Burnout, Post-traumatic Stress, and Coping Strategies in Oncology, and the Relationship with Psychological Flexibility

1. **Systematic Literature Review**

   Burnout in Oncologists and Associated Factors:
   A systematic literature review and meta-analysis

2. **Empirical Study**

   Burnout in Paediatric Oncology Staff and the Relationship with Traumatic Stress, Psychological Flexibility, and Coping Strategies

3. **Reflective Piece**

   Reflections on a Large Scale Research Project

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May 2018

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Abstract

While often rewarding, working in oncology can be a demanding job. Staff work with patients who are acutely unwell and often experiencing considerable suffering. Oncology staff appear to be vulnerable to burnout and post-traumatic stress. This has negative implications for oncology staff, patient safety, and service provision. This thesis explores burnout and post-traumatic stress symptoms in oncology staff and their associated factors.

The systematic literature review and meta-analysis (Paper 1) explores levels of burnout and associated factors in oncology physicians. The author assessed 27 studies that utilised the Maslach Burnout Inventory (MBI) tool to measure burnout. Pooled rates of burnout were calculated via meta-analysis. Twenty of the studies reported factors found to be significantly associated with high levels of burnout. These findings are discussed in more detail.

The empirical study (Paper 2) examines rates of burnout in paediatric oncology staff. In addition, participants completed a screening tool to highlight post-traumatic stress symptoms. Associations between these factors and the Acceptance and Commitment Therapy (ACT) constructs of psychological flexibility and experiential avoidance are explored, as are the relationships with personal and organisational coping strategies. The findings suggest a significant proportion of the paediatric oncology staff were experiencing burnout. Statistical analysis demonstrates that higher levels of burnout and post-traumatic stress symptoms correlate with staff that show less psychological flexibility and more experiential avoidance. This suggests that frameworks that increase psychological flexibility could prove to be an effective intervention to reduce burnout and risk of post-traumatic stress in paediatric oncology staff.

The final paper (Paper 3) provides critical reflection of the author's research process. This includes a discussion of the decisions behind the systematic literature review and empirical study, as well as the methods, challenges, and learning.

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Burnout in Oncologists and Associated Factors: A systematic literature review and meta-analysis

Paper 1 Abstract

Introduction

Oncologists may be particularly at risk of burnout. This systematic literature review and meta-analysis explores levels of burnout and associated factors in oncologists.

Methods

The author assessed 27 studies that utilised the Maslach Burnout Inventory (MBI) tool to measure burnout. Pooled rates of burnout were calculated via meta-analysis (MetaXL) using random effects models.

Results

Approximately 5803 oncologists provided burnout data. A significant number experience burnout. Pooled rates of burnout for MBI subscales were: emotional exhaustion at 36%; depersonalisation at 28%; and low personal accomplishment at 37%. Twenty of the studies reported factors found to be significantly associated with high levels of burnout. These were grouped into demographic differences, individual factors and work factors.

Conclusion

Burnout is associated with workplace demands and poor well-being. This has significant negative implications for oncology physicians and patient safety. Further insight into individual factors, and factors associated with lower burnout would be beneficial.

Introduction

Working in healthcare can be highly demanding. Long hours and caring for individuals with complex needs can leave healthcare workers physically, psychologically, and emotionally drained. Research has provided ample evidence for the high prevalence of burnout among healthcare professionals (Hall, Johnson, Watt, Tsipa, & O'Connor, 2016). Burnout can be viewed as a psychological syndrome where occupational stresses lead to an individual's relationship with their work becoming debilitating and emotionally fatiguing (Portoghese, Galletta, Coppola, Finco, & Campagna, 2014). While there have been differing views on the definition of burnout, Maslach and Jackson's (1981) definition is used extensively across the world. They propose a three-factor understanding of burnout. Firstly, emotional exhaustion (EE), which describes experiencing a fatigued emotional response. Secondly, depersonalisation (DP), which refers to developing a distant, impersonal response, and a negative attitude to those to whom you are providing a service. The model theorises that as a worker's exhaustion intensifies and empathy declines, the third factor, a low sense of personal accomplishment (low PA) follows (Maslach & Leiter, 2016). Low PA denotes a sense of incompetence and negative self-evaluation (Maslach & Jackson, 1981). The culmination of this work is the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981), which is considered the gold standard in burnout measurement (Schaufeli & Taris, 2005), and has become the tool used in the vast majority of research in the area.

Burnout, Healthcare, and Oncology

While many aspects of caring for patients with cancer can be rewarding (Shanafelt & Dyrbye, 2012), oncology care professionals experience patients going through considerable suffering and often death and therefore may be particularly at risk of burnout. Significant rates of burnout have been demonstrated in oncology nurses (Gómez-Urquiza et al., 2016; Martins Pereira, Fonseca, & Sofia Carvalho, 2011) and oncology doctors (the focus of this review).

Combating burnout is essential to improving patient care and worker satisfaction, but also to reducing the financial loses of healthcare systems such as the NHS. Errors in NHS healthcare settings cost the UK taxpayer around £2 billion in extra care provision and approximately £1.3 billion in litigation pay-outs (Department of Health, 2000; Hall et al., 2016). While a number of different factors contribute to these figures, research suggests that even moderate levels of

burnout are associated with a reduction in patient safety and an increase in medical errors (Hall et al., 2016).

Burnout is a significant predictor of short-term absences due to sickness (Anagnostopoulos & Niakas, 2010). Burnout also has implications for staff retention, with oncology physician desire to quit, change speciality, reduce hours, or retire early all being found to be associated with burnout (Blanchard et al., 2010a; Elit, Trim, Mand-Bains, Sussman, & Grunfeld, 2004; Probst, Griffiths, Adams, & Hill, 2012b). The latest Clinical Oncology UK workforce census (The Royal College of Radiologists, 2017) shows significant shortages of oncology staff and a rising number of vacant positions. Concerns are also reported in the United States, with a predicted 48% increase in oncology service demand between 2005 and 2020 (Erikson, Salsberg, Forte, Bruinooge, & Goldstein, 2007). Combined with the more than three percent increase in cancer prevalence each year (Cancer Research UK, 2014), this highlights the increasing impetus to understand and reduce burnout in oncology physicians.

To the author's knowledge, this is the first systematic literature review of oncology physicians to focus specifically on all three subscales of burnout as measured by the MBI and their associated factors. One review has explored this area, but concerning the prevalence of high EE scores only (Medisauskaite & Kamau, 2017).

Aims

The author aims to review the literature on burnout in physicians working in oncology. More specifically, the aim of the review is to address the following research questions:

1. What is the prevalence of burnout in oncology physicians?
2. What factors are associated with burnout in oncology physicians?

Method

The Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) recommendations (Moher et al., 2015) guided the structure of this review. An initial search of the literature informed the creation of the eligibility criteria and relevant search terms.

Eligibility Criteria

Studies included in the review were those published in English, quantitative, and providing physician-specific data. To assist comparison, only those that used the MBI tool, considered to be the gold standard in burnout measurement (Schaufeli & Taris, 2005), were included. Abstracts, unpublished data, and data shared at conferences were not included. Where studies used mixed methods, only quantitative data was considered. If two time points were recorded, for example where an intervention was trialled, the data from the first time point was recorded unless otherwise specified.

Information Sources and Literature Search Strategy

The author conducted a comprehensive search of the following databases: PsychINFO, Medline, CINAHL, and Web of Science. Search terms were: burnout – professional; burnout – psychological stress; oncology – physician; oncology – doctor; and Maslach.

The searches from the four databases were combined in referencing management software, Mendeley Desktop© and duplicates removed. Initial screening of the abstracts was followed by reading the full texts and removing papers that did not meet the eligibility criteria (see Figure 1).

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Figure 1. Search and screening process.

Evaluation of Study Quality and Meta-Analysis

The Joanna Briggs Institute Critical Appraisal Tools for use in JBI Systematic Reviews: Checklist for Prevalence Studies (Munn, Moola, Lisy, Riitano, & Tufanaru, 2015) was used as a quality tool (see Appendix 1). The tool is validated for assessing the methodological quality of studies presenting prevalence data in systematic reviews (Munn, Moola, Riitano, & Lisy, 2014). The appraisal tool enables studies to be scored based on nine questions, answering each as "Yes," "No," "Unclear," or "Not Applicable." In this review, quality scores ≤ 4 were rated as low quality, 5-7 were rated as moderate quality, and ≥ 8 were rated as high quality (see Table 1). Inter-rater reliability score agreement was conducted by comparing the author and a researcher independent to the study scoring of "Yes"= 1 vs. "No", "Unclear", or "Not Applicable"= 0. NICE guidance (NICE, 2012) advises that a minimum of 10% of studies be evaluated by both raters. As such, six (22%) randomly selected studies were double-assessed. Cohen's Kappa for each question ranged from 0.571 (p=0.121) – 1.0 (p=0.014), with an average high strength of agreement k = 0.857, which was statistically significant (p<0.05). No studies fell in the low category, and as only a limited number of relevant studies were found in the review, no studies were excluded as a result of their quality rating. However, the ratings guided the author's interpretations of the results.

Meta-analysis was conducted to assess the prevalence of high scores of EE, DP, and low PA across the studies reviewed. An add-on extension for Microsoft Excel, MetaXL (Barendregt & Doi, 2016) was used to conduct the analysis using random effects models (double arcsine transformation).

Table 1. Quality ratings of studies.

First Author	Year	Quality Tool Score	Rating
Alacacioglu	2009	5	Moderate
Balbay	2011	6	Moderate
Banerjee	2017	9	High
Bar-Sela	2012	5	Moderate
Blanchard	2010	9	High
Bragard	2010	9	High
Bragard	2012	9	High
Bressi	2008	9	High
Catt	2005	7	Moderate
Cubero	2015	6	Moderate
Demirci	2010	5	Moderate
Diggens	2014	5	Moderate
Eelen	2014	7	Moderate
Elit	2004	8	High
Glasberg	2007	6	Moderate
Grunfeld	2000	7	Moderate
Leung	2017	8	High
Liakopoulou	2008	6	Moderate
Mampuya	2016	8	High
Probst	2012	6	Moderate
Ramirez	1995	9	High
Ramey	2017	7	Moderate
Roth	2011	8	High
Shanafelt	2014	9	High
Singh	2016	7	Moderate
Taylor	2005	8	High
Travado	2005	7	Moderate

The Maslach Burnout Inventory Measure

While the number and wording of question items, the subscales, and the scoring of the MBI have remained the same, the way it has been used to classify burnout has evolved. Initially, the authors defined the criteria for burnout as high levels of EE and DP, in combination with low PA (Maslach & Jackson, 1981). The authors advised against using the tool as a dichotomous burnout/no burnout measure. However, in response to researchers' and clinicians' requests, Maslach and colleagues (Maslach, Jackson, & Leiter, 1996; Maslach, Jackson, Leiter, Schaufeli, & Schwab, 1986) later delineated low, medium, and high burnout cut-offs (Maslach et al., 1986). The most recent fourth edition of the measure has returned to viewing each subscale score (EE, DP, low PA) as an absolute value which can be compared to the score of others and is not categorised as low, medium, or high (Maslach, Jackson, Leiter, Schaufeli, & Schwab, 2017). Further analysis of the MBI has led researchers to suggest that high EE and high DP alone are the core components of burnout. Taris and colleagues (2005) tested three process models to assess causal relationships between the three subscales of the MBI and found that higher levels of EE resulted in higher levels of DP. Schaufeli and colleagues (2001) carried out multi-group confirmatory factor analyses on the MBI. They found that while all the items of

the MBI loaded significantly on to all three subscales for burned out workers, six items on the low PA subscale failed to differentiate between burned out and non-burned out workers. Therefore, high levels of either (EE or DP) are sufficient to detect burnout (Schaufeli, Bakker, Hoogduin, Schaap, & Kladler, 2001; Taris, Le Blanc, Schaufeli, & Schreurs, 2005a).

Results

Population and Study Characteristics

Initial searches identified 40 studies, of which 21 were included in the review. A further six studies obtained through other sources brought the total to 27 (see Figure 1). The studies were conducted across 20 different countries, with five involving participants from multiple countries. Around 50% of the studies used participants from Europe, 14% from Oceania, 32% from the Americas, and 21% from Asia. From these locations, approximately 5803 oncology physicians provided burnout data. The vast majority of the studies were cross-sectional (N = 23); two provided an intervention (Bar-Sela, Lulav-Grinwald, & Mitnik, 2012; Bragard, Dupuis, Razavi, Reynaert, & Etienne, 2012); while a further two were longitudinal (Cubero et al., 2016; Taylor, Graham, Potts, Richards, & Ramirez, 2005). Professions included as participants in the studies varied between papers. For example, some included all oncology staff, while others focused specifically on oncology physicians. The studies in this review were only included if the researchers provided oncology physician-specific burnout data. Publication years ranged from 1995-2017. The sample sizes of physicians ranged from 16-1490, with five of the studies having modest sample sizes N = <40. Six studies had sample sizes of N = 50-99, nine studies N = 100-200, and seven studies N = >200, see Table 2 for details. Appraisal of the studies using the quality tool found none of the studies were rated as low quality, 15 were rated as medium quality, and 12 as high quality (see Table 1).

Methodological approaches regarding population sample used and participant recruitment varied. Three studies (Alacacioglu, Yavuzsen, Dirioz, Oztop, & Yilmaz, 2009; Bar-Sela et al., 2012; Diggens & Chesson, 2014) were limited to recruiting from one hospital. Eighteen studies attempted to contact high proportions of the oncology physician population, e.g., through national groups, professional registration contact lists, or contacting all oncologists within a country. The majority of MBI questionnaires were distributed through post, email, or via institutional department heads. One was conducted face-to-face (Balbay, Isikhan, Balbay, Annakkaya, & Arbak, 2011), and one approached participants through advertisement (Travado, Grassi, Gil, Ventura, & Martins, 2005).

Table 2. Studies included in the review.

First Author	Year	Country	Journal Impact Factor	Survey	No of Oncology Physicians	Physician Type Included
Alacacioglu	2009	Turkey	3.10	Cross-sectional	77	Medical Oncologists, Internists, Radiation Oncologists
Balbay	2011	Turkey	NL	Cross-sectional	137	Oncology Physicians
Banerjee	2017	Europe	11.86	Cross-sectional	737	Young Oncologists
Bar-Sela	2012	Israel	1.33	Longitudinal, intervention	17	Oncology Residents
Blanchard	2010	France	6.03	Cross-sectional	204	Medical Oncology Residents, Radiation Oncology Residents, Haematology Residents
Bragard	2010	Belgium	1.33	Longitudinal, intervention	62	Cancer Care Specialists
Bragard	2012	Belgium	1.44	Cross-sectional	113	Cancer Care Medical Residents
Bressi	2008	Italy	6.18	Cross-sectional	121	Haemato-oncology Physicians
Catt	2005	UK	5.57	Cross-sectional	100	Medical Oncologists, Radiation Oncologists, Oncology Surgeons
Cubero	2015	Brazil	1.33	Longitudinal	54	Oncology Residents
Demirci	2010	Turkey	2.63	Cross-sectional	37	Oncology Physicians
Diggens	2014	Australia	NL	Cross-sectional	130	Radiation Therapists
Eelen	2014	Belgium	3.10	Cross-sectional	77	Medical Oncologists, Radiotherapists, Other Oncology Specialists
Elit	2004	Canada	4.96	Cross-sectional	39	Gynecologic Oncologists
Glasberg	2007	Brazil	0.93	Cross-sectional	102	Medical Oncologists
Grunfeld	2000	Canada	6.80	Cross-sectional	121	Medical Oncologists, Clinical Associates
Leung	2017	Australia, New Zealand	1.19	Cross-sectional	107	Radiation Oncology Trainees
Liakopoulou	2008	Greece	2.70	Cross-sectional	16	Paediatric Oncology Physicians
Mampuya	2016	Japan	1.79	Cross-sectional	87	Radiation Oncologists
Probst	2012	UK	2.05	Cross-sectional	87	Radiotherapists
Ramirez	1995	UK	6.18	Cross-sectional	393	Medical Oncologists, Clinical Oncologists, Palliative Care Specialists
Ramey	2017	USA	2.57	Cross-sectional	205	Radiation Oncology Residents

Table 2. Studies included in the review.

First Author	Year	Country	Journal Impact Factor	Survey	No of Oncology Physicians	Physician Type Included
Roth	2011	USA, Canada, Australia, Belgium, Denmark, Finland, Iceland, Israel, Netherlands, Norway, Sweden, New Zealand, UK	2.51	Cross-sectional	410	Paediatric Oncologists
Shanafelt	2014	USA	24.01	Cross-sectional	1490	Oncology Physicians
Singh	2016	Australia, New Zealand	1.19	Cross-sectional	35	Radiologists
Taylor	2005	UK	44.00	Longitudinal	724	Surgical Oncologist, Clinical Oncologist, Medical Oncologists
Travado	2005	Italy, Portugal, Spain	3.10	Cross-sectional	121	Oncology Physicians

NL=Impact factor not listed

Statistical Methods

Variability of burnout by demographics was generally analysed using bivariate statistical methods such as T-test, chi-squared and Fisher's exact test. Bivariate correlations were measured using Pearson's r or Spearman's rho. Multivariate regression analysis was conducted in 11 of the studies.

Methods of Reporting Maslach Burnout Inventory Data

Five main methods of reporting burnout data were utilised in different combinations: the original classification of MBI burnout as high EE and high DP combined with low PA; the more recent classification of high EE or high DP, or either of the three subscales; overall burnout scores/rates; presentation of one, two, or three of the individual subscale scores; mean scores; and proportion of low, medium, or high rates of the three subscales.

