout.

Current life stress.

Current life stress was a significant predictor of both STS and burnout. This is consistent with previous research in STS (Abendroth & Flannery, 2006; Meadors & Lamson, 2008) and burnout (Adams et al., 2006; Adams et al., 2008; Demir et al., 2003; Dyrbye et al., 2011; Dyrbye et al., 2006).

Given that both conditions have been conceptualised as extreme stress responses (Bomyea et al., 2012; Payne, 2001) it is likely that personal stressors in addition to exposure to work-related trauma or work stressors place too much strain on nurses, resulting in STS and burnout. For example, nurses who are experiencing personal difficulties may find themselves less able to cope with difficulties in work than they would usually be, which 'tips' them over into STS and burnout. This is consistent with Meadors and Lamson's (2008) findings which suggested that nurses with high personal stress did not perceive they had sufficient resources to manage both home and work stressors. This also maps onto literature regarding primary trauma where life stressors are suggested to increase the likelihood of PTSD developing following a traumatic event as they weaken individuals' defenses (Schiraldi, 2000). However, these results should be interpreted cautiously as whilst nurses were instructed to complete the PSS in relation to their home lives only, some may have included work-related stress in their answers. Nevertheless this continues to suggest that nurses experiencing high levels of stress are vulnerable to STS and burnout.

Social support.

Low social support significantly predicted burnout only, suggesting nurses who perceive themselves to lack support from colleagues are more vulnerable to developing burnout. This is consistent with previous research in nursing (Barnard et al., 2006; Boyle et al., 1991; Kilfedder et al., 2001; Oehler & Davidson, 1992; Oehler et al., 1991; Townsend & Campbell, 2009). It is possible that social support provides an opportunity to express emotion, share coping strategies and seek advice (Kilfedder et al., 2001), which increases the resources available to nurses to manage stress, which may reduce the likelihood of burnout. Furthermore, it is likely that co-workers provide effective support as they are able to understand and validate other nurses' distress and offer advice based on their experience and knowledge of the area.

A lack of support was significantly correlated with STS but became non-significant when other variables were taken into account. This was unexpected given a lack of co-worker support has been associated with STS in other professionals (Bonach &

Heckert, 2012; Bride et al., 2007; Townsend & Campbell, 2009). Potentially with more power, a significant relationship may have been identified. However the results are consistent with Figley's (1995; 2002) model which did not include social support, and it is possible that whilst it has some benefits, they are minimal when in the presence of other factors. Anecdotal evidence also suggests that nurses do not wish to be seen as being distressed by their work for fear it signals an inability to cope with their role. It is therefore possible that for managing burnout symptoms, which are well-known and to some extent, expected with nursing, utilising social support might be more acceptable. However for trauma symptoms, which are less well publicised, nurses may feel unable to access their usual supports, making it a lesser relied upon resource. Similarly, nurses may also feel more proficient in providing support around burnout but less familiar with giving advice around STS, making the support less useful.

Coping styles.

Behavioural disengagement was the only significant coping style to predict burnout and is characterised by giving up attempts to deal with difficulties. It has been associated with several negative outcomes including increased job stress in teachers (Griffith, Steptoe, & Cropley, 1999) and burnout in nurses and genetic counsellors (Shimizutani et al., 2008; Udipi et al., 2008). There are several possible explanations for why behavioural disengagement predicts burnout. Firstly, giving up attempts to cope may impede nurses from engaging in more adaptive coping strategies (Carver, 1989). Secondly, Griffith et al. (2009) suggest that giving up attempts to deal with stressors may result in a build-up of work. This may then be appraised negatively and further increase stress levels, resulting in a vicious circle, culminating in burnout. Lastly, burnout also incorporates a decreased sense of accomplishment in one's job (Maslach, 1982; Stamm, 2010) and potentially if nurses give up attempting to cope with stressors, they are unlikely to feel accomplished.

With regard to the remaining coping styles, a variety of emotion-focused coping styles were positively correlated with STS and burnout. These comprised self-distraction; venting; humour; substance misuse; and self-blame. Additionally, STS