Rates of Oncology Physician Burnout

Ten of the studies included participants other than oncology physicians e.g. nurses and healthcare assistants (Alacacioglu et al., 2009; Balbay et al., 2011; Bressi et al., 2008; Catt, Fallowfield, Jenkins, Langridge, & Cox, 2005; Demirci et al., 2010; Eelen et al., 2014; Grunfeld et al., 2000; Liakopoulou et al., 2008; Singh et al., 2016; Taylor et al., 2005). Of these, two studies (Singh et al., 2016; Taylor et al., 2005) focused on physicians but included specialisms other than oncology. As such, the author extracted the necessary oncology physician data from the studies to perform the meta-analysis calculation presented in this review (see Table 3 and Figures 2-4). In circumstances where oncology physician-specific burnout data was not present, the studies were excluded from the review (see Figure 1).

Seventeen of the studies provided prevalence rates of high scores on all three subscales (EE, DP, low PA). One (Blanchard et al., 2010a) showed just EE and DP. Two (Bragard et al., 2012; Taylor et al., 2005) showed just EE. Seven (Balbay et al., 2011; Bar-Sela et al., 2012; Bragard et al., 2010; Demirci et al., 2010; Leung & Rioseco, 2017; Liakopoulou et al., 2008; Probst, Griffiths, Adams, & Hill, 2012a) did not provide specific data on the prevalence of high subscale scores. However, apart from Leung & Rioseco (2017), six of these did provide mean scores for all three of the subscales (EE, DP, low PA), see Table 3.

Initial meta-analysis showed that pooled prevalence rates of oncology physicians with high scores in each subscale were as follows: emotional exhaustion at 36%; depersonalisation at 28%; and low personal accomplishment at 37%, see forest plots (Figures 2-4). However, all three subscales were found to show a high level of heterogeneity. EE at p<0.0001; Q=299.52 with inconsistency (I2) of 94% (95% CI 92-95); DP at p<0.0001; Q=601.35 with I2 of 97% (95% CI 96-98); low PA at p<0.0001; Q=767.68 with I2 of 98% (95% CI 97-98).

Sensitivity analysis was conducted to investigate possible sources of heterogeneity. Firstly, outlier data was present on the MBI subscales for Singh and colleagues (2016), and Alacacioglu and colleagues (2009). The former showed the greatest number of participants with high EE (100%) and high DP (97%) while the latter showed the lowest number of participants with high EE (7.8%) and the greatest number of participants with low PA (100%), see Table 3 and Figures 2-4. However, excluding these studies resulted in only small changes in pooled prevalence, and heterogeneity remained high: EE at 34% with I2 of 89% (95% CI 85-93); DP at 25% with I2 of 97% (95% CI 96-98); low PA at 32% with I2 of 97% (95% CI 96-98). Secondly, the meta-analysis was conducted excluding studies with participant numbers N = <100. However, this did not significantly alter the results: EE at 34% with I2 of 90% (95% CI 85-94); DP at 24% with I2 of 98% (95% CI 97-98); low PA at 30% with I2 of 97% (95% CI 96-98). Heterogeneity of 75% - 100% is regarded as considerable (Higgins & Green, 2011). Due to the high variation in results, it may be misleading to rely on these pooled prevalence rates (Higgins & Green, 2011). However, this may be representative of the diversity of oncology care across different countries, cultures, and healthcare systems (see discussion). Significant variability existed for high prevalence rates of the emotional exhaustion (7.8%-100%), depersonalisation (1.8%-97.1%), and low personal accomplishment subscales (6.7%-100%).

If the definition of burnout as having high scores on either EE or DP is used, then across studies 36% (EE) of the oncology physicians were experiencing burnout. If the definition of burnout as indicated by high scores on EE or DP, or low PA is used, then across studies it increases slightly to 37% (low PA). Mean subscale scores and ranges for emotional exhaustion were 24.2 (15.6-44.9), for depersonalisation they were 8.3 (3.6-20.6), and for low personal accomplishment they were 34.6 (10.7-42). Again, there was significant variability in the range of means (see Table 3 for details).

Table 3. Mean MBI subscale scores and proportion of oncologists with low, medium, and high MBI subscale scores.

First Author	Year	EE mean (SD)	DP mean (SD)	low PA mean (SD)	EE % low	EE % med	EE % high	DP % low	DP % med	DP % high	Low PA % low	Low PA % med	Low PA % high
Alacacioglu	2009	-	-	-	-	-	7.8	-	-	15.6	-	-	100
Balbay	2011	15.57 (5.2)*	6.2 (3.45)*	18.72 (4)*	-	-	-	-	-	-	-	-	-
Banerjee	2017	25.3 (11.6)	10.2 (5.9)	34.8 (6.9)	-	-	44.7	-	-	50.4	-	-	34.5
Bar-Sela	2012	30.6*[a]	8.95*[a]	10.68*[a]	-	-	-	-	-	-	-	-	-
Blanchard	2010	-	-	-	-	-	23	-	-	35	-	-	-
Bragard	2010	19.5 (8.5)	6.5 (4.5)	39 (5.5)	-	-	-	-	-	-	-	-	-
Bragard	2012	25.9 (8.8)	-	-	18	34	48	-	-	-	-	-	-
Bressi	2008	-	-	-	35.6	32.2	32.2	44.6	25.6	29.8	12.4	25.6	62
Catt	2005	-	-	-	-	-	26∓	-	-	24∓	-	-	38∓
Cubero	2015	25.7[a]	12[a]	41	29.4[a]	21.6[a]	49[a]	5.9[a]	29.4[a]	64.7[a]	17.6[a]	25.5[a]	56.9[a]
Demirci	2010	25.35∓	6.18∓	36.95∓	-	-	-	-	-	-	-	-	-
Diggen	2014	17.74 (9.93)	3.62 (3.35)	37.17 (7.15)	-	-	19.5	-	-	1.8	-	-	16.8
Eelen	2014	-	-	-	-	-	38.9	-	-	27.6	-	-	6.7
Elit	2004	-	-	-	-	-	34	-	-	14.3	-	-	32.4
Glasberg	2007	23.5	11.6	39.6	42.2	18.6	39.2	1	43.1	55.9	14.7	28.4	56.9
Grunfeld	2000	-	-	-	-	-	53.3	-	-	22.1	-	-	48.4
Leung	2017	-	-	-	-	-	-	-	-	-	-	-	-
Liakopoulou	2008	22.9 (9.6)	5.6 (4.7)	37.2 (6.5)	-	-	-	-	-	-	-	-	-
Mampuya	2016	-	-	-	61	25	14	79	10	10	20	24	56
Probst	2012	22.9 (10.6)	7.1 (4.8)	37 (6.5)	-	-	-	-	-	-	-	-	-
Ramirez	1995	-	-	-	-	-	31.3∓	-	-	22.6∓	-	-	32.8∓
Ramey	2017	20.5	7.1	39.4	-	-	28.3	-	-	17.1	-	-	12.2
Roth	2011	-	-	-	-	28	28	-	15	7	-	32	16
Shanafelt	2014	22	5	42	40.1	21.6	38.3	52.3	22.8	24.9	63	23.8	13.2
Singh	2016	44.9 (7.1)∓	20.6 (5.6)∓	32.9(4.9)∓	-	-	100∓	-	-	97.1∓	-	-	34.3
Taylor	2005	-	-	-	-	-	44∓**	-	-	-	-	-	-
Travado	2005	20.21 (11.1)	5.89 (4.9)	37.84 (5.55)	49.6	24.8	25.6	56.1	21.4	22.3	40.4	38	21.4
Averages		**24.2**	**8.3**	**34.6**	-	-	**36.3**	-	-	**30.1**	-	-	**37.6**

* Prorated to equivalent full-scale score for comparison
** Second time point (2002) used in burnout calculation
[a] Intervention, first time point data used
∓ Oncology physician-specific data extracted by author
EE = Emotional Exhaustion MBI subscale, DP = Depersonalisation MBI subscale, low PA = Low Personal Accomplishment MBI subscale
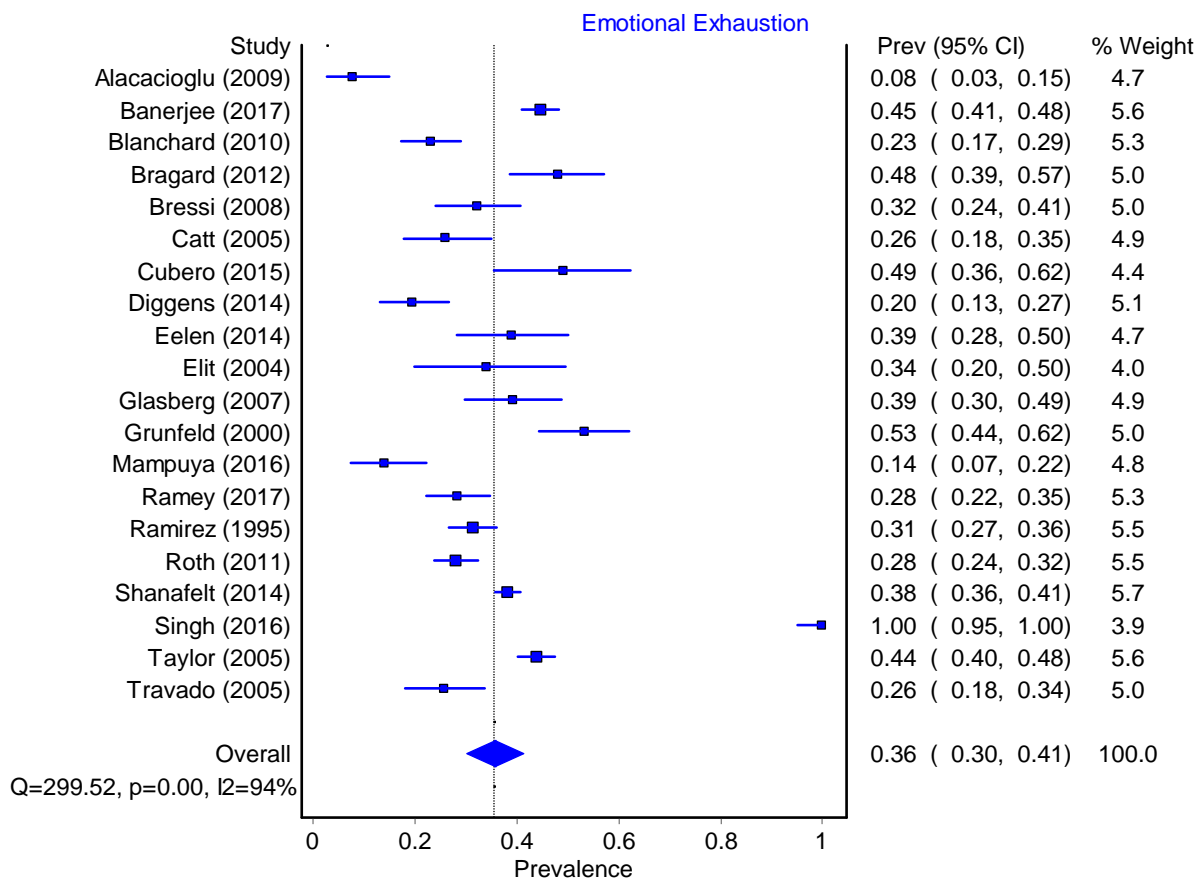
Figure 2. Prevalence, confidence intervals, and publication weights of high levels of emotional exhaustion.
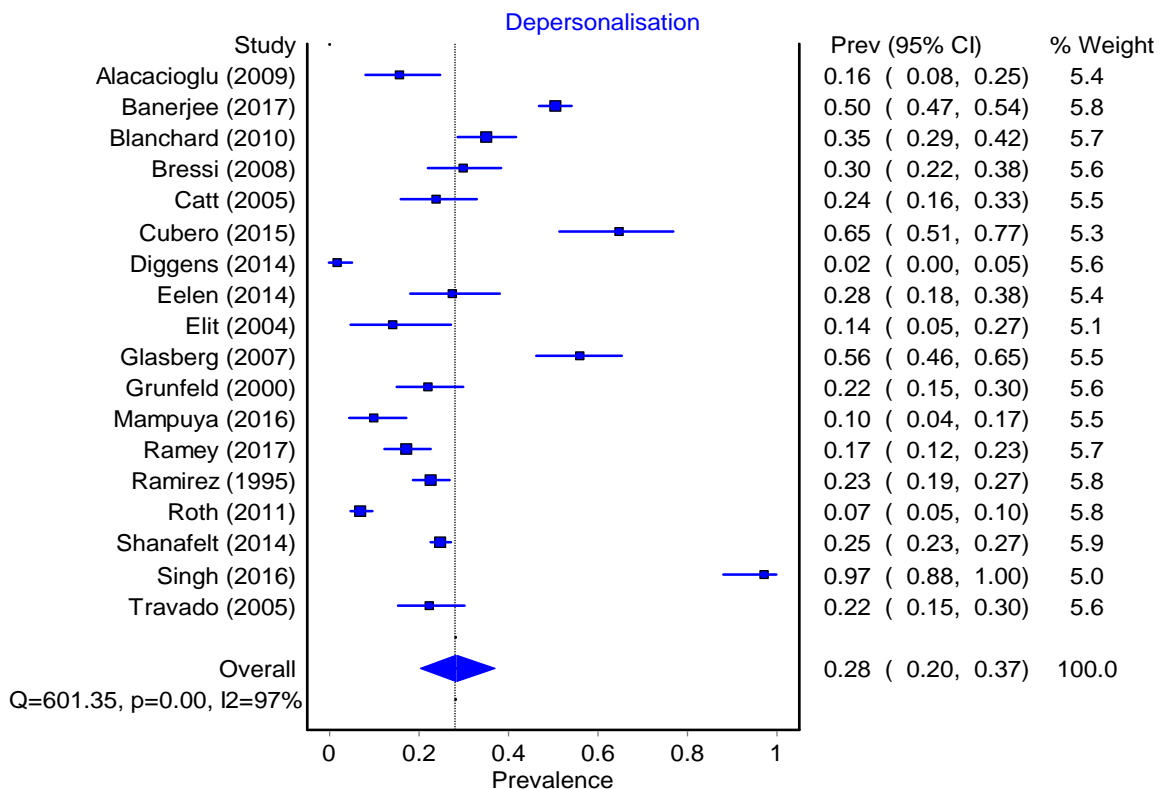
Figure 3. Prevalence, confidence intervals, and publication weights of high levels of depersonalisation.
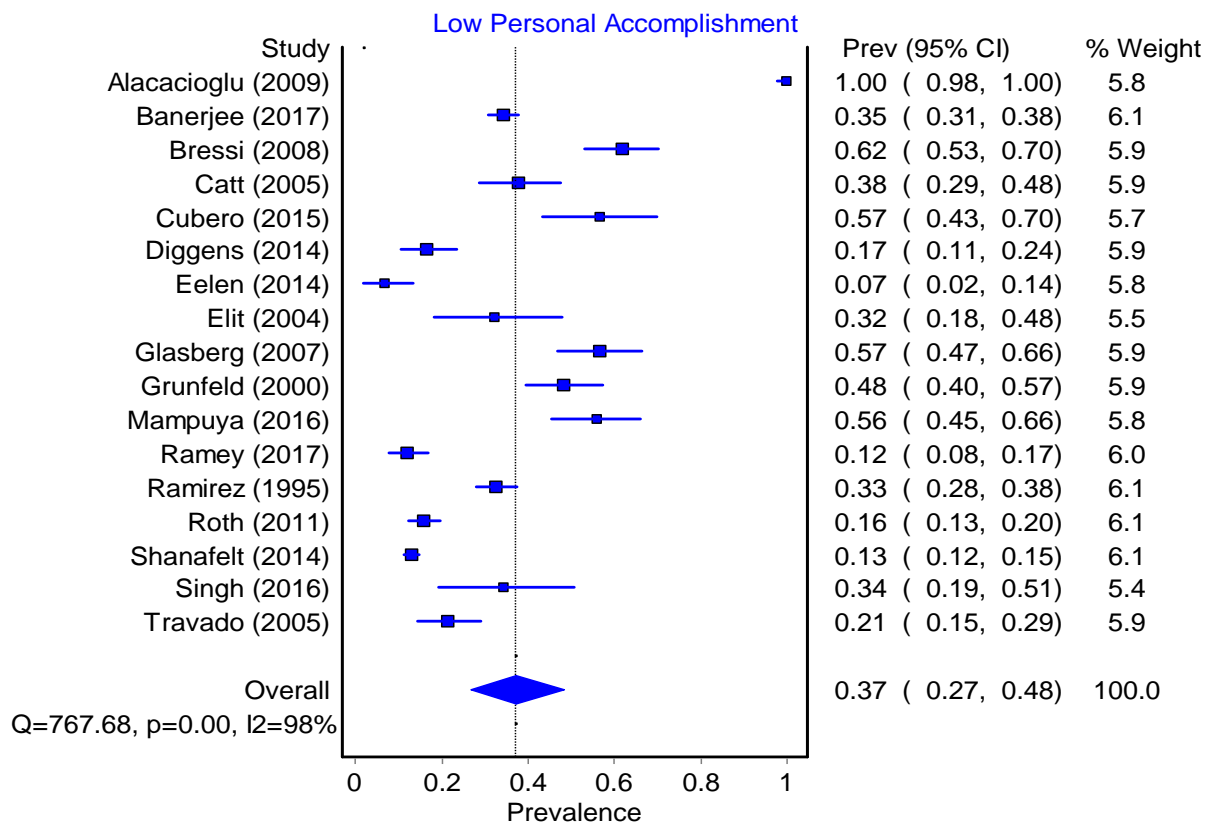
Figure 4. Prevalence, confidence intervals, and publication weights of low personal accomplishment.

Of the 27 studies reviewed, 20 provided additional participant data regarding factors found to be associated with higher levels of burnout. Those showing statistically significant associations with levels of burnout ($p \leq 0.05$) have been grouped into three areas for analysis: demographic differences, individual factors (psychological and personal life factors), and work factors (patient and working environment factors), see Table 4 for details.

Table 4. Statistically significant factors associated with burnout scores in oncology physicians.

First Author & No of Oncology Physicians	Individual Factors			Work Factors	
	Demographic Factors	Psychological Factors	Personal Life Factors	Patient Factors	Working Environment
Alacacioglu (2009) **N = 77**	**EE** • Age – older with lower EE (r=-0.418)* • Work exp – more with lower EE(r=-0.322)* • Single - higher in single physicians ($\overline{x}$ =18 [6.1])* **DP** • Age - older with lower DP (r=-0.377)* • Work exp - more with lower DP (r=-0.377)* • Single - higher in single physicians ($\overline{x}$ =6.5 [3.1])* **PA** • Age older with higher PA (r=0.406)* • Work exp – more with higher PA (r=0.324)* • Single - higher in single physicians ($\overline{x}$ =20.3 [3.6])*	-	-	-	-
Banerjee (2017) **N = 737**	**Overall Burnout Score** • Not living alone – with lower burnout (MVA β=-3.17 95% CI -5.92-0.42)**	-	-	-	**Overall Burnout Score** • No access to support services – with higher burnout (MVA β=3.32 95% CI -0.53-6.12)** • Poor work-life balance – with higher burnout (MVA β=9.70 95% CI 7.15-12.23)** • Poor vacation time –with higher burnout (MVA β=4.01 95% CI 1.49-6.64)*

Table 4. Statistically significant factors associated with burnout scores in oncology physicians.

| First Author & No of Oncology Physicians | Individual Factors | | | Work Factors | |
	Demographic Factors	Psychological Factors	Personal Life Factors	Patient Factors	Working Environment
	EE • Not living alone - with lower burnout EE (MVA β=-2.30 95% CI -4.50-0.11)**				**EE** • No access to support services – with higher burnout (MVA β=2.86 95% CI -1.01-4.71)* • Poor work-life balance – with higher burnout (MVA β=9.50 95% CI 7.80-11.20)* • Poor vacation time – with higher burnout (MVA β=3.40 95% CI 1.70-5.10)* **DP** • Poor work-life balance – with higher burnout (MVA β=2.55 95% CI 1.55-3.55)* **PA** • Poor work-life balance – with higher burnout (MVA β=2.62 95% CI 1.62-3.62)*
Blanchard (2010) N = 204	**EE** • Female - women higher EE than men (ULR β=3.8[1.4])*	**EE** • Psychosomatic disorders – more with high EE (ULR* & MLR β=0.6 [0.1]*) • Anxiolytic usage - more with high EE (ULR β=7.8[1.7]* & MLR β=2.9[1.3]*) **DP** • Psychosomatic disorders -	**EE** • Perception of poor physical condition – worse with high EE (ULR β=5.5[1])* **DP** • Perception of poor physical condition – worse with high EE (ULR β=3.8[0.9]*)	-	**EE** • Desire to quit - higher with high EE (ULR β=8.2[1.9])* • Desire to change speciality – higher with high EE (ULR β=9.3[2.2])*

Table 4. Statistically significant factors associated with burnout scores in oncology physicians.

First Author & No of Oncology Physicians	Individual Factors			Work Factors	
	Demographic Factors	Psychological Factors	Personal Life Factors	Patient Factors	Working Environment
		more with high EE (ULR β=0.3[0.07])* • Anxiolytic usage (ULR β=3.8[0.9]* & MLR β=2.1[0.9]**) • Existential questioning – more with high EE (ULR* & MLR β=0.26[0.1]**)			
Bragard (2010) N = 62	-	-	-	**EE** • Number of patients (r=-0.36)*	-
Bragard (2012) N = 113	-	**EE** • QWLSI goal - worse quality of work life score with higher EE (MRA β=0.206 t=2.254)** • QWLSI gap - worse quality of work life score with higher EE (MRA β=0.282 t=2.821)*	-	-	-
Cubero (2015) N = 54	-	-	**EE** • Family support – more with less EE ɪ** **DP** • Catholic religion – follower with higher DP ɪ* • Psychotherapy – therapy with less DP ɪ** **PA** • Higher income – higher with	-	**EE** • Excessive workload ɪ** **DP** • Excessive workload ɪ**

Table 4. Statistically significant factors associated with burnout scores in oncology physicians.

First Author & No of Oncology Physicians	Individual Factors			Work Factors	
	Demographic Factors	Psychological Factors	Personal Life Factors	Patient Factors	Working Environment
			higher PA MW**		
Diggens (2014) N = 110	-	-	-	-	**EE** • Job stress – more with higher EE (r=-0.482)* • Job satisfaction – less with higher EE (r=-0.299)* **DP** • Job stress – more with higher DP (r=-0.236)** • Job satisfaction – less with higher DP (r=-0.213)** **PA** • Job satisfaction – more with higher PA (r=0.399)*
Elit (2004) N = 39	**DP** • Age (?) **PA** • Few partners –with lower PA (?)	-	-	**DP** • Time direct patient care – more with higher DP (?) **PA** • Time direct patient care – more with lower PA (?) • High number of follow-ups – more with lower PA (?)	**EE** • Stress – more with higher EE (?) • Job satisfaction – less with higher EE (?) **DP** • Job satisfaction - less with higher DP (?) • Interest in leaving job – more with higher DP (?) • Interest in reducing hours - more with higher DP (?) • Planning to retire - more with higher DP (?) **PA** • Time doing admin – less with

Table 4. Statistically significant factors associated with burnout scores in oncology physicians.

First Author & No of Oncology Physicians	Individual Factors			Work Factors	
	Demographic Factors	Psychological Factors	Personal Life Factors	Patient Factors	Working Environment
					more PA (?) • Time in education or research - less with more PA (?) • Number of calls per month – less with more PA (?)
Glasberg (2007) N = 102	• Living with a companion – with lower burnout (MLR?**)	-	• Having a hobby and/or regular physical activity – with lower burnout (MLR?**)	-	• Insufficient holiday time – with higher burnout (MLR?**)
Grunfeld (2000) N = 121	-	-	-	-	**EE** • Increased odds of considering alternative work – with higher EE (OR 2.38, 95% CI 1.46-3.86)*
Leung (2017) N = 107	-	-	**EE** • Interpersonal demands – more with higher EE (?) **DP** • Interpersonal demands – more with higher DP (?) **PA** • Interpersonal demands – less with higher PA (?)	-	**EE** • Stress – more with higher EE (?) • Demands on time – more with higher EE (?) **PA** • Satisfaction with value/delivery of services – more with higher PA (?) • Stress - less with higher PA (?) • Delivery demands - less with higher PA (?)
Mampuya (2016) N = 87	-	**EE** • GHQ – higher scores with higher EE (β=0.16 [0.04] 95% CI 0.08-0.24)* **PA** • GHQ - lower scores with	-	**EE** • Number of patients – more with higher EE (β=0.35)*	-

Table 4. Statistically significant factors associated with burnout scores in oncology physicians.

First Author & No of Oncology Physicians	Individual Factors			Work Factors	
	Demographic Factors	Psychological Factors	Personal Life Factors	Patient Factors	Working Environment
		higher PA (β=-0.1 [0.03] 95% CI -0.18- -0.03)*			
Prost (2012) N = 87	-	-	-	-	**EE** • Job dissatisfaction - more with higher EE (r=0.292)* • Intention to leave - more with higher EE (r=-0.378)* • Leadership practices inventory - sub-scale enable others to act – less with higher EE (r=-0.282)** • Leadership practices inventory - sub-scale encourage the heart – less with higher EE (r=-0.266)** • Task load item role extension - more with lower EE (r=-0.224)**
Ramirez (1995) N = 393	**EE** • <55 years old – with lower EE (RR 2.19 95% CI 1.25-4.09)* **DP** • <55 years old – with lower EE (RR 3.80 95% CI 1.61-9.52)*	**EE** • GHQ – higher scores with higher EE (r=0.56)*	-	**EE** • Dealing with patient suffering - more with higher EE (RR 1.63 95% CI 1.24-2.17)* **DP** • Dealing with patient suffering - more with higher DP (RR 1.97 95% CI 1.38-2.85)* • Not dealing well with patients and relatives - more with higher DP	**EE** • Being overloaded impacting on home life – more with higher EE (RR 3.78 95% CI 2.56-5.61)* **DP** • Being overloaded impacting on home life - more with higher DP (RR 2.28 95% CI 1.54-3.52)* **PA** • Stress from treatment toxicity

Table 4. Statistically significant factors associated with burnout scores in oncology physicians.

First Author & No of Oncology Physicians	Individual Factors			Work Factors	
	Demographic Factors	Psychological Factors	Personal Life Factors	Patient Factors	Working Environment
				(RR 0.44 95% CI 0.27-0.71)* **PA** • Not dealing well with patients and relatives - less with higher PA (RR 0.41 95% CI 0.27-0.60)*	errors – less with higher PA (RR 1.52 95% CI 1.14-2.03)* • Professional status and esteem - more with higher PA (RR 0.65 95% CI 0.50-0.83)*
Ramey (2017) N = 205	-	• Being indecisive -with higher burnout (UVA OR 2.54 95% CI 1.36-4.77)**	-	-	• 60+ hours a week - with higher burnout (UVA OR 2.21 95% CI 1.18-4.12)** • Need to come in/more weekend work - with higher burnout (UVA OR 2.12 95% CI 1.07-4.40**) • Adequate work-life balance with lower burnout (UVA OR 0.22 95% CI 0.11-0.42** MVA OR 0.38 95% CI 0.17-0.85**) • Perception program is invested in resident education - with lower burnout (UVA OR 0.31 95% CI 0.16-0.59**) • Resident belief they would choose the same program again - with lower burnout (UVA OR 0.28 95% CI 0.15-0.52)** • Perception staff work well together - with lower burnout (UVA OR 0.31 95% CI 0.15-0.64)** • Adequate social worker support - with lower burnout (UVA OR 0.55 95% CI 0.30-

Table 4. Statistically significant factors associated with burnout scores in oncology physicians.

First Author & No of Oncology Physicians	Individual Factors			Work Factors	
	Demographic Factors	Psychological Factors	Personal Life Factors	Patient Factors	Working Environment
					0.99)**
Roth (2011) **N = 410**	• Female - women higher than men* • Work exp - more experience with lower burnout (MVA OR 0.388 95% CI 0.205-0.732)*	-	• Dissatisfied with life outside work - more with higher burnout (MVA OR 0.238 95% CI 0.143-0.396)*	-	• 80%+ time clinical care - more with higher burnout* • 12+ week managing ward floor - more with higher burnout* • No services for those affected by burnout –higher burnout (MVA OR 0.516 95% CI 0.303-0.878)** • Providing debriefs – with lower burnout (MVA OR 0.582 95% CI 0.336-1.005)**
Shanafelt (2014) **N = 1490**	• Age – young with higher burnout* • Female - women higher than men* • Single – with higher burnout** • Not having children – with higher burnout*	-	• More loan debt – with higher burnout*	• Number of patients – higher with higher burnout UVA * • Hours seeing patients – more with higher burnout UVA * • Devoting more time to patient care – more with higher burnout UVA *	• Hours worked - more with higher burnout UVA *
Travado (2005) **N = 121**	-	**EE** • PBS – higher scores with higher EE (r=0.26)* • EOC negative – more negative with higher EE (r=-0.21)** **DP**	-	-	-

Table 4. Statistically significant factors associated with burnout scores in oncology physicians.

First Author & No of Oncology Physicians	Demographic Factors	Individual Factors		Work Factors	
		Psychological Factors	Personal Life Factors	Patient Factors	Working Environment
		• PBS – higher scores with higher EE (r=-0.21)** • EOC positive – less positive with higher DP (r=0.34)* • EOC negative – more negative with higher DP (r=-0.25)* **PA** • SCSS – better communication scores with higher PA (r=0.37)* • EOC negative – less negative with more PA (r=0.28)* • EOC positive – more positive with higher PA (r=-0.28)*			

EE=Emotional Exhaustion, DP=Depersonalisation, PA=Personal Accomplishment, GHQ=General Health Questionnaire, QWLSI=Quality of Work Life Systemic Inventory, PBS=Physician Belief Scale, EOC=Expected Outcome of Communication, SCSS= The Self-Confidence in Communication Skills, [ ]=SD, ULP=Univariate Linear Regression, MLR=Multivariate Linear Regression, MRA=Multiple Regression Analysis, MW=Mann-Whitney, r=Pearson's r Correlation, ?= statistical information absent from paper, OR=Odds Ratio, UVA=Univariate Analysis, MVA=Multivariate Analysis, x̄=mean, β=Standardized Regression Coefficients, RR=Relative Risk,*=Significant at the p<0.01 level,**=Significant at the p<0.05 level, ⱦ=Independent samples t-test

Demographics

Only two studies provided paediatric oncologist data. Therefore there should be caution in generalising the findings to this subgroup of professionals. As there was variability in the quality of statistical information provided by the 27 studies, critical analysis is warranted. Fourteen of the studies did not present physician-specific demographic data for relationships between burnout and gender. This was due to either no statistical data regarding relationships being presented or where physician data was grouped with other professions collectively, e.g., a whole oncology team, rendering obtaining physician data impossible. Of the remaining 13, three found women to be more likely to experience burnout (Blanchard et al., 2010b; Roth et al., 2011; Shanafelt, Raymond, et al., 2014). However, ten of the studies found no significant differences between men and women. Given these contradictory results, it is difficult to reach a definite conclusion on gender differences.

Four of the studies (Alacacioglu et al., 2009; Banerjee et al., 2017; Elit et al., 2004; Glasberg et al., 2007) stated they found being single, living alone, or having fewer partners to be associated with higher levels of burnout. However, no statistical information is provided by Elit and colleagues (2004) for their notion that having fewer partners correlated with low PA. Glasberg and colleagues (2007) state that they conducted multivariate logistic regression analysis and found having a companion to be associated with lower rates of burnout, but do not provide results of the statistical test other than statistical significance information (p=0.017). As such, these two study's findings should be viewed with caution. Alacacioglu and colleagues (2009) received a quality tool rating of five. This was due to a lack of clarity regarding how the participants were sampled, the study's small sample size being sourced from a single oncology clinic in Turkey, and unclear guidance as to what steps, if any, the authors took to manage this appropriately. Therefore, it is difficult to view these findings with confidence. While there is concern regarding the reliability of the findings in Alacacioglu et al., (2009), Elit et al., (2004), and Glasberg et al., (2007), the study from Banerjee and colleagues (2017) used a large sample of participants and was conducted across multiple European countries. This increases confidence in concluding that being in a relationship with a significant other may help to protect individuals from burnout. See Tables 3 and 4 for details.

Three of the studies reviewed (Alacacioglu et al., 2009; Ramirez et al., 1995; Shanafelt et al., 2014) found younger physicians disclosed higher rates of burnout. One study (Elit et al., 2004) stated that their findings suggesting that DP subscale scores increased with age was statistically significant, however as above, the authors have not provided statistical information regarding this finding, and as such, their conclusion should be interpreted with

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caution. While Alacacioglu and colleague's (2009) study is limited to a single, small population size, Ramirez et al., (1995), and Shanafelt, (2014) used larger sample sizes of 393 and 1490 respectively. Confidence in Ramirez and colleague's (1995) age association finding are enhanced by their logistic regression analysis. While this study is over 20 years old, these findings remain consistent with more recent studies. Though limited to the US, Shanafelt et al., (2014) were able to collect a large sample of participants, the largest of the 27 studies reviewed. They also utilised multivariate logistic regression to produce their age findings. Overall, there is reasonable evidence to suggest that younger physicians disclose higher levels of burnout, see Table 4.

Individual Factors - Psychological and Personal Life Factors

Blanchard and colleagues (2010) found that higher burnout scores on the subscales of emotional exhaustion and depersonalisation were associated with an increase in psychosomatic disorders and anxiolytic usage. While the findings of the study are limited in their generalisability due to only being conducted in France and only applicable to oncologist residents, all oncology residents in the nation were invited to participate, with a response rate of 60%. Two of the studies (Mampuya et al., 2017; Ramirez et al., 1995) found higher burnout scores to be associated with higher General Health Questionnaire (GHQ) scores. Respectively, these two studies were conducted in Japan and the UK, which suggests a degree of generalisability to the broader oncology physician population (see Table 4). The other three studies (Blanchard et al., 2010a; Mampuya et al., 2017; Ramirez et al., 1995) were rated as high quality on the JBI Systematic Reviews: Checklist for Prevalence Studies (Munn, Moola, Lisy, Riitano, & Tufanaru, 2015) quality tool (see Table 1). Therefore, there is reasonable evidence to suggest higher levels of burnout are associated with reduced psychological well-being. However, the direction of the association is unclear.

Higher levels of burnout were also associated with worse physical health and tiredness in two of the studies (Blanchard et al., 2010b; Glasberg et al., 2007). Leung & Rioseco, (2017) found burnout was associated with interpersonal demands, and Roth and colleagues (2011) found burnout was associated with dissatisfaction with life outside of work. As stated above, the methodological rigour of Glasberg and colleagues (2007) prompts caution in interpreting their findings. However, the remaining studies provide confidence in concluding that burned out oncology physicians also report experiencing difficulties outside of the workplace.