was positively correlated with positive reframing; acceptance; and religion. This is broadly consistent with the suggestion that emotion-focused coping styles tend to be associated with poorer outcomes (Gurung, 2010) and is consistent with previous research on burnout in nursing (Ben-Zur & Michael, 2007; Boyle et al., 1991; Ceslowitz, 1989; Payne, 2001). Surprisingly, some problem-focused styles such as active coping, planning and use of instrumental support were also positively associated with STS and burnout. When entered into regression, both active coping and instrumental support became negatively related to STS and burnout, and whilst the results were non-significant, this suggests they become more helpful when taking into account other factors. However, planning continued to have a positive, although non-significant, relationship with both STS and burnout. This has been found in previous research with hospice nurses (Payne, 2001) and is possible that the utility of problem-focused styles is context dependent. For example, planning may not be particularly helpful in terminal cases as little can be done to resolve the problem. Indeed, futile attempts to prolong life are considered distressing by nurses (Yoder, 2010). Nonetheless, like most coping styles, planning did not reach statistical significance in regression. Again it is difficult to suggest whether coping styles are less influential on the development of STS and burnout when taking into account other factors or whether their lack of significance reflects insufficient power. Further research with a larger sample is therefore needed to clarify this.

Organisational stressors.

Organisational stressors were hypothesized to predict burnout only. Several positively correlated with burnout but became non-significant when entered into regression. These comprised conflict with physicians, conflict with other nurses, and workload. Both conflict with physicians and other nurses have previously been associated with burnout (Duquette et al., 1995; O'Mahony, 2011; Payne, 2001; Poncet et al., 2007; Watson & Feld, 1996), as has workload (Duquette et al., 1995; Galindo et al., 2012; Maytum et al., 2004; O'Mahony, 2011; Watson & Feld, 1996; Yoder, 2010). It is therefore surprising that they were not significant predictors, however the majority of previous studies focused on organisational stressors alone and did not take individual factors into account. Consequently, it is possible that whilst organisational stressors are associated with increased burnout, it is not the

stressors themselves which directly result in burnout but the combination of other individual factors such as coping, empathy, support and life stress which affect how the stressors are appraised and responded to.

Exposure to work-related trauma.

This is the first study to measure exposure to work-related trauma in terms of perceived exposure to death, dying and patient suffering in addition to more indirect methods such as length of experience. In keeping with the literature, years experience (both in terms of years qualified and years in post) was not significantly associated with STS however exposure to death and dying was positively correlated. This suggests that the latter method of measuring work-related trauma is more sensitive than years experience and supports the suggestion that such exposure increases the likelihood of STS developing. However it was not a significant predictor. This may relate to a lack of power but it likely indicates that whilst exposure to work-related trauma has some effect, individual factors, such as empathy and current life stress, determine whether STS develops.

It is also notable that exposure to death and dying was not significantly associated with burnout. This is consistent with the two constructs' differential focus on traumatology, whereby exposure to trauma is a major tenant of Figley's (1995) model of STS, whereas burnout focuses on broader organisational stressors.

Personal trauma history.

Lastly, personal trauma history was investigated in relation to STS but no significant association was found. This is the first study to investigate this in nurses but the results are consistent with research from other health and social care professionals which also failed to find a significant relationship (Adams et al., 2006; Adams et al., 2008; Boscarino et al., 2004; Creamer & Liddle, 2005; Devilly et al., 2009; Follette et al., 1994; Ortlepp & Friedman, 2002; Rossi et al., 2012). Given that current life stress was a significant correlate and predictor of STS, it is possible that proximal events have greater influence on the development of STS, as found by previous research (Adams et al., 2006; Follette et al., 1994; Rossi et al., 2012). However the lack of significant results in this study may also relate to the

nature of the trauma history as some studies have found an association when the trauma history and work-related trauma were similar (Jenkins & Baird, 2002: MacRitchie & Leibowitz, 2010; Nelson-Gardnell & Harris, 2003). Consequently, it is possible that the nurses' trauma histories were too dissimilar to the work-related trauma to trigger difficult memories. For example, the TEQ includes events such as rape or natural disasters, whereas nurses tend to be exposed to medical events such as the death of a child. Whilst the TEQ allows participants to enter their own event, too few had experienced medical-related events to analyse whether this affected STS. Alternatively, trauma history may have been under-reported due to the sensitive nature of the information. Nevertheless, on the basis of these results, a generic history of trauma does not appear to increase paediatric nurses' vulnerability to STS.

Summary of predictors.

In summary, both STS and burnout were associated with a range of organisational and individual factors. However the only ones to significantly predict STS were emotional empathy and current life stress, whilst burnout was also predicted by both of these in addition to a lack of support and behavioural disengagement. This demonstrates some overlap in predictors, suggesting that empathic style and current life stress are key to negative outcomes, making them particularly important to target to reduce the prevalence of work-related conditions in paediatric nurses. Conversely, a lack of support and behavioural disengagement predicted burnout but not STS, which is consistent with their theoretical models, whereby STS does not emphasise social support or coping styles. Lastly, whilst STS is associated with work-related trauma, and burnout is associated with organisational stressors, these were non-significant when taking other factors into account. This suggests that it is the combination of individual factors which determines whether paediatric nurses develop STS and burnout, rather than exposure to environmental stressors alone.