The majority of data presented by the studies looking at factors associated with burnout were those concerning workplace factors. Four of the studies (Bragard et al., 2010; Elit et al., 2004; Ramirez et al., 1995; Shanafelt, Raymond, et al., 2014) found that high patient caseload, patient death, direct patient care time, number of follow-ups, or dealing with patient suffering, to all be associated with higher levels of burnout. All three of these studies were rated as high quality on the quality tool, however as stated above, Elit and colleagues (2004) findings must be viewed with caution due to lack of statistical information. Three studies (Blanchard et al., 2010b; Elit et al., 2004; Probst et al., 2012a) found burnout was associated with a desire to quit, change speciality, reduce hours, or retire early. The high quality tool rating and response rate of Blanchard et al., (2010a) (60%) gives confidence in their findings. However, the moderate quality rating of Probst et al. (2012b) and lack of statistical information from Elit et al., (2004) suggests further replication of the findings are needed to assist generalisability. Seven of the studies (Banerjee et al., 2017; Cubero et al., 2016; Leung & Rioseco, 2017; Ramey et al., 2017; Roth et al., 2011; Shanafelt, Raymond, Kosty, et al., 2014; Singh et al., 2016) found hours worked/excessive workload, delivery demands, a lack of free time, amount of clinical time, or inadequate work-life balance were associated with higher levels of burnout. These seven studies have quality ratings ranging from moderate to high (four as high), four had large sample sizes of N = >400, and data covers, North and South America, Europe, and Australasia, which gives confidence in the generalisability of the findings. Three studies (Diggens & Chesson, 2014; Elit et al., 2004; Leung & Rioseco, 2017) found job stress also to be associated with increased scores of burnout. However, it is important not to assume the direction of the association. Furthermore, Diggens & Chesson (2014) received a quality tool rating of five. Similarly to Alacacioglu et al., (2009), this was due to the quality of participant sampling, and the study's small sample size, but also concerns regarding coverage bias of the subgroups of the population, therefore, the findings should be viewed with caution. Finally, three studies (Diggens & Chesson, 2014; Elit et al., 2004; Probst et al., 2012a) found oncologists being dissatisfied with their job was associated with higher levels of burnout. However all studies had modest sample sizes, and Elit et al. (2004) lacks statistical information. As such, the findings should be viewed with caution. Further research is needed to support the accuracy of these findings.

Discussion

Collectively, the findings of the studies were in line with previous studies of healthcare professionals who have been found to experience significant levels of burnout (Hall et al., 2016), e.g. emergency nurses (Adriaenssens, De Gucht, & Maes, 2015; Khamisa, Peltzer, & Oldenburg, 2013) and physicians in a variety of specialities (Shanafelt et al., 2015). The levels of burnout are also congruent with research examining general oncology staff and those working in palliative care (Martins Pereira et al., 2011; Trufelli et al., 2008). The pooled meta-analysis prevalence rates of burnout in the EE subscale found in this review (36%) are slighter higher than Medisauskaite & Kamau's (2017) systematic review and meta-analysis findings (32%). To that end, it is essential to discuss the findings in more detail.

Variation of Burnout Rates Between Studies

Across studies, there was considerable variation in the burnout scores of the three subscales (EE, DP, low PA). There are a number of factors which may contribute to these findings. The studies came from a variety of different countries, each with their own individual culture and healthcare system, which themselves have different styles of training and wage/compensation (Gómez-Urquiza et al., 2016).

The MBI itself has been translated into more than 30 different languages (Maslach et al., 2017). However, "No study has systematically examined how researchers address cross-cultural adaptation of burnout" (Squires et al., 2014, p1.). Furthermore, the language used in the MBI has been found to moderate the associations between burnout and its risk factors. A meta-analysis of 81 studies examining moderating variables of burnout in nurses found effect sizes were clustered differently (Vargas, Cañadas, Aguayo, Fernández, & de la Fuente, 2014). Squires and colleagues (2014) note that there is a problem in the validity of MBI translations due to cultural understandings of burnout both conceptually and linguistically. This was highlighted by cross-cultural instrument analysis findings that seven of the 22 question items on the MBI received a low kappa score (Squires et al., 2014). The researchers reviewed 30 studies where the MBI was used to measure burnout, covering 26 countries and 20 different languages. They found efforts to translate the MBI were inconsistent, for example, Bressi et al., (2008) states "use of Italian version" of the MBI (Squires et al., 2014. p62), without an explanation of the origin of this form of the measure. Similarly, Ndetei et al., (2008) use the MBI with Swahili speaking population but again fails to mention if or how the measure was

translated. Squires and colleagues (2014) also found that there was a lack of information in the studies regarding how different cultures understood the concept of burnout. The burnout rates presented in this review show considerable heterogeneity. While not exhaustive, the factors above demonstrate possible sources of the disparity between the studies.

Healthcare Systems, Excess Workload and Poor Work-Life Balance

This review has highlighted that oncology physicians appear to be experiencing significant levels of burnout. The statistical methods employed by the studies reviewed (mainly correlation) mean that causation cannot be assumed, however, the studies suggest possible associations between burnout and physician well-being across a number of areas. Excessive workload or poor work-life balance (including adverse impact on home life), high numbers of patients, large amounts of time conducting direct patient care, and a high number of follow-ups were all suggested to be associated with higher levels of burnout.

Psychological Well-Being and Job Dissatisfaction

In this review, dealing with patient suffering, psychosomatic disorders, anxiolytic usage, and higher GHQ scores were all found to correlate with higher levels of burnout. This suggests that there is a link between burnout and psychological well-being in oncologists. This review also highlighted that oncologists appear to be dissatisfied with their job or the value/delivery of services and that this too is associated with higher levels of burnout. Furthermore, burnout was associated with a desire to quit, change speciality, reduce hours, or retire early. While the direction of the association is unclear, the psychological well-being of oncology physicians appears to be linked to burnout, which in turn may lead to physicians leaving the profession prematurely. Collectively, this poses a significant risk to the future of oncology care.

Oncology Burnout Rates Compared to Other Physician Specialities

Given the level of exposure to suffering and death within oncology, it has been hypothesised that oncologists are at greater risk for burnout than their colleagues in other specialities (Shanafelt & Dyrbye, 2012). However a recent national survey of all physician specialties in the US found EE, DP, and low PA rates were 47%, 35%, and 16% respectively, with 54% of physicians experiencing high rates in at least one of the three MBI subscales (Shanafelt et al.,

2015). Additionally, an extensive study spanning family physicians across 12 European countries found EE, DP, and low PA rates of 43%, 35%, and 32% respectively (Soler et al., 2008). The studies in this review appear to suggest that oncology physicians have lower rates of EE and DP, but increased low PA. Evidence suggests that EE and DP are the core components of burnout (Schaufeli et al., 2001; Taris et al., 2005). This, therefore, suggests that while oncology physicians experience significant levels of burnout, the levels are not as high as some physicians working in other specialities. This raises important questions about what factors oncologist experience that prevent the levels of burnout experienced by their colleagues in other specialities. At present, there is a lack of research regarding factors which may be protective against burnout for oncologists. However, resilience and mindfulness have been found to be significant predictors of lower levels of burnout and secondary traumatic stress in human service professionals (Harker, Pidgeon, Klaassen, & King, 2016). Oncology physicians may self-select to work in oncology due to protective qualities they possess. By its nature, oncology work involves exposure to prolonged patient suffering and therefore requires significant resilience. An innate high level of resilience may enable oncology physicians to endure these demands and therefore pursue a career in this area. Research on personality traits such as empathy have been shown to associated with medical students choosing people-oriented specialties rather than specialties which are e.g. procedure or technology-oriented (Hojat et al., 2005) Furthermore, there is evidence that those working in oncology experience key rewards in the form of relationships with patients and families, observing successful treatment, and developing expert skills in an intellectually demanding speciality (Mukherjee, Beresford, & Tennant, 2014). These may serve as a restorative experiences, which act as a protective buffer against burnout.

Implications of Review

Oncologists experience a significant degree of burnout. Burnout can result in medical errors, which put patient safety at risk, and costs healthcare institutions such as the NHS billions of pounds in extra care provision and litigation pay-outs (Department of Health, 2000; Hall et al., 2016). Burnt-out oncologists appear to be more likely to leave the profession prematurely. Given the predicted future increases in oncology service demand (Erikson, Salsberg, Forte, Bruinooge, & Goldstein, 2007), it is essential that this workforce be well maintained. Reducing burnout may help facilitate this.

Future research should aim to assess factors behind oncologists experiencing lower burnout than some of their colleagues in other specialities. This could assist in understanding preventative or protective factors. For example, those who pursue a career in oncology may inherently possess greater resilience, or the rewards of the profession may sufficiently

outweigh the negative aspects. Further to this, research should assess effective interventions to reduce burnout. Indeed, while prevalence rates of burnout in oncology has been well researched, few studies have focused on the effectiveness of interventions to reduce burnout. Furthermore, the dearth of studies regarding paediatric oncologist burnout suggests more research is also needed in this area.

This review has also highlighted inconsistencies in MBI burnout measurement. There were differences in how the authors of the studies categorised and recorded their burnout data. This makes the like-for-like comparison between studies a challenge. There is a need for greater consistency of reported burnout data.

Conclusion

There is evidence that burnout affects a significant number of oncology professionals across different workplaces and countries. Burnout appears to be associated with workplace demands and poor well-being. Furthermore, burnout seems to have negative implications regarding staff retention. This has concerning implications for oncology physicians, healthcare service finances, and patient safety. A consensus regarding burnout scoring seems pertinent to inform consistency of measurement in further studies. Improved reporting of statistics would also be of value, as would research into paediatric oncology. In addition, further insight into individual factors, and factors associated with lower burnout would facilitate health organisations taking steps to improve work-related well-being. There is also a need for research into effective interventions to combat burnout.

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Systemic Literature Review Study Quality Appraisal Tool

THE JOANNA BRIGGS INSTITUTE

JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data

Reviewer_____Date_____.

Author _____Year_____Record Number_____.

	Yes	No	Unclear	Not applicable
1. Was the sample frame appropriate to address the target population?	☐	☐	☐	☐
2. Were study participants sampled in an appropriate way?	☐	☐	☐	☐
3. Was the sample size adequate?	☐	☐	☐	☐
4. Were the study subjects and the setting described in detail?	☐	☐	☐	☐
5. Was the data analysis conducted with sufficient coverage of the identified sample?	☐	☐	☐	☐
6. Were valid methods used for the identification of the condition?	☐	☐	☐	☐
7. Was the condition measured in a standard, reliable way for all participants?	☐	☐	☐	☐
8. Was there appropriate statistical analysis?	☐	☐	☐	☐
9. Was the response rate adequate, and if not, was the low response rate managed appropriately?	☐	☐	☐	☐

Overall appraisal: Include ☐   Exclude ☐   Seek further info ☐

Comments (Including reason for exclusion)

_____

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JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data

How to cite: Munn Z, Moola S, Lisy K, Riitano D, Tufanaru C. Methodological guidance for systematic reviews of observational epidemiological studies reporting prevalence and incidence data. Int J Evid Based Healthc. 2015;13(3):147–153.

Answers: Yes, No, Unclear or Not/Applicable

1. **Was the sample frame appropriate to address the target population?**

   This question relies upon knowledge of the broader characteristics of the population of interest and the geographical area. If the study is of women with breast cancer, knowledge of at least the characteristics, demographics and medical history is needed. The term "target population" should not be taken to infer every individual from everywhere or with similar disease or exposure characteristics. Instead, give consideration to specific population characteristics in the study, including age range, gender, morbidities, medications, and other potentially influential factors. For example, a sample frame may not be appropriate to address the target population if a certain group has been used (such as those working for one organisation, or one profession) and the results then inferred to the target population (i.e. working adults). A sample frame may be appropriate when it includes almost all the members of the target population (i.e. a census, or a complete list of participants or complete registry data).

2. **Were study participants recruited in an appropriate way?**

   Studies may report random sampling from a population, and the methods section should report how sampling was performed. Random probabilistic sampling from a defined subset of the population (sample frame) should be employed in most cases, however, random probabilistic sampling is not needed when everyone in the sampling frame will be included/ analysed. For example, reporting on all the data from a good census is appropriate as a good census will identify everybody. When using cluster sampling, such as a random sample of villages within a region, the methods need to be clearly stated as the precision of the final prevalence estimate incorporates the clustering effect. Convenience samples, such as a street survey or interviewing lots of people at a public gatherings are not considered to provide a representative sample of the base population.

3. Was the sample size adequate?

The larger the sample, the narrower will be the confidence interval around the prevalence estimate, making the results more precise. An adequate sample size is important to ensure good precision of the final estimate. Ideally we are looking for evidence that the authors conducted a sample size calculation to determine an adequate sample size. This will estimate how many subjects are needed to produce a reliable estimate of the measure(s) of interest. For conditions with a low prevalence, a larger sample size is needed. Also consider sample sizes for subgroup (or characteristics) analyses, and whether these are appropriate. Sometimes, the study will be large enough (as in large national surveys) whereby a sample size calculation is not required. In these cases, sample size can be considered adequate.

When there is no sample size calculation and it is not a large national survey, the reviewers may consider conducting their own sample size analysis using the following formula: (Naing et al. 2006, Daniel 1999)

n= Z2P(1-P)

d2

Where:

n= sample size

Z = Z statistic for a level of confidence

P = Expected prevalence or proportion (in proportion of one; if 20%, P = 0.2)

d = precision (in proportion of one; if 5%, d=0.05)

Ref:

Naing L, Winn T, Rusli BN. Practical issues in calculating the sample size for prevalence studies Archives of Orofacial Sciences. 2006;1:9-14.

Daniel WW. Biostatistics: A Foundation for Analysis in the Health Sciences.

Edition. 7th ed. New York: John Wiley & Sons. 1999.

4. **Were the study subjects and setting described in detail?**

Certain diseases or conditions vary in prevalence across different geographic regions and populations (e.g. Women vs. Men, sociodemographic variables between countries). The study sample should be described in sufficient detail so that other researchers can determine if it is comparable to the population of interest to them.

5. **Was data analysis conducted with sufficient coverage of the identified sample?**

Coverage bias can occur when not all subgroups of the identified sample respond at the same rate. For instance, you may have a very high response rate overall for your study, but the response rate for a certain subgroup (i.e. older adults) may be quite low.

6. **Were valid methods used for the identification of the condition?**

Here we are looking for measurement or classification bias. Many health problems are not easily diagnosed or defined and some measures may not be capable of including or excluding appropriate levels or stages of the health problem. If the outcomes were assessed based on existing definitions or diagnostic criteria, then the answer to this question is likely to be yes. If the outcomes were assessed using observer reported, or self-reported scales, the risk of over- or under-reporting is increased, and objectivity is compromised. Importantly, determine if the measurement tools used were validated instruments as this has a significant impact on outcome assessment validity.

7. **Was the condition measured in a standard, reliable way for all participants?**

Considerable judgment is required to determine the presence of some health outcomes. Having established the validity of the outcome measurement instrument (see item 6 of this scale), it is important to establish how the measurement was conducted. Were those involved in collecting data trained or educated in the use of the instrument/s? If there was more than one data collector, were they similar in terms of level of education, clinical or research experience, or level of responsibility in the piece of research being appraised? When there was more than one observer or collector, was there comparison of results from across the observers? Was the condition measured in the same way for all participants?

8. **Was there appropriate statistical analysis?**

Importantly, the numerator and denominator should be clearly reported, and percentages should be given with confidence intervals. The methods section should be detailed enough for reviewers to identify the analytical technique used and how specific variables were measured. Additionally, it is also important to assess the appropriateness of the analytical strategy in terms of the assumptions associated with the approach as differing methods of analysis are based on differing assumptions about the data and how it will respond.

9. **Was the response rate adequate, and if not, was the low response rate managed appropriately?**

A large number of dropouts, refusals or "not founds" amongst selected subjects may diminish a study's validity, as can a low response rates for survey studies. The authors should clearly discuss the response rate and any reasons for non-response and compare persons in the study to those not in the study, particularly with regards to their socio-demographic characteristics. If reasons for non-response appear to be unrelated to the outcome measured and the characteristics of non-responders are comparable to those who do respond in the study (addressed in question 5, coverage bias), the researchers may be able to justify a more modest response rate.

Burnout in Paediatric Oncology Staff and the Relationship with Traumatic Stress, Psychological Flexibility, and Coping Strategies

Paper 2 Abstract

Introduction

Burnout has become recognised as a significant problem of modern day working (Maslach, Schaufeli, & Leiter, 2001). Maslach and colleagues (1981) characterise burnout by three key dimensions: emotional exhaustion; depersonalisation; and low personal accomplishment. While many aspects of caring for patients with cancer can be rewarding (Shanafelt & Dyrbye, 2012), paediatric oncology care professionals experience patients going through considerable suffering and often death and therefore may be particularly at risk of burnout.

Methods

Seventy-seven nurses, healthcare assistants, doctors, and consultants working in paediatric oncology teams in hospitals across England and Wales, and members of national paediatric oncology professional groups completed an online questionnaire. The proportion of staff experiencing burnout was measured using the aMBI (Maslach & Jackson, 1981; McManus, Winder, & Gordon, 2002). Post-traumatic stress symptoms were measured using the Trauma Screening Questionnaire (TSQ; Brewin et al., 2002). The Acceptance and Commitment Therapy (ACT) constructs of psychological flexibility and experiential avoidance were measured using the Comprehensive Assessment of Acceptance and Commitment Therapy processes (CompACT; Francis, Dawson, & Golijani-Moghaddam, 2016) and the Acceptance and Action Questionnaire–II (AAQ-II; Bond et al., 2011). Personal and organisational coping styles were assessed using the Brief COPE questionnaire (Carver, 1997) and a measure adapted from Colville and colleagues (2015). It was hypothesised that psychological flexibility and experiential avoidance may be associated with levels of burnout and that this may help in understanding the strategies implemented by paediatric oncology staff.

Results

The number of participants experiencing burnout was high. Maslach Burnout Inventory scores showed 51.9% of staff had high levels of emotional exhaustion, 11.7% had high levels of depersonalisation, and 15.6% showed a low sense of personal accomplishment. Furthermore, 13% showed significant levels of post-traumatic stress symptoms. Statistical analysis demonstrated that higher levels of burnout and post-traumatic stress symptoms correlated with staff that showed less psychological flexibility, those that used more experientially avoidant ways of coping, and those that used less organisational support strategies.

Conclusion

The findings suggest that there is significant level of burnout amongst paediatric oncology staff. Interventions which increase psychological flexibility could prove to be an effective intervention to reduce burnout and risk of post-traumatic stress in paediatric oncology staff.

Introduction

Burnout and Oncology

The 1970s saw the rise of a phenomenon described as burnout, now considered a growing problem of modern day working (Maslach, Schaufeli, Wilmar & Leiter, 2001). Initially conceptualised to describe the experience of those in the helping or healthcare professions, burnout is defined as an understandable psychological response to stressors in the workplace (Maslach, 1976). Maslach and colleagues (Maslach et al., 1986, 2017) developed the Maslach Burnout Inventory (MBI) measure and characterise burnout by three key dimensions: emotional exhaustion; depersonalisation; and low personal accomplishment. Systematic reviews have shown healthcare staff are particularly vulnerable to burnout (Hall et al., 2016). An average of 26% of emergency nurses (Adriaenssens et al., 2015), up to 50% of critical care professionals (Peckham, 2015), and up to 70% of intensive care unit professionals (van Mol, Kompanje, Benoit, Bakker, & Nijkamp, 2015) have been shown to experience burnout.

Although not as high as some medical specialities (Shanafelt et al., 2015) research has shown significant levels of burnout in oncology staff (Catt et al., 2005; Sherman, Edwards, Simonton, & Mehta, 2006). These professionals work with patients experiencing chronic and often critical ill health, over long durations, and with the relationship frequently culminating in the death of the patient. Dealing with patient suffering appears to be associated with higher levels of burnout in oncology physicians (Ramirez et al., 1995). A literature review of oncology professionals found that 10-33% of staff experienced high levels of emotional exhaustion (EE), 10-23% experienced high levels of depersonalisation (DP), and 20-33% experienced low levels of personal accomplishment (low PA) (Sherman et al., 2006). A more recent systematic review by Trufelli and colleagues (2008) found 36% of oncology staff experienced high rates of EE, 34% experienced high rates of DP, and 25% experienced low PA.

While burnout in adult oncology professionals has received extensive attention, it is surprising that only a small number of studies on paediatric oncology staff have been conducted (Mukherjee, Beresford, Glaser, & Sloper, 2009). A study in Greece (Liakopoulou et al., 2008) found the 41% of paediatric oncology staff were burnt-out. More widely, a multinational study (Roth et al., 2011), found paediatric oncology physician burnout prevalence of 28%. It is argued that staff working in paediatric oncology experience a number of demands which are specific to the speciality and negatively impact psychological well-being (Mukherjee, Beresford, & Tennant, 2014; Mukherjee, Beresford, Glaser, & Sloper, 2009). For example, the premature death of children, and providing support and managing the distress

of parents and families (Mukherjee et al., 2009). Indeed, Papadatou (1997) has highlighted how staff can experience a patient death as a three-fold failure: failure to save the child, failure as an adult protector, and failing the child's parents.

In addition to the emotional impact for staff, burnout also has implications for patient care; poor staff wellbeing and burnout have been found to be significantly associated with reduced patient safety (de Oliveira Jr et al., 2013; Hall et al., 2016). Burnt-out doctors make a larger number of clinical errors and have a reduced sense of empathy (West et al., 2006; Wilkinson, Whittington, Perry, & Eames, 2017). Also, burnout has significant implications for health services. In the UK, healthcare has the highest level of absenteeism of all sectors (Walker & Bamford, 2011), which is estimated to cost the taxpayer £2.4bn a year (Department of Health, 2015). Burnout is a significant predictor of time off work due to ill health (Anagnostopoulos & Niakas, 2010). Collectively, existing research indicates that reducing burnout in the NHS might have significant benefits for patients, staff (Hall et al., 2016), and service finances (Boorman, 2009).

Post-Traumatic Stress

Although less researched than burnout, post-traumatic stress disorder (PTSD) is also a risk for healthcare staff. The symptoms of PTSD include high states of arousal, flashbacks, nightmares, and disturbing thoughts or feelings related to a traumatic event. Symptoms of PTSD have been found in 14% of general nurses and 22% - 29% of intensive care nurses (Mealer, Burnham, Goode, Rothbaum, & Moss, 2009; Mealer, Shelton, Berg, Rothbaum, & Moss, 2007). The author is unaware of any research explicitly exploring the prevalence of PTSD in oncology staff. However, a small study covering multiple professionals based in one hospital (Quinal, Harford, & Rutledge, 2009) found 16% of oncology nurses met the criteria for PTSD through secondary traumatic stress (STS). Similarly, another multi-professional single hospital study (Czaja, Moss, & Mealer, 2012) found that 18% of paediatric oncology nurses experienced PTSD and 16% experienced both PTSD and burnout.

Personal Coping and Psychological Flexibility

Historically, research on burnout and PTSD amongst healthcare staff has focused more on prevalence studies, with a limited investigation of resilience and coping factors that might play a protective role. This might be significant as there is some evidence that intuitive ideas around coping may not be effective. For example, Colville et al., (2015) found that strategies

that healthcare staff reported finding most helpful for coping with work stress did not correspond with better outcomes.

In the broader occupational stress literature, psychological flexibility has drawn significant attention from researchers as a critical underlying factor related to coping. Psychological flexibility is a key concept of Acceptance and Commitment Therapy (ACT). The term refers to the '...ability to fully contact the present moment and the thoughts and feelings it contains, without needless defence of avoidance, and, depending upon what the situation affords, persisting in or changing behaviour in pursuit of goals and values' (Hayes, Luoma, Bond, Masuda, & Lillis, 2006 *in* Bond, Flaxman, van Veldhoven, & Biron, 2010 p. 297). The key aspect of psychological flexibility therefore is maintaining full awareness of the present moment. This entails being mindful of your own thoughts, emotions, and physical senses, in addition to what is currently occurring around you. Importantly, psychological flexibility describes being able to take actions guided by your own individual values. A recent study (Duarte & Pinto-Gouveia, 2017) showed that psychologically flexible oncology nurses had lower rates of burnout. Studies have also demonstrated that individuals taught to engage in psychological flexibility are better able to cope with stressful situations at work and show improved mental health (Bond & Bunce, 2000).

A coping style considered less psychologically flexible is 'experiential avoidance,' the process whereby an individual actively attempts to evade situations/experiences due to the unpleasant thoughts, emotions and physical symptoms that are evoked in that person (Iglesias, de Bengoa Vallejo, & Fuentes, 2010). Individuals engaging in experiential avoidance as a coping strategy have been found to experience higher levels of stress, lower quality of life (Gold & Wegner, 1995), increased depression (Costa & Pinto-Gouveia, 2011), higher anxiety (Fledderus, Bohlmeijer, & Pieterse, 2010), poorer psychological well-being (Fledderus et al., 2010), and higher rates of PTSD (Kashdan, Morina, & Priebe, 2009). Iglesias et al. (2010) found that levels of experiential avoidance amongst critical care nurses significantly correlated with burnout scores.

Organisational Factors

In addition to individual resiliency factors, the organisational context is significant in influencing the well-being of healthcare staff (Boorman, 2009). Organisational factors such as effective staff support and engagement are vital for fostering healthy staff well-being (Department of Health, 2012). Supporting staff is crucial, not only on ethical grounds relating to the implications for patients and staff, but there is also a legal obligation for employers to look after their employees (ACAS, 2012).

Staff support varies across hospital trusts and health boards, but can include: reflective practice; supervision sessions; debriefs; staff training; clinical psychologists embedded within the medical team; employee well-being services; and confidential reflective multidisciplinary meetings. Some aspects of staff support in the UK have been evaluated, e.g., Schwartz Rounds® (Goodrich, 2011), but there is limited comparative evaluation of staff support provision (Henderson, Harvey, Øverland, Mykletun, & Hotopf, 2011; Joyce et al., 2016). Currently, NHS guidance mainly promotes examples of 'best practice' as opposed to evidence-based practice (NHS England, 2017). However, there are moves to improve this (NHS England, 2017). Furthermore, there appears to be an absence of studies considering the interaction between personal coping styles and propensity to engage with or benefit from organisational support.

Aims

The aims of this study are to assess levels of burnout and post-traumatic stress symptoms amongst paediatric oncology staff and to evaluate the impact of: i) individual resiliency factors (psychological flexibility, experiential avoidance, and personal coping) and ii) organisational support services, and iii) to investigate how psychological flexibility is associated with the likelihood of engaging with organisational support services. It is hypothesised that psychological flexibility and experiential avoidance may play a significant role in levels of burnout, symptoms of post-traumatic stress, and individual coping strategies, as well as the propensity to engage with organisational support strategies. This may help in understanding the methods implemented by paediatric oncology staff, which may be valuable in informing the development of interventions for these staff.

Method

Sample Size Calculation

A priori sample size calculations were conducted using G*Power software, version 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009). Correlational analysis effect sizes were based on studies which have examined burnout in oncology and other healthcare staff e.g. (Duarte & Pinto-Gouveia, 2017; Iglesias et al., 2010). These studies found correlation coefficients between burnout and independent variables explored in this study between 0.47 and 0.53. G*Power calculations suggested that a sample size of between 23 and 30 participants would be sufficient to detect similar correlations in the present study.

For the regression analyses, (Cohen, 1988) recommends a sample size of 39 for would be sufficient to detect a similar effect size as the regression model used by Bragard et al., (2012) ($R^2 = 0.43$) with six predictors, alpha of 0.05 and power of 0.8.

Design and Participants

A portfolio of relevant questionnaires was created using Qualtrics® (a secure online survey platform). Paediatric oncology staff were invited to complete the measures between November 2017 and April 2018. Nurses, healthcare assistants, and physicians from five hospitals in England and Wales, UK were initially invited to participate via link professionals at each site. However, to increase recruitment, the questionnaire was subsequently distributed through national professional groups.

Participants who completed the questionnaire were offered a chance to enter a draw to win a £100 voucher by entering their email address on a secure external database separate to the questionnaire data. In total, 77 staff working in paediatric oncology full-time and for a minimum of one year were recruited.

Before data were collected, ethical approval was sought and obtained from Cardiff University School of Psychology Research Ethics Committee. Permission to approach NHS staff at the research sites and via national professional groups was obtained from the NHS Health Research Authority.

Measures

Participants were asked for demographic and occupational information but were not asked for their hospital name or a geographical region to ensure participants remained anonymous and to encourage recruitment. Six further sections followed this: the abbreviated Maslach Burnout Inventory (aMBI; Maslach & Jackson, 1981; McManus, Winder, & Gordon, 2002) to measure burnout, the Trauma Screening Questionnaire (TSQ; Brewin et al., 2002) to screen for post-traumatic stress symptoms; the Comprehensive Assessment of Acceptance and Commitment Therapy processes (CompACT; Francis, Dawson, & Golijani-Moghaddam, 2016) to measure psychological flexibility; the Acceptance and Action Questionnaire–II (AAQ-II; Bond et al., 2011) to measure experiential avoidance; the Brief COPE questionnaire (Charles S Carver, 1997) to measure individual coping, and an organisational coping list adapted from Colville and colleagues (2015).

The abbreviated Maslach Burnout Inventory (aMBI) was utilised to reduce time demands of completing the questionnaire. This nine-item questionnaire uses three subscales to assess the three domains of burnout: emotional exhaustion (EE) [three items]; depersonalisation (DP) [three items]; and low personal accomplishment (low PA) [three items]. Analysis shows that it retains the factor structure of the full MBI (McManus, Winder, & Gordon, 2018), and has been used worldwide (e.g., Langade et al., 2016; McManus, Keeling, & Paice, 2004; Zuraida & Zainal, 2015) to assess burnout in thousands of healthcare staff. Each item is scored from 0 indicating "never" to 6 indicating "every day" (see Appendix 2). To facilitate comparison with full MBI scores, the aMBI scores were pro-rated by dividing each subscale score by three (the number of items per subscale) and multiplying by the equivalent number of subscale items in the full MBI (9 for EE; 5 for DA; 8 for low PA), in replication of Colville and colleagues (2017). In the current study, the average inter-item correlations for EE (0.57), DP (0.43), and low PA (0.23) all fell within the recommended range for adequate internal consistency (see Briggs & Cheek, 1986).

Research into the MBI suggests that high EE and high DP are sufficient to detect burnout (Schaufeli et al., 2001; Taris et al., 2005b). Therefore, participants in this study were defined as showing burnout if they had high scores on either the EE or DP subscales. High scores on the MBI subscales were based on the recommended cut-off points provided by the authors of the full MBI (Maslach et al., 1996): emotional exhaustion $\geq$ 27, depersonalisation $\geq$ 10, low personal accomplishment $\leq$ 33.

Adapted from the Post-traumatic Stress Disorder (PTSD) Symptom Scale (PSS-SR; Foa, Riggs, Dancu, & Rothbaum, 1993), the Trauma Screening Questionnaire (TSQ) is a ten item measure used to assess re-experiencing and arousal symptoms associated with PTSD. Six or more positive responses mean that the client is at risk of having PTSD according to the DSM criteria (Brewin et al., 2002). The measure was designed to be used one month or more post exposure

to a traumatic incident event to identify individuals experiencing current PTSD or at risk of future PTSD (Brewin et al., 2002). In the initial validation of the measure, performance on the TSQ was found to be "equivalent to agreement achieved between two full clinical interviews" (Brewin et al., 2002, p158). The TSQ has subsequently been found to be an effective predictor of PTSD with high sensitivity and specificity (de Bont et al., 2015; Walters, Bisson, & Shepherd, 2007). NICE guidelines state that the TSQ and the SPAN measure (Meltzer-Brody, Churchill, & Davidson, 1999) show the greatest potential for routine use in primary care health settings where detection of possible PTSD is warranted (NICE, 2005). While the TSQ is not a diagnostic tool, participants reporting ≥6 answers as "yes" suggests that they are at risk of having PTSD according to the DSM (American Psychiatric Association, 1994) criteria (Brewin et al., 2002) (see Appendix 6). In the current study, the scale showed good internal consistency with a Cronbach alpha coefficient of 0.90.

The Comprehensive Assessment of Acceptance and Commitment Therapy processes (CompACT) measure provides a total score (0-138) and three subscale scores as follows: Openness to Experience (0-60), which rates an individual's willingness to experience thoughts, feelings, and physical sensations without attempting to evade or control them; Behavioural Awareness (0-30), which rates how well an individual can stay mindful to their present actions; Valued Action (0-48), which rates how much someone engages in meaningful activities that are in line with the individual's values (Francis et al., 2016). Higher scores indicate greater psychological flexibility (see Appendix 3). In the current study, the scale showed good internal consistency with a Cronbach alpha coefficient of 0.74. For the Acceptance and Action Questionnaire-II (AAQ-II), which measures experiential avoidance on a scale of 0 - 49, higher scores indicate a greater degree of experiential avoidance (see Appendix 4). In the current study, the scale also showed good internal consistency with a Cronbach alpha coefficient of 0.92.

The Brief COPE domains of self-distraction, active coping, substance use (e.g., alcohol or drugs), and use of emotional support were included in the questionnaire. Active coping describes proactively taking steps to eliminate or bypass a stressor, or to reduce its impact (Carver, Scheier, & Weintraub, 1989). Each item is scored from 1 = "I usually don't do this at all" to 4 = "I usually do this a lot." With two items per domain, participant domain scores range from 2 – 8 (see Appendix 5). In the current study, Cronbach alpha coefficients were as follows: self-distraction, 0.71; active coping, 0.80; substance use, 0.91; and use of emotional support, 0.85.

Adapted from Colville et al., (2015), organisational coping strategy questions asked participants about the availability and staff usage of and/or desire to use: debriefs, well-being training, NHS support services, one-to-one and group reflection, one-to-one and team use of a

Clinical Psychologist, and use of mentor or buddy systems. NICE guidelines state that individual debriefs do not reduce the risk of developing PTSD, and in one case debriefs were found to increase the risk of PTSD one year post traumatic incident (NICE, 2005). Furthermore, there is suggestion that debriefs *immediately* post traumatic incidents increase the risk of individuals later experiencing PTSD (Rose & Wessely, 2002). Although debriefing is not recommended for the general public after traumatic incidents, in health care settings it is widely used & widely advocated (Gunasingam, Burns, Edwards, Dinh, & Walton, 2015; Salas et al., 2008). To categorise the endorsement of each organisational coping strategy, actual usage (i.e., selecting "Yes, and I make use of it") or receptivity to use (i.e., selecting "No/I don't know, but I would use it if it was available") were recorded. This resulted in participants being assigned a score of one for each coping strategy they reporting using or reported they would use if it was available. This gave each participant a score ranging from 0 - 8 once all eight strategies were answered. Higher scores suggest greater usage and receptivity to engaging with organisation support systems (see Appendix 7).

Statistics

All statistical calculations were performed using SPSS 23. Descriptive statistics included frequencies and percentages for categorical variables, and means and standard deviations for quantitative variables. Differences between the means of the professional groups were assessed using one-way ANOVA. To address the hypotheses that psychological flexibility and experiential avoidance may play a significant role in levels of burnout, post-traumatic stress symptoms, and individual coping strategies, as well as the propensity to engage with organisational support strategies, Spearman's rho correlation coefficient was used to look at the relationships between the different measures and subscales. This statistical test was used on all correlation analyses as the data in each measure was ordinal and non-normally distributed. As recommended (Dyrbye, West, & Shanafelt, 2009; Maslach et al., 1996), multiple regression analysis (rather than logistic regression) was used to assess the degree to which psychological flexibility and post-traumatic stress symptoms explain burnout scores (EE and DP). All statistical analysis was overseen by a statistician independent to the research study.

Results

Demographic and Occupational Information

Full data sets were collected for 77 participants. Of these, 69 (89.6%) identified as women, seven (9.1%) identified as men, and one (1.3%) identified their gender as other. The majority of the sample was between the ages of 31-50 years (53.6%). Fifty-eight (75.3%) were married or living with a partner, two (2.6%) had a partner with whom they were not living, and 17 (22.1%) were single. Five (6.5%) healthcare assistants, 60 (77.9%) nurses, and 12 (15.6%) physicians took part. Participants with a low and high number of years working in oncology were well represented by the sample, with the largest number of participants having worked in oncology for 6 - 10 or 21+ years (see Table 1).

Table 1. Demographic and occupational participant information.