Relationship between STS, burnout and CS

The results indicated that STS and burnout were positively correlated, which is consistent with previous findings (Alkema et al., 2008; Simon et al., 2005; Slocum-

Gori et al., 2013). It was hypothesised that the proportion of nurses experiencing STS and burnout would differ, however the levels were similar with 20.2% in the high range for STS and 21.7% in the high range for burnout. Previous studies have reported that whilst a large proportion of nurses experience burnout, only a small proportion experience trauma symptoms (Mealer et al., 2007). However they used a PTSD measure, which has higher cut-offs compared to STS measures, which may explain why they found a smaller proportion of nurses with trauma symptoms compared to the present study.

The results also suggested that whilst burnout had a strong, negative association with CS, the relationship between STS and CS was non-significant. This indicates that nurses with high CS have low burnout, but the relationship does not appear to function in the same way for STS. This is similar to the findings of previous research which found a stronger relationship between CS and burnout than with STS (Alkema et al., 2008; Simon et al., 2005; Slocum-Gori et al., 2013). Given CS is arguably a measure of job satisfaction, which has been negatively associated with burnout in nursing (Rosales, Labrague, & Rosales, 2013), it is unsurprising that CS and burnout are negatively related. That is, if nurses are content in their job, they are less likely to feel burnt out and vice versa. STS however has a greater focus on empathic engagement and traumatology and so CS may not be as directly linked. For example, nurses may develop a good relationship with patients using empathy, which may provide satisfaction, but they might also experience symptoms of STS as a result of this engagement, making the relationship between CS and STS less straightforward.

Clinical Implications

Over half the paediatric nurses in this study reported moderate symptoms of STS and burnout, with just over 20% in the high range for each condition. Such high levels of STS and burnout may be problematic for several reasons. Firstly, symptoms of these conditions are unpleasant and in some cases, can reach clinically high levels. For example, a small proportion of nurses report trauma levels consistent with PTSD (Czaja et al., 2012; Mealer et al., 2009). Whilst this

was not measured in this study, it is possible that a small subsection of paediatric nurses with high levels of STS could be at risk of developing PTSD.

Further to this, it is unlikely that nurses who experience symptoms of STS and burnout will wish to remain in a role which adversely affects their well-being. Indeed, burnout and STS have been associated with intention to leave one's profession (Bride et al., 2007; Poncet et al., 2007). This may result in staff shortages (which could impact on the remaining nurses' stress levels, further perpetuating burnout) and has financial implications for the NHS given nurses are expensive to train. Furthermore, nurses who are experiencing symptoms of STS and burnout are potentially less likely to be as empathic and sensitive to their patients' needs as they would normally be, which has implications for patient care. For example, burnout has been negatively associated with patients' satisfaction with care (Garman, Corrigan, & Morris, 2002; Vahey, Aiken, Sloane, Clarke, & Vargas, 2004). Notably the Francis Report (2013) recently highlighted how poor quality care can lead to serious consequences for patients. Whilst it is not possible to suggest that the problems identified in Mid Staffordshire NHS Foundation Trust are the result of conditions such as STS or burnout, it seems possible that they may contribute to a lack of compassionate care. For example, burnout is characterised by depersonalisation which suggests that nurses may feel emotionally detached from others, which may help explain some of the indifference shown to patients and their families described in the report. STS and burnout may therefore have an impact on a number of levels, the nurses, the patients and the organisation, suggesting action needs to be taken to reduce these conditions. Potential options for this are discussed below.

Given emotional empathy and current life stress are predictors of both conditions, these are likely to be key areas for intervention. Empathy is an important element of compassionate care (Department of Health [DH], 2012) and given this is being strongly promoted within the health care sector (DH, 2013a; DH, 2013b; Francis, 2013), it seems particularly timely for nurses to receive more in-depth training around empathic styles. This could be aimed at enabling them to provide good quality care but also to be mindful of their own well-being. For example, emphasis could be placed on increasing the use of cognitive empathy, which was not

associated with negative outcomes in this study, and in some cases, has been suggested to be protective (Robins et al., 2009). Additionally, increased support to manage the negative effects of emotional empathy may also be helpful. Mindfulness might be a promising intervention given this approach helps individuals to avoid becoming 'caught up' in thoughts and emotions (Kabat-Zinn, 1990).