	Healthcare Assistant		Nurse		Physician		Total	
Gender Identify With	N	%	N	%	N	%	N	%
Female	4	75	59	98.3	6	50.0	69	89.6
Male	1	25	1	1.7	5	41.7	7	9.1
Trans*	0	0	0	0	0	0	0	0
Other	0	0	0	0	1	8.3	1	1.3
Prefer not to disclose	0	0	0	0	0	0	0	0
Age								
18-25	0	0	9	15.0	0	0	9	11.7
26-30	1	20.0	11	18.3	0	0	12	15.6
31-40	1	20.0	16	26.7	2	16.7	19	24.7
41-50	0	0	15	25.0	7	58.3	22	28.9
51-60	1	20.0	8	13.3	3	25.0	12	15.6
61-70	2	40.0	1	1.7	0	0	3	3.9
Relationship Status								
Single	3	60.0	12	20.0	2	16.7	17	22.1
Married	1	20.0	37	61.7	10	83.3	48	62.3
Partner who live with	1	20.0	9	15.0	0	0	10	13.0
Partner who don't live with	0	0	2	3.3	0	0	2	2.6
Years in Oncology								
1	0	0	6	10.0	0	0	6	7.8
2-5	3	60.0	11	18.3	0	0	14	18.2
6-10	1	20.0	15	25.0	2	16.7	18	23.4
11-15	0	0	4	6.7	1	8.3	5	6.5
16-20	0	0	11	18.3	5	41.7	16	20.8
21+	1	20.0	13	21.7	4	33.3	18	23.4
Totals of Sample	5	6.5	60	77.9	12	15.6	77	100

Burnout

Mean scores for each of the MBI subscales were fairly consistent between groups (see Table 2), with no significant differences between the three professions for: EE, $F(2, 74) = 0.007$, $p = 0.993$, DP, $F(2, 10.65) = 1.606$, $p = 0.159$, or low PA, $F(2, 74) = 0.095$, $p = 0.909$. The proportion of participants with scores suggesting burnout was high; as indicated by the high EE subscale scores, approximately 50% of nurses and 40% of physicians were burnt-out. Eight (10.4%) participants had high scores on both the EE and DP subscales, with only one participant having a high DP score in the absence of a high EE score. In total 41 (51.9%) participants showed a high level of burnout (see Table 2).

Table 2. Mean and high abbreviated Maslach Burnout Inventory subscale scores.

	Healthcare Assistant		Nurse		Physician		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
aMBI Subscale Means								
Emotional Exhaustion	26.4	14.5	26.6	13.6	26.0	18.5	26.5	14.3
Depersonalisation	0.0	0.0	3.1	3.8	5.3	8.8	3.3	4.9
Low Personal Accomplishment	40.0	6.5	40.1	6.7	39.1	7.4	39.9	6.7
	N	%	N	%	N	%	N	%
aMBI Subscale High Scores								
Emotional Exhaustion	4	80.0	31	51.7	5	41.7	40	51.9
Depersonalisation	0	0	6	10.0	3	25.0	9	11.7
Low Personal Accomplishment	1	20.0	9	15.0	2	16.7	12	15.6

aMBI = abbreviated Maslach Burnout Inventory
Mean scores have been pro-rated to equivalent full MBI scores (Colville et al., 2017, see method)
aMBI recorded as high scores if emotional exhaustion ≥ 27, depersonalisation ≥ 10, low personal accomplishment ≤ 33 (Maslach et al., 1996)

Psychological Flexibility and Experiential Avoidance

The CompACT and AAQ-II and are not designed to have cut-off scores and as such, reflect the extent to which participants are psychologically flexible and experientially avoidant. Overall, mean CompACT total scores were 89.3 ± 18.9 and mean AAQ-II scores were 19.2 ± 8.5, see Table 3 for details. There were no significant differences between the three professions for the CompACT Total, $F(2, 74) = 0.34$, $p = 0.713$, or the AAQ-II, $F(2, 74) = 0.02$, $p = 0.982$.

Table 3. Mean AAQ-II and CompACT scores.

	Healthcare Assistant		Nurse		Physician		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
AAQ-II (0-49)	18.6	8.9	19.3	8.8	19.0	7.6	19.2	8.5
CompACT								
Openness to Experience (0-60)	36.0	12.1	34.4	9.7	37.4	11.2	35.0	10.0
Behavioural Awareness (0-30)	18.6	7.3	17.2	6.2	20.2	7.1	17.7	6.4
Valued Action (0-48)	39.6	2.7	36.9	6.6	34.3	12.5	36.6	7.6
CompACT Total (0-138)	94.2	20.5	88.4	18.8	91.8	19.8	89.3	18.9

AAQ-II = Acceptance and Action Questionnaire – II. Higher scores indicate greater experiential avoidance
CompACT = Comprehensive assessment of Acceptance and Commitment Therapy processes. Higher scores indicate greater psychological flexibility

Post-Traumatic Stress

Overall, with a mean score of 2.3 ±3.0, 13% of the participants had scores suggesting that they may be at risk of post-traumatic stress. This was most prevalent in nurses (N = 9, 15%), with one physician meeting the same criteria (see Table 4). Of these ten staff members, nine showed high levels of burnout on the EE subscale, three on the DP subscale, and two on the low PA subscale.

Table 4. Mean Trauma Screening Questionnaire scores and risk of post-traumatic stress.

	Healthcare Assistant		Nurse		Physician		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
TSQ Score (0-10)	1.8	2.0	2.2	3.0	1.8	2.9	2.3	3.0
	Total	%	Total	%	Total	%	Total	%
Risk of post-traumatic stress indicated*	0	0	9	15	1	8.3	10	13.0

TSQ = Trauma Screening Questionnaire (post-traumatic stress)
*≥6 items marked yes indicates significant risk of post-traumatic stress

Associations between Burnout, Psychological Flexibility, Experiential Avoidance, and Post-Traumatic Stress

Table 5 presents correlations found to be statistically significant. Spearman's rho correlation analysis indicated moderate correlations between EE and AAQ-II (r = 0.430, p < 0.01) and TSQ (r = 0.389, p < 0.01), suggesting that those with higher levels of burnout on the MBI emotional exhaustion subscale were more likely to be experientially avoidant and to show a greater risk of post-traumatic stress. Moderate negative correlations were found between CompACT Total and EE (r = -0.481, p < 0.01), DP (r = -0.365, p < 0.01), and TSQ (r = -0.419, p < 0.01), suggesting

participants with greater psychological flexibility were less likely to be burnt-out on the MBI emotional exhaustion and depersonalisation subscales, and show lower risk of post-traumatic stress. AAQ-II showed large correlations with TSQ ($r = 0.581$, $p < 0.01$) indicating that those who were experientially avoidant were more likely to show greater risk of post-traumatic stress.

Table 5. Significant Spearman's rho correlations between aMBI, AAQ-II, CompACT, and TSQ.

	aMBI EE	aMBI DP	aMBI low PA	AAQ-II	CompACT Total	TSQ
aMBI EE	1	0.549**	-0.159	0.430**	-0.481**	0.389**
aMBI DP		1	-0.062	0.217	-0.365**	0.170
aMBI low PA			1	-0.105	0.119	0.017
AAQ-II				1	-0.577**	0.581**
CompACT Total					1	-0.419**
TSQ						1

**correlation is significant at the 0.01 level (2 tailed)
aMBI = abbreviated Maslach Burnout Inventory, EE = Emotional Exhaustion subscale (burnout), DP = Depersonalisation subscale, low PA = Low Personal Accomplishment subscale
TSQ = Trauma Screening Questionnaire (risk of post-traumatic stress)
AAQ-II = Acceptance and Action Questionnaire-II (experiential avoidance)
CompACT = Comprehensive assessment of Acceptance and Commitment Therapy processes (psychological flexibility)

Individual Coping and Organisational Support Strategies

Active coping and self-distraction were the highest scoring self-reported methods of coping, closely followed by making use of emotional support. Substance use in the form of alcohol or drugs was the least used method of coping. The organisational support strategy used most frequently by staff were attending debriefs (50.6%) and clinical psychologist team input (27.3%), see Table 6. Table 7 shows there were no clear correlations between participant usage or desire to use organisation support strategies and psychological flexibility (CompACT) or experiential avoidance (AAQ-II). However, usage or desire to use organisation support strategies showed a small correlation with active coping ($r = 0.226$, $p < 0.05$). CompACT subscales OE ($r = 0.278$, $p < 0.05$), VA ($r = 0.415$, $p < 0.01$), and Total ($r = 0.345$, $p < 0.01$), and AAQ-II ($r = -0.290$, $p < 0.05$) scores were associated with active coping. Those who were more experientially avoidant were more likely to use substances to cope ($r = 0.356$, $p < 0.01$), and to not attend well-being training ($r = -0.350$, $p < 0.01$). Participants reporting that they attend debriefs correlated with higher psychological flexibility as shown by the correlations with CompACT subscales OE ($r = 0.236$, $p < 0.05$), VA ($r = 0.302$, $p < 0.01$), and Total ($r = 0.317$, $p < 0.01$), see Table 7 for details.

Table 6. Brief COPE mean scores and organisational coping strategy usage.

	Healthcare Assistant		Nurse		Physician		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Brief COPE								

	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Self-distraction (2-8)	5.4	0.9	5.5	1.6	5.3	1.3	5.4	1.5
Active coping (2-8)	7.2	1.1	5.6	1.9	5.5	1.8	5.7	1.8
Substance use (2-8)	2.8	1.1	2.9	1.4	3.0	1.8	2.9	1.5
Use of emotional support (2-8)	5.4	2.3	4.9	1.8	4.3	2.1	4.8	1.9
	N	%	N	%	N	%	N	%
Use of Organisational Strategies								
Debrief	4	80.0	31	51.7	4	33.3	39	50.6
Well-being training	1	20.0	13	21.7	0	0	14	18.2
NHS support services	1	20.0	6	10.0	0	0	7	9.1
One-to-one reflection	0	0	14	23.3	2	16.7	16	20.8
Group reflection	0	0	9	15.0	4	33.3	13	16.9
Psychologist team input	1	20.0	14	23.3	6	50.0	21	27.3
One-to-one psychologist input	0	0	6	10.0	3	0	9	11.7
Mentor/Buddy	1	20.0	12	20.0	0	0	13	16.9
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Total usage of or desire for organisational support score*	4.2	1.9	3.5	1.9	2.8	1.3	3.4	1.8

*If organisational coping strategies existed and participants reported making use of it, or that they would use it if it were available, participants were given a score of one for each coping strategy. As there were eight items, participants each received a score ranging 0 – 8. Higher scores suggest greater usage and receptivity to engaging with organisation support systems

Regarding burnout, those with high EE subscale scores were less likely to engage in active coping (r = -0.370, p < 0.01), make use of debriefs (r = -0.368, p < 0.01), and to have attended well-being training (r = -0.314, p < 0.01). Participants with higher EE scores were also more likely to use substances as a coping method (r = 0.239, p < 0.05). Participants with high DP subscale scores were less likely to engage in active coping (r = -0.270, p < 0.05) and to make use of debriefs (r = -0.325, p < 0.01). Individuals with low PA scores were less likely to make use of group reflection (r = 0.274, p < 0.05) and less likely to use organisation support strategies or have a desire for them to be available (r = 0.237, p < 0.05), see Table 7 for details.

Table 7 also shows that levels of post-traumatic stress symptoms were lower in participants who used active coping (r = -0.299, p < 0.01), attended well-being training (r = -0.236, p < 0.05) and used group reflection (r = -0.226, p < 0.05). However, higher levels of post-traumatic stress symptoms were found in those who more frequently used substances to cope.

Table 7. Significant Spearman's rho correlations between aMBI, TSQ, AAQ-II, CompACT, Brief COPE, and organisational coping strategies.

	aMBI EE	aMBI DP	aMBI low PA	TSQ	AAQ-II	CompACT OE	CompACT BA	CompACT VA	CompACT Total
Brief Cope									
Self-distraction	0.138	0.127	0.138	0.071	0.111	-0.163	-0.125	0.077	-0.078
Active coping	-0.370**	-0.270*	0.205	-0.299**	-0.227*	0.295**	0.207	0.416**	0.377**
Substance use	0.239*	0.092	0.165	0.254*	-0.374**	-0.198	-0.168	-0.118	-0.203
Emotional support	-0.053	-0.163	0.004	-0.069	0.067	0.073	-0.006	0.311**	0.144
Organisational Strategies									
Debrief	-0.368**	-0.325**	0.181	-0.202	-0.201	-0.248**	0.254*	0.295**	0.343**
Well-being training	-0.314**	-0.123	-0.052	-0.236*	-0.350**	0.102	-0.124	0.145	0.054
NHS support services	-0.087	-0.033	-0.057	-0.009	-0.055	-0.020	-0.043	0.037	-0.014
One-to-one reflection	-0.077	-0.043	-0.075	-0.111	-0.087	0.121	0.056	0.198	0.143
Group reflection	-0.152	-0.151	0.274*	-0.226*	-0.036	0.196	0.142	0.016	0.161
Total usage of or desire for organisational support score	-0.079	0.064	0.237*	0.008	0.006	0.047	0.031	0.063	-0.009

**correlation is significant at the 0.01 level (2 tailed)

*correlation is significant at the 0.05 level (2 tailed)

aMBI = abbreviated Maslach Burnout Inventory, EE = Emotional Exhaustion subscale, DP = Depersonalisation subscale, low PA = Low Personal Accomplishment subscale

TSQ = Trauma Screening Questionnaire (risk of post-traumatic stress)

AAQ-II = Acceptance and Action Questionnaire – II (experiential avoidance)

CompACT = Comprehensive assessment of Acceptance and Commitment Therapy processes (psychological flexibility), OE = Openness to Experience subscale, BA = Behavioural Awareness subscale, VA = Valued Action subscale

Burnout, Post-traumatic Stress Symptoms, Experiential Avoidance and Psychological Flexibility

Regression Analysis

Standard multiple regression was used to assess the ability of psychological flexibility (CompACT Total) and experiential avoidance (AAQ-II) to predict levels of burnout (EE and DP) and post-traumatic stress symptoms (TSQ). Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. In relation to burnout, CompACT Total scores and AAQ-II scores explained 26.3% of the total variance in EE, $R^2 = 0.28$, $F(2, 74) = 14.58$, $p < 0.001$. CompACT Total significantly predicted EE (unstandardised beta = -0.082, $p = 0.014$), as did AAQ-II (unstandardised beta = 0.145, $p = 0.048$). Individually, CompACT Total explained 23.3% of the total variance in EE, $R^2 = 0.24$, $F(2, 74) = 24.14$, $p < 0.001$, and AAQ-II explained 21.0% of the total variance in EE, $R^2 = 0.22$, $F(2, 74) = 21.24$, $p < 0.001$. Again, both significantly predicted EE (CompACT, unstandardised beta = -0.124, $p = 0.014$, AAQ-II unstandardised beta = 0.263, $p < 0.001$). CompACT Total scores and AAQ-II scores explained 16.9% of the total variance in DP, $F(2, 74) = 8.73$, $p < 0.001$. CompACT Total was statistically significant in predicting DP (unstandardised beta = -0.083, $p = 0.001$). However, AAQ-II was not statistically significant in predicting DP (unstandardised beta = -0.066, $p = 0.165$).

In relation to post-traumatic stress symptoms (TSQ), psychological flexibility (CompACT Total) and experiential avoidance (AAQ-II) explained 34.5% of the total variance in post-traumatic stress symptom scores (TSQ), $F(2, 74) = 21.00$, $p < 0.001$. CompACT Total was not statistically significant in predicting TSQ scores (unstandardised beta = -0.013, $p = 0.492$). However, AAQ-II score was statistically significant in predicting TSQ scores (unstandardised beta = 0.188, $p = 0.001$).

Discussion

The findings from the study support concerns that oncology care professionals experience significant levels of burnout (Catt et al., 2005) and suggest that these concerns can be expanded to paediatric oncology staff. While the findings of the study presented here are somewhat similar to previous paediatric oncology burnout research with regard to depersonalisation and low personal accomplishment MBI subscale scores (Liakopoulou et al., 2008; Roth et al., 2011), this study's mean rate of high emotional exhaustion (51.9%) is considerably higher. While it is clear that a significant proportion of oncology staff experience burnout, the variability of burnout scores across different studies demonstrates a growing realisation amongst the wider literature attesting to the heterogeneity of burnout scores across the field of oncology.

This study demonstrated associations between burnout and psychological flexibility, experiential avoidance, and levels of post-traumatic stress symptoms. In the wider healthcare literature, burnout and PTSD appear to be strongly linked. Research has found that almost all nurses meeting the diagnostic criteria for PTSD were also burnt-out. However, only 21% of the nurses who were experiencing burnout met the diagnosis for PTSD (Mealer et al., 2009). Outside of healthcare, higher rates of burnout has been shown to be positively correlated with a diagnosis of PTSD in fire-fighters and ambulance staff (Katsavouni, Bebetsos, Malliou, & Beneka, 2016; Mitani, Fujita, Nakata, & Shirakawa, 2006).

In the present study, staff who showed greater psychological flexibility and less experiential avoidance showed lower burnout. Similar results regarding burnout were found amongst Spanish nurses (Iglesias et al., 2010) and Portuguese oncology staff (Duarte & Pinto-Gouveia, 2017). This suggests that psychological flexibility and experiential acceptance may offer some protection from burnout. It is theorised that psychological inflexibility and experiential avoidance drain an individual's psychological resources through the continued attempts to control thoughts and feelings. In doing so, these individuals struggle to attend to the environment around them, are less well equipped to perform their role, and experience a reduction in psychological well-being (Lloyd, Bond, & Flaxman, 2013). Lloyd and colleagues (2013) propose that psychological inflexibility leads to burnout through emotional exhaustion, which in turn results in depersonalisation (Lloyd et al., 2013).

This has promising implications as psychological flexibility is a skill set that can be easily disseminated to staff using approaches utilised in third wave Cognitive Behaviour Therapy (CBT) interventions such as Acceptance and Commitment Therapy (ACT; Waters, Frude, Flaxman, & Boyd, 2018). Researchers have conducted studies demonstrating that psychological flexibility skills training mediates reductions in burnout (Hayes et al., 2004) (Lloyd et al., 2013). Studies have shown evidence of efficacious ACT skills training across a number of different staff groups in education

(Franco, Mañas, Cangas, Moreno, & Gallego, 2010), healthcare (Foureur, Besley, Burton, Yu, & Crisp, 2013) and social work (Brinkborg, Michanek, Hesser, & Berglund, 2011). There also appears to be a diverse range of mediums through which this training can be administered (Brown, Glendenning, Hoon, & John, 2016; Waters et al., 2018). Of particular interest, is the potential to utilise the extensive use of smartphones. For example, Kaipainen, Välkkynen, & Kilkku, (2017) demonstrated the use of an ACT app for Finish nurses with depression. Development in this area could allow individuals to download psychological flexibility training skills apps and to access them easily at a convenient time.

While the TSQ is not a diagnostic tool for PTSD, over 13% of the participants displayed symptoms suggesting significant levels of post-traumatic stress symptoms, and almost all the staff who met this criteria also showed high levels of burnout. Greater psychological flexibility and less experiential avoidance were associated with fewer symptoms of post-traumatic stress. While causation cannot be implied, literature suggests that some problematic behaviours carried out by people with PTSD may be due to avoidance, and viewing thoughts as facts (cognitive fusion; Walser & Hayes, 2006). Future research should explore the efficacy of increasing psychological flexibility and reducing experiential avoidance to protect staff from post-traumatic stress.

Experiential avoidance describes the cognitive and behavioural avoidance individuals engage in to evade distress. There are parallels between these concepts and Ehlers and Clark (2000) cognitive model of PTSD. The authors describe how the ability to change both trauma memories and negative appraisals of traumatic events are hindered by problematic behavioural and cognitive strategies (Ehlers and Clark, 2000). They propose that individuals experience PTSD due to the manner in which the event is processed eliciting a serious neuro-biological state of current threat, despite the event taking place months, or even years previously. Perceiving the threat as current results in high states of arousal, anxiety, and disturbing thoughts or feelings. The individual engages in behavioural and cognitive responses in an effort to reduce the distress experienced and/or remove the perceived threat. However, while this may provide short-term relief, it prevents the individual from experiencing the cognitive shift to overcome the PTSD (Ehlers and Clark, 2000). Indeed, thought suppression, safety behaviours, and avoidance have been found to predict maintenance of PTSD symptoms (Dunmore et al., 1999; Ehlers et al., 1998a, 1998b).

The present study expands the knowledgebase regarding associations between psychological flexibility/experiential avoidance and post-traumatic stress symptoms, and suggests a possible preventative or protective utility. Wider research has demonstrated Eye Movement Desensitization and Reprocessing (EMDR) therapy and Trauma-Focused Cognitive Behavioural Therapy (TF-CBT) as effective interventions for individuals with PTSD (Bisson, et al., 2013; Ehlers et al., 2005; Ehlers and Clark, 2008; Watts et al., 2013). Where symptoms of PTSD have been present for three months or

more post the trauma event, NICE Guidelines (2005) state that either of these interventions should be offered.

In the present study, specific coping styles were associated with higher levels of burnout and post-traumatic stress symptoms. Higher emotional exhaustion scores were more likely in staff who used substances as a coping method. Lower emotional exhaustion scores were more common in staff who engaged in active coping, debriefs, and well-being training. Depersonalisation scores were also lower in staff who utilised active coping and debriefs. This supports research that debriefs reduce the risk of healthcare staff experiencing burnout (Gunasingam et al., 2015).

Those who used active coping, and attended well-being and group reflection showed lower levels of post-traumatic stress symptoms; while these levels were highest amongst staff who used substances more frequently to cope. This suggests that more experiential acceptant forms of coping may reduce the chance of developing burnout and PTSD. These coping styles may also increase resilience. This is consistent with research which suggests that greater mindfulness and resilience is associated with lower levels of burnout and secondary traumatic stress (Harker et al., 2016). The author's findings also indicate that organisational coping strategies seem to be a worthwhile investment in reducing burnout and PTSD. Interestingly however, psychological flexibility did not appear to be associated with receptivity to engaging in organisational support systems.

Limitations

As with all self-report psychometrics, there is a possibility that the measures contained within the online questionnaire under/over-report burnout and post-traumatic stress symptoms. The questionnaire was anonymous, and as such, it is not possible to know which data came from which source. Therefore, comparison and analysis of between-group factors were not possible. By its very nature, burnout may reduce motivation to carry out tasks such as completion of the questionnaire. This may have disguised the true level of burnout experienced by paediatric oncology staff. In addition, the study did not capture information on job stress; while the direction is unclear, research suggests job stress is associated with higher levels of burnout (Diggens & Chesson, 2014; Elit et al., 2004; Leung & Rioseco, 2017). Also, while proportions of different professions that completed the questionnaire are typical of oncology teams, 77.9% of the data was obtained from nurses, and as such, the data provided a biased representation. Overall, the generalisability of the findings is limited by the small sample size and UK based population. Nonetheless, this study provides valuable insight into the interrelation between burnout and post-traumatic stress symptoms, and individual and organisational coping strategies in paediatric oncology.

Conclusion

There is a lack of research exploring burnout and post-traumatic stress in paediatric oncology staff (Mukherjee et al., 2009). This study provides a valuable insight into rates of burnout and post-traumatic stress symptoms amongst professionals working in paediatric oncology in the UK. The research suggests this is a professional group struggling with significant levels of work-related distress which is a concern for the profession and future sustainability. However, this paper has illustrated that organisational support systems, psychological flexibility, and experiential acceptance may protect individuals from burnout and post-traumatic stress. Further research regarding the provision of interventions which increase psychological flexibility amongst paediatric oncology staff is warranted.

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Maslach Burnout Inventory and Abbreviated Maslach Burnout Inventory

The full Maslach Burnout Inventory measure is under copyright and cannot be reproduced here.

The abbreviated Maslach Burnout Inventory is accessible here:

https://www.nzgp-webdirectory.co.nz

Comprehensive Assessment of Acceptance and Commitment Therapy processes (CompACT) measure

Name:		Date:

Please rate the following 23 statements using the scale below:

0	1	2	3	4	5	6
Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Moderately agree	Strongly agree

Statement							
1. I can identify the things that really matter to me in life and pursue them	0	1	2	3	4	5	6
2. One of my big goals is to be free from painful emotions	0	1	2	3	4	5	6
3. I rush through meaningful activities without being really attentive to them	0	1	2	3	4	5	6
4. I try to stay busy to keep thoughts or feelings from coming	0	1	2	3	4	5	6
5. I act in ways that are consistent with how I wish to live my life	0	1	2	3	4	5	6
6. I get so caught up in my thoughts that I am unable to do the things that I most want to do	0	1	2	3	4	5	6
7. I make choices based on what is important to me, even if it is stressful	0	1	2	3	4	5	6
8. I tell myself that I shouldn't have certain thoughts	0	1	2	3	4	5	6
9. I find it difficult to stay focused on what's happening in the present	0	1	2	3	4	5	6
10. I behave in line with my personal values	0	1	2	3	4	5	6
11. I go out of my way to avoid situations that might bring difficult thoughts, feelings, or sensations	0	1	2	3	4	5	6
12. Even when doing the things that matter to me, I find myself doing them without paying attention	0	1	2	3	4	5	6
13. I am willing to fully experience whatever thoughts, feelings and sensations come up for me, without trying to change or defend against them	0	1	2	3	4	5	6
14. I undertake things that are meaningful to me, even when I find it hard to do so	0	1	2	3	4	5	6
15. I work hard to keep out upsetting feelings	0	1	2	3	4	5	6
16. I do jobs or tasks automatically, without being aware of what I'm doing	0	1	2	3	4	5	6
17. I am able to follow my long terms plans including times when progress is slow	0	1	2	3	4	5	6
18. Even when something is important to me, I'll rarely do it if there is a chance it will upset me	0	1	2	3	4	5	6
19. It seems I am "running on automatic" without much awareness of what I'm doing	0	1	2	3	4	5	6
20. Thoughts are just thoughts – they don't control what I do	0	1	2	3	4	5	6
21. My values are really reflected in my behaviour	0	1	2	3	4	5	6
22. I can take thoughts and feelings as they come, without attempting to control or avoid them	0	1	2	3	4	5	6
23. I can keep going with something when it's important to me	0	1	2	3	4	5	6

Acceptance and Action Questionnaire-II

AAQ-II

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1.	My painful experiences and memories make it difficult for me to live a life that I would value.	1 2 3 4 5 6 7
2.	I'm afraid of my feelings.	1 2 3 4 5 6 7
3.	I worry about not being able to control my worries and feelings.	1 2 3 4 5 6 7
4.	My painful memories prevent me from having a fulfilling life.	1 2 3 4 5 6 7
5.	Emotions cause problems in my life.	1 2 3 4 5 6 7
6.	It seems like most people are handling their lives better than I am.	1 2 3 4 5 6 7
7.	Worries get in the way of my success.	1 2 3 4 5 6 7

This is a one-factor measure of psychological inflexibility, or experiential avoidance. Score the scale by summing the seven items. Higher scores equal greater levels of psychological inflexibility.

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Brief COPE measure as presented in the online questionnaire (Qualtrics)

School of Psychology

There are lots of ways to try to deal with stress. These questions ask you to indicate what you do and feel, when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress.

Please indicate below what you usually do when you experience a stressful event. There are no right or wrong answers, so choose the most accurate answer for you, not what you think 'most people' would say or do, or what you think you should say or do.

	I usually don't do this at all	I usaully do this a little bit	I usually do this a medium amount	I usually do this a lot
I turn to work or other activities to take my mind of things	O	O	O	O
I concentrate my efforts on doing something about the situation I'm in	O	O	O	O
I use alcohol or other drugs to make myself feel better	O	O	O	O
I try to get emotional support from others	O	O	O	O
I try to take action to make a situation better	O	O	O	O
I use alcohol or drugs to help me get through it	O	O	O	O
I seek comfort and understanding from someone	O	O	O	O
I do something to think about it less e.g. watch a film, go online, read, sleep, go shopping	O	O	O	O

Trauma Screening Questionnaire as presented in the online questionnaire (Qualtrics)

Not including things that happened during the last month, please think about what for you has been the most traumatic experience since working in paediatric oncology

Roughly when did this occur?

- ○ 1 - 2 months ago
- ○ 3-6 months ago
- ○ 6-12 months ago
- ○ 1-2 years ago
- ○ 3-4 years ago
- ○ 5-10 years ago
- ○ 10+ years ago

With that same *most traumatic experience* in mind, please consider if you have experienced any of the following **at least twice in the past week**:

	Yes	No
Upsetting thoughts or memories about the event that have come into your mind against your will	○	○
Upsetting dreams about the event	○	○
Acting or feeling as though the event were happening again	○	○
Feeling upset by reminders of the event	○	○
Bodily reactions (such as fast heartbeat, stomach churning)	○	○
Difficulty falling or staying asleep	○	○
Irritability or outbursts of anger	○	○
Difficulty concentrating	○	○
Heightened awareness of potential dangers to yourself and others	○	○
Feeling jumpy or being startled by something unexpected	○	○

Example section the organisational coping questions as presented in
the online questionnaire (Qualtrics)

Organisational coping strategies

Please indicate if the following items are available at your place of work:

Debriefs

● Yes
○ No
○ I don't know

Please give more detail

● Yes, and I make use of it
○ Yes, but I don't make use of it

Training related to staff well-being

○ Yes
● No
○ I don't know

Please give more detail

○ No/I don't know, but I would attend if it was available
● No/I don't know, and I wouldn't attend if it was available

Example Initial Information and Consent to be Contacted Form

You have been invited to take part in a doctorate in clinical psychology research study focusing on oncology healthcare professionals working with children and young people. Before you decide if would like to take part it is important that you understand why the research is being done and what it will involve for you.

Reason for conducting this research

There is lots of evidence to suggest that oncology staff can be particularly susceptible to experiencing increased stress, as a direct result of the emotionally-demanding environment in which they work. This study is being conducted to find out more about the mediating impact of various strategies oncology staff working with children and young people might use to manage the emotional demands of the job. Whilst there is no direct benefit to taking part in this study, it is hoped that the findings will increase our understanding of the experiences of how oncology staff manage high levels of work-related stress. This knowledge could then inform the development of support services made available in this area. We very much hope that you will agree to participate.

Inclusion criteria – potential participants must

- Be working in oncology with children and young people (CYP) 0-25 years

- Have been working in oncology with CYP for at least one year

- Not be retired

What will happen if I take part?

You will be asked to complete a secure online survey. All responses to the survey will be confidential and no identifying data will be collected. The survey should take approximately 20 – 30 minutes to complete.

Do I have to take part?

Your participation in this study is entirely voluntary and a decision to not take part will not disadvantage you in any way. You are free to withdraw at any time. As data is confidential, it will not be possible to identify and withdraw your data after it has been entered in Qualtrics (the survey program).

What are the risks of taking part?

The research has been reviewed and approved by Cardiff University School of Psychology Ethics Committee. The questionnaire has been tested by Paediatric Oncology staff. It is not expected that this study will cause any distress, but should reflecting on the questionnaire items be upsetting, you are encouraged to seek support from your line manager, occupational health/staff well-being services, or GP.

How will information about me be used?

The results of the study will be written up as part of a clinical psychology doctoral thesis and may be published in professional journals and/or shared at relevant conferences. You will not be identified by name in any dissemination of the results. If you would like to view a copy of the final report of the study when it is completed, please bookmark the link at the end of the survey.

Who will have access to information about me?

Survey responses are confidential as the Qualtrics online survey system automatically generates numerical code for each participant. All research data will be stored in accordance with national policy and legislation (The Data Protection Act, 1998) and BPS ethics guidelines for Internet-mediated research (BPS, 2013). Any email addresses provided by participants will be stored in a separate password protected file that is not attached to their survey data. The researcher and research supervisor will have access to the electronic research data. Research data will be stored for 15 years after completion of the study for academic purposes in accordance with Cardiff University policy and destroyed thereafter.

What if there is a problem or you have further questions?

If you have a concern or require additional information about any aspect of this study, please contact the researcher or research supervisor. If you would like to complain about this project, please contact Reg Morris.

Researcher:
Matthew Yates, Trainee Clinical Psychologist - Email:
Research Supervisor:
Dr Victoria Samuel, Research Tutor - Email:
Complaints:
Reg Morris, DClinPsy Programme Director:

How do I take part?

If, after reading this Information Sheet, you would like to take part in study and complete the online questionnaire, please complete the consent boxes below and sign and date the form. Please return the form to Kerry-Ann Holder or the box on Rainbow ward. You will then receive an email including a link to the questionnaire.

Please put your initials in the boxes by the following statements and sign below to indicate that you are providing informed consent to participate in this research study:

I have read and understand the Information Sheet for this study Version 3.0, dated 03/10/17	☐
I consent to my personal email being given to the researcher so that they can email me a link to the online survey	☐
I consent for the researcher to send me a second reminder email approximately 2-3 weeks after I am sent the online survey link	☐

Email address (block capitals):………………………………….............

Signed: ………………………………….....................................

Name: ………………………………………………………………

Date: …………………………………….............................

First Page of Online Questionnaire on Qualtrics

Hello, you have been invited to take part in a doctorate in clinical psychology research study focusing on oncology healthcare professionals working with children and young people.

Before you decide if would like to take part it is important that you understand why the research is being done and what it will involve for you.

Reason for conducting this research

This study is being conducted to find out more about the mediating impact of various strategies oncology staff working with children and young people might use to manage the demands of the job. Whilst there is no direct benefit to taking part in this study, it is hoped that the findings will increase our understanding of the experiences of oncology staff. This knowledge could then inform the development of support services made available in this area. We very much hope that you will agree to participate.

What will happen if I take part?

You will be asked to complete a secure online survey. All responses to the survey will be confidential and no identifying data will be collected. The survey should take approximately 20 - 30 minutes to complete. At the end of the questionnaire you will be invited to enter a chance to win a £100 Amazon voucher for your participation.

Do I have to take part?

Your participation in this study is entirely voluntary and a decision to not take part will not disadvantage you in any way. You are free to withdraw at any time. As data is confidential, it will not be possible to identify and withdraw your data after it has been entered in Qualtrics (this survey program).

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How will information about me be used?

The results of the study will be written up as part of a clinical psychology doctoral thesis and may be published in professional journals and/or shared at relevant conferences. You will not be identified by name in any dissemination of the results. If you would like to receive a copy of the final report of the study when it is completed, please follow the link at the end of the survey.

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will be stored in a separate password protected file that is not attached to their survey data and will be destroyed after usage. The researcher and research supervisor will have access to the electronic research data. Research data will be stored for 15 years after completion of the study for academic purposes in accordance with Cardiff University policy and destroyed thereafter.

What if there is a problem or you have further questions?
If you have a concern or require additional information about any aspect of this study, please contact the researcher or research supervisor. If you would like to complain about this project, please contact Reg Morris.

Researcher:
Matthew Yates, Trainee Clinical Psychologist
Email:

Research Supervisor:
Dr Victoria Samuel, Senior Research Tutor
Email:

Complaints:
Reg Morris, Cardiff University DClinPsy Programme Director
Email:

Please declare below that you are providing informed consent

Research Project Insurance

Hasilwood House
60 Bishopsgate
London EC2N 4AW
Tel: 020 7847 8670
Fax: 020 7847 8689

UMAL

TO WHOM IT MAY CONCERN

18th July 2016

Dear Sir/Madam

**CARDIFF UNIVERSITY
AND ALL ITS SUBSIDIARY COMPANIES**

We confirm that the above Institution is a Member of U.M. Association Limited, and that the following covers are currently in place:-

EMPLOYERS' LIABILITY

Certificate No.	Y016458QBE0116A/165
Period of Cover	1 August 2016 to 31 July 2017
Limit of Indemnity	£50,000,000 any one event unlimited in the aggregate.
Includes	Indemnity to Principals
Cover provided by	QBE Insurance (Europe) Limited and Excess Insurers.