It may also be helpful for nurses to receive training to recognise STS and burnout symptoms and in stress management techniques, particularly as such techniques can be used in the workplace but also transferred to personal stressors. There is some existing support for this with seminars on the above topics improving awareness of STS and increasing confidence in managing symptoms (Meadors & Lamson, 2008). Similarly, mindfulness programmes have been found to reduce nurses' burnout symptoms and improve life satisfaction (Mackenzie, Poulin, & Seidman-Carlson, 2006). However, whilst one-off training sessions might be useful, particularly for HCAs, it might be more beneficial if undergraduate nursing courses had an increased focus on self-care, which would equip nurses with the necessary skills to manage the emotional impact of their work for the duration of their careers.

Additionally, a lack of support from colleagues also predicted burnout and so hospitals may benefit from considering ways of facilitating social support. For example, it may be useful to review whether nurses have sufficient clinical supervision to discuss cases, reflect upon emotions and seek advice, which has been suggested to be beneficial (Baird & Kracen, 2006). Reflective practice groups have also been found to be effective by mental health nurses (Olofsson, 2005) and implementing them in medical health settings may provide nurses with a space to consider the impact of their work, share coping strategies and normalise their experiences. Additionally, less experienced nurses may benefit from a mentor from whom they can seek informal support (Block, Claffey, Korow, & McCaffrey, 2005).

Lastly, the relationship between STS and CS was non-significant. Worryingly, this suggests paediatric nurses who are satisfied by their work are still at risk of STS,

indicating that hospital managers need to be mindful that seemingly satisfied nurses may also require support.

Limitations and recommendations for future research

Whilst the results have identified a range of factors which predict STS and burnout, the study had several limitations. Firstly, the relatively low number of participants meant that there was insufficient statistical power, increasing the likelihood of type II errors. However this does not detract from the significant predictors identified. Furthermore, given this was exploratory research, it was considered more helpful to include all hypothesised variables rather than losing information through data reduction techniques, for which the sample size was also insufficient. It is also important to note that the Malahanobis distances for multivariate outliers were above 15 in half the cases for both the STS and burnout models. This suggests that they may have had extra leverage on the models, and so caution should be taken when generalizing the results to other samples. Further research is therefore needed with a larger sample to confirm the results found in this study and to investigate whether other potential predictors may be significant given sufficient power.

Secondly, marital status and hardiness have also been associated with burnout (Boyle et al., 1991; Wright, Blache, Ralph, & Luterman, 1993) however they were not included in this study as there were already several factors being investigated and there was not sufficient power to include further variables. Furthermore, a hardiness questionnaire would have increased the time burden on the participants. Nevertheless, future research may wish to consider including hardiness to investigate whether personality factors are influential in the presence of the predictors identified in this study.

Thirdly, the ProQOL-IV is a screening measure and consequently it tends towards type I errors and so it is possible that the levels of STS and burnout are over-estimated. However as one of the most well used measures in the literature, it was considered appropriate for use in this study. Furthermore, it is possible that nurses experiencing high distress were keen to participant in the study due to its relevance to them, potentially introducing bias into the sample. On the other hand, those with

high burnout levels may not have had the energy to participate, suggesting the levels reported may also be an under-estimate.

Additionally, whilst the NSS captures a variety of organisational stressors, it was designed in America and it is possible that stressors which are relevant to the NHS as a publically funded healthcare system may not have been sufficiently measured. For example, the NHS is associated with pressure to reduce waiting lists, a lack of funding and inadequate staffing levels (Royal College of Nursing, 2013) and so further research may wish to consider these in more detail. Also, it is unclear as to what degree STS and burnout have an effect on the everyday functioning of nurses in both their personal and work lives. It may therefore be useful for future research to consider measuring functioning along with other correlates such as depression.

Lastly, longitudinal research is needed to identify the course of STS and burnout. For example, nurses who experience high STS and burnout may leave nursing prematurely and so it would be helpful to identify the factors which influence this compared to those who remain in the profession. It is also possible the nurses experiencing high levels of STS and burnout may consequently have a lower threshold for personal stressors. Therefore, current life stress may be a result rather than a cause of these conditions and longitudinal research would help clarify causation.

Conclusion

This is the first study to investigate predictors of both STS and burnout in paediatric nurses specifically. The results indicate that these conditions are prevalent within this population but do not suggest that paediatric nurses from particular departments are more at risk than others. Indeed, the main risk factors appear to be a combination of individual factors, with emotional empathy and current life stress predicting both STS and burnout, whilst burnout was also predicted by a lack of support and behavioural disengagement. Given the levels of STS and burnout identified, hospitals would benefit from considering additional training to support their nursing staff.

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Appendix 1: Stages of identifying empirical studies for inclusion