PUBLIC AND PRODUCTS LIABILITY

Certificate of Entry No.	UM165/13
Period of Cover	1 August 2016 to 31 July 2017
Includes	Indemnity to Principals
Limit Of Indemnity	£50,000,000 any one event and in the aggregate in respect of Products Liability and unlimited in the aggregate in respect of Public Liability.
Cover provided by	U.M. Association Limited and Excess Cover Providers led by Q Insurance (Europe) Limited

If you have any queries in respect of the above details, please do not hesitate to contact us.

Yours faithfully

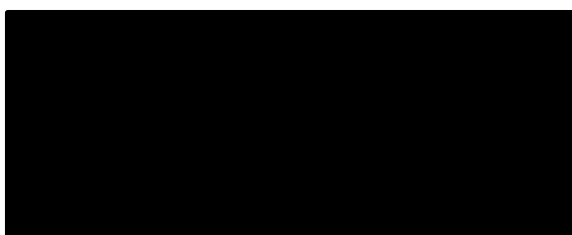Susan Wilkinson
For U.M. Association Limited

Cardiff University Sponsorship

Research and Innovation Services
Gwasanaethau Ymchwil ac Arloesi
Acting Director, Cyfarwyddwr Dros Dro Dr David G Bembo

Cardiff University
McKenzie House, 7ᵗʰ Floor
30-36 Newport Road
Cardiff CF24 0DE
Wales UK

Tel +44(0)29 2087 5834
Fax +44(0)29 2087 4189

2ⁿᵈ March 2017

Prifysgol Caerdydd
Tŷ McKenzie, 7ᶠᵉᵈ Llawr
30-36 Heol Casnewydd
Caerdydd CF24 0DE
Cymru, Y Deyrnas Unedig

Ffôn +44(0)29 2087 5834
Ffacs +44(0)29 2087 4189

Dear Dr Samuel,

Mediators of Burnout and Post-Traumatic Stress Disorder: a multi-site study of Oncology Professionals working with Children and Young People

I understand that you are acting as Academic Supervisor for the above DClinPsy project to be conducted by Matthew Yates.

I confirm that Cardiff University agrees in principle to act as Sponsor for the above project, as required by the Research Governance Framework for Health and Social Care.

Scientific Review
I can also confirm that Scientific Review has been obtained from the DClinPsy supervisory team.

Insurance
The necessary insurance provisions will be in place prior to the project commencement. Cardiff University is insured with UMAL. Copies of the insurance certificate are attached to this letter.

Approvals

On completion of your IRAS form (required for NHS R&D/HRA approval), you will be required to obtain signature from the Sponsor ('Declaration by the Sponsor Representative').

Please then submit the project to the following bodies for approval:
- Health & Care Research Wales Permissions Coordinating Unit (formerly known as NISCHR PCU) - to arrange host organisation R&D approval for Welsh NHS sites;
- The Health Research Authority (HRA)- to arrange HRA approval for any NHS sites in England;
- Other- Cardiff University School of Psychology Research Ethics Committee.

Once Research and Innovation Services has received evidence of the above approvals, the University is considered to have accepted Sponsorship and your project may commence.

Roles and Responsibilities
As Chief Investigator you have signed a Declaration with the Sponsor to confirm that you will adhere to the standard responsibilities as set out by the Research Governance Framework for Health and Social Care. In accordance with the University's Research Integrity & Governance Code of Practice, the Chief Investigator is also responsible for ensuring that each research team member is qualified and experienced to fulfill their delegated roles including ensuring adequate supervision, support and training.

Contracts

No research specific tasks delegated to NHS Host Organisation staff (staff acting as participants) – no contract required.

May I take this opportunity to remind you that, as Chief Investigator, you are required to:
- ensure you are familiar with your responsibilities under the Research Governance Framework for Health and Social Care;
- undertake the study in accordance with Cardiff University's Research Integrity & Governance Code of Practice (available on the Cardiff University Staff and Student Intranet) and the principles of Good Clinical Practice;
- ensure the research complies with the Data Protection Act 1998;
- where the study involves human tissue, ensure the research complies with the Human Tissue Act and the Cardiff University Code of Practice for Research involving Human Tissue (available on the Cardiff University Staff and Student Intranet);
- inform Research and Innovation Services of any amendments to the protocol or study design, including changes to start /end dates;
- co-operate with any audit, monitoring visit or inspection of the project files or any requests from Research and Innovation Services for further information.

You should quote the following unique reference number in any correspondence relating to Sponsorship for the above project:

SPON 1588-17

This reference number should be quoted on all documentation associated with this project.

Yours sincerely

Dr K J Pittard Davies
Head of Research Governance and Contracts
Direct line: +44 (0) 29208 79274
Email: resgov@cardiff.ac.uk

Cc   Matthew Yates.

Cardiff University School of Psychology Ethics Committee Approval

Ethics Feedback - EC.17.09.12.4942

psychethics
Mon 25/09/2017 15:41
To: Matthew Yates; Victoria Samuel ⌃

📤 ↩ Reply all | ⌄

Inbox

You replied on 25/09/2017 16:42.

💬 | Action Items

Dear Matthew

The Ethics Committee has considered your revised project proposal: *Mediators of Burnout and Post Traumatic Stress Disorder (EC.17.09.12.4942).*

The project has now been approved.

Please note that if any changes are made to the above project then you must notify the Ethics Committee.

Best wishes,
Mark Jones

Cardiff University School of Psychology Ethics Committee Amendment to Method of Participant Recruitment Approval

---

From: psychethics
Sent: 08 January 2018 13:15
To: Matthew Yates; Victoria Samuel
Subject: Ethics Feedback - EC.17.09.12.4942RA

Dear Matthew,

The Ethics Committee has considered the amendment to your PG project proposal: Mediators of Burnout and Post Traumatic Stress Disorder (EC.17.09.12.4942RA).

The amendment has been approved.

Please note that if any changes are made to the above project then you must notify the Ethics Committee.

Best wishes,
Mark Jones

School of Psychology Research Ethics Committee

Cardiff University	Prifysgol Caerdydd
Tower Building	Adeilad y Tŵr
70 Park Place	70 Plas y Parc
Cardiff	Caerdydd
CF10 3AT	CF10 3AT
Tel: +44(0)29 208 70360	Ffôn: +44(0)29 208 70360
Email: psychethics@cardiff.ac.uk	E-bost: psychethics@caerdydd.ac.uk
http://psych.cf.ac.uk/aboutus/ethics.html	

HRA Wales Approval

Dear Mr. Yates,

Re: Mediators of Burnout and Post Traumatic Stress Disorder (IRAS 223223) – Study-wide Governance Checks Complete for Wales

I am pleased to confirm that all the study-wide (global) governance checks for Wales have been completed for your study, however this does not constitute permission to proceed at research sites. When local governance checks are satisfied for a participating research site, the NHS organisation R&D office will issue a letter to confirm NHS research permission for that site.

The study-wide governance review was satisfied using the Research Protocol v4.9, dated 11 Jul 2017. Please find attached a list of study-wide documents that have been approved.

The governance report will now be forwarded to the HRA in England.

The study is currently under review for NHS permission at Cardiff & Vale UHB.

Please ensure any further SSI forms for sites in Wales are submitted to research-permissions@wales.nhs.uk. The following documentation is required:
- SSI Form PDF version
- SSI Form XML file
- SSI checklist (and all documents listed on the checklist)

Please note that you cannot commence the study at a particular site until you have received written confirmation of NHS Research Permission for that site.

All amendments made during your study, after NHS research permission has been gained, should be notified to research-permissions@wales.nhs.uk .
Please see https://www.myresearchproject.org.uk/help/hlpamendmentsresearch.aspx#Submitting-your-amendment for further information.

Please contact research-permissions@wales.nhs.uk should you require any further information or assistance.

Kind regards,

Direct line: 02920 785724

_____

Iain W. Reid

NHS

Health Research Authority

Mr Matthew Yates

Email: hra.approval@nhs.net

06 October 2017

Dear Mr Yates

Letter of HRA Approval

Study title:	**Mediators of Burnout and Post Traumatic Stress Disorder: A Multi-Site Study of Oncology Professionals Working with Children and Young People**
IRAS project ID:	223223
Protocol number:	SPON 1588-17
REC reference:	18/HRA/0287
Sponsor	**Cardiff University**

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from www.hra.nhs.uk/hra-approval.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

After HRA Approval

The attached document *"After HRA Approval – guidance for sponsors and investigators"* gives detailed guidance on reporting expectations for studies with HRA Approval, including:

- Working with organisations hosting the research
- Registration of Research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics and is updated in the light of changes in reporting expectations or procedures.

Scope

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found at http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/.

HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

Your IRAS project ID is **223223**. Please quote this on all correspondence.

Yours sincerely

Catherine Adams
Senior Assessor
Email: hra.approval@nhs.net

Copy to: *Mrs Helen Falconer, Sponsor Representative*
                Mrs Jane Jones, Cardiff And Vale University Health Board

100

HRA Wales Amendment
to Method of Participant Recruitment Approval

Dear Matthew,

Thank you for submitting an amendment to your project.

If you have participating NHS/HSC organisations in any other UK nations that are affected by this amendment we will forward the information to the relevant national coordinating function(s).

Please note that you may only implement changes described in the amendment notice.

What Happens Next?

When available, please forward any other regulatory approvals for this amendment to research-permissions@wales.nhs.uk

Information Specific to Participating NHS/HSC Organisations in Northern Ireland, Scotland and/or Wales

1. You may implement this amendment **as soon as any relevant regulatory approvals are in place.**

2. You do not need to inform the R&D offices, as we have separately made it available via their national coordinating functions.

3. Participating NHS/HSC organisations should prepare to implement this amendment, where expected.

Information Specific to Participating NHS Organisations in England

1. An assessment against HRA standards will take place.

2. Once the HRA assessment has been successfully completed, you will receive an email confirming that your amendment has HRA Approval.

3. You may implement this amendment **as soon as HRA Approval for the amendment is issued.**

4. You should ensure that participating NHS organisations in England are informed of this amendment. In doing so, you should include the NHS R&D Office, LCRN (where applicable) as well as the local research team.

5. Participating NHS organisations in England should prepare to implement this amendment, where expected.

IRAS Project ID:	223223
Short Study Title:	Mediators of Burnout and Post Traumatic Stress Disorder
Date complete amendment submission received:	15 Jan 2018
Sponsor Amendment Reference Number:	Protocol V5
Sponsor Amendment Date:	09 Jan 2018
Amendment Type	Non-Substantial
Outcome of HRA Assessment	**HRA Approval for the amendment is pending** – the HRA will separately confirm HRA approval for the amendment by e mail.
For NHS/HSC R&D Office information	
Amendment Category	C

If you have any questions relating to this amendment in one of the devolved administrations, please direct these to the relevant national coordinating function.

If you have any questions relating to the wider HRA approval process, please direct these to hra.approval@nhs.net.

Additional information on the management of amendments can be found in the IRAS guidance.

Please do not hesitate to contact me if you require further information.

Kind regards

Anne

Research Permissions Service – Amendments Team
Email: Research-permissions@wales.nhs.uk

HRA England Amendment
to Method of Participant Recruitment Approval

IRAS 223223. HRA Approval for the Amendment

PM PATE, Michael (HEALTH RESEARCH AUTHORITY) <michael.pate@nhs.net>   👍   ↩ Reply all | ∨
     Mon 05/02/2018 10:15
     To: Matthew Yates; John Lowe
     Cc: AMENDMENTS, Hra (HEALTH RESEARCH AUTHORITY) <hra.amendments@nhs.net> ≫

Inbox

You forwarded this message on 23/03/2018 09:56

📄 image002.emz   ∨
    1 KB

≫ Show all 1 attachments (1 KB)   Download   Save to OneDrive - Cardiff University

Dear Matthew

Further to the below, I am pleased to confirm **HRA Approval** for the referenced amendment.

You should implement this amendment at NHS organisations in England, in line with the conditions outlined in your categorisation email.

Please contact hra.amendments@nhs.net for any queries relating to the assessment of this amendment.

Kind regards

Michael Pate

Assessor

Michael Pate
Assessor

Health Research Authority

3rd Floor – Barlow House | 4 Minshull Street | MANCHESTER | M1 3DZ
T. 0207 104 8197
E. michael.pate@nhs.net
W. www.hra.nhs.uk

Psycho-Oncology Journal Submission Guidelines

1. SUBMISSION

Thank you for your interest in *Psycho-Oncology*. Note that submission implies that the content has not been published or submitted for publication elsewhere except as a brief abstract in the proceedings of a scientific meeting or symposium.

Once you have prepared your submission in accordance with the Guidelines, manuscripts should be submitted online at https://mc.manuscriptcentral.com/pon

The submission system will prompt you to use an ORCiD (a unique author identifier) to help distinguish your work from that of other researchers. Click here to find out more.

Click here for more details on how to use ScholarOne.

For help with submissions, please contact Psycho-Oncology@wiley.com

We look forward to your submission.

2. AIMS AND SCOPE

Psycho-Oncology is concerned with the psychological, social, behavioral, and ethical aspects of cancer. This sub-speciality addresses the two major psychological dimensions of cancer: the psychological responses of patients to cancer at all stages of the disease, and that of their families and caretakers; and the psychological, behavioral and social factors that may influence the disease process. Psycho-oncology is an area of multi-disciplinary interest and has boundaries with the major specialities in oncology: the clinical disciplines (surgery, medicine, pediatrics, radiotherapy), epidemiology, immunology, endocrinology, biology, pathology, bioethics, palliative care, rehabilitation medicine, clinical trials research and decision making, as well as psychiatry and psychology.

This international journal is published twelve times a year and will consider contributions to research of clinical and theoretical interest. Topics covered are wide-ranging and relate to the psychosocial aspects of cancer and AIDS-related tumors, including: epidemiology, quality of life, palliative and supportive care, psychiatry, psychology, sociology, social work, nursing and educational issues.

Special reviews are offered from time to time. Summary proceedings of important national and international symposia falling within the aims of the journal are presented.

Manuscripts should be confined to work relating to cancer and AIDS-related tumors. The criteria for publication are originality, high scholarly quality as determined by peer review, interest to a wide audience of those concerned with psycho-oncology.

3. MANUSCRIPT CATEGORIES AND REQUIREMENTS

Psycho-Oncology publishes a number of different article types including:

• **Original Paper**
Original research papers should contain reports of new research findings that make a significant contribution to knowledge. Original papers should not exceed 4,000 words.

• **Reviews**
Reviews should be critical reviews of the literature, including systematic reviews and meta-analyses and should not exceed 6,000 words, excluding references. Please complete and upload a PRISMA or AMSTAR checklist for systematic reviews.

• **Invited Editorials and Commentaries**
Please approach the Editorial Office (Psycho-Oncology@wiley.com) for details.

• **Clinical Correspondence**
This includes brief commentaries, letters to the editor, feasibility studies, clinical updates, case reports and brief research reports. They must include five succinct key points (and no abstract), not exceed 1,500 words in total (including no more than two figures/tables). References should be limited to ten and are not included in the word count.

• **Obituaries**

• **Registered Reports**
Psycho-Oncology is offering authors a new article type designed to increase the transparency and reproducibility of hypothesis-driven science, the Registered Report. Registered Reports differ from

conventional research article as part of the review process is conducted *before* authors collect and analyse data. The cornerstone of the Registered Reports format is that a significant part of the manuscript will be assessed prior to data collection, with the highest quality submissions accepted in advance. Please view the full Registered Reports author guidelines here to help prepare your submission.

Qualitative manuscript submissions should usually be based on a minimum of 20 respondents. Authors may contact the Editor (maggie.watson@live.co.uk) if they require further details.

For cross sectional studies, we require authors to adhere to the STROBE reporting standards for observational research. Please upload your STROBE checklist alongside your submission.

4. PREPARING YOUR SUBMISSION

Manuscripts must be submitted as a Word or rtf file and should be written in English. The manuscript should be submitted in separate files: main text file; figures.

Text file

The text file should be presented in the following order:

(i) Title; (ii) a short running title of less than 70 characters; (iii) the full names of the authors; (iv) the author's institutional affiliations at which the work was carried out, (footnote for author's present address if different to where the work was carried out); (v) abstract; (vi) main text, (vii) acknowledgements, (viii) conflict of interest statement, (ix) references, (x) tables (each table complete with title and footnotes) (xi) figure legends, (xii) appendices (if relevant). Figures and supporting information should be supplied as separate files.

Title

The title should be a short informative title that contains the major key words. The title should not contain abbreviations (see Wiley's best practice SEO tips)

Authorship

Please refer to the journal's authorship policy the Editorial Policies and Ethical Considerations section for details on eligibility for author listing.

Acknowledgements

Contributions from anyone who does not meet the criteria for authorship should be listed, with permission from the contributor, in an Acknowledgments section. Financial and material support should also be mentioned. Thanks to anonymous reviewers are not appropriate.

Conflict of Interest Statement

You will be asked to disclose conflicts of interest during the submission process. See the section 'Conflict of Interest' in the Editorial Policies and Ethical Considerations section for details on what to include in this section. Please ensure that you liaise with all co-authors to confirm agreement with the final statement. The Conflict of Interest statement should be included within the main text file of your submission.

Abstract

Please provide an abstract of no more than 250 words.

Keywords

Please provide up to 10 keywords and list them in alphabetical order. Please ensure that the keywords, cancer and oncology, are used for indexing purposes. Keywords should be taken from those recommended by the US National Library of Medicine's Medical Subject Headings (MeSH) browser list at https://www.nlm.nih.gov/mesh/.

Main text

Where possible, the text should be divided into the following sections: Background, Methods (including statistical methods), Results and Conclusions. All papers must include within the Conclusions section a paragraph explaining the study limitations (with subtitle "study limitations") and a paragraph explaining the clinical implications of the study (with subtitle "clinical implications").

A statement explicitly describing the ethical background to this study and any institutional or national ethical committee approval (including approval number) must be included within the manuscript.

For clinical trial reports, the clinical trial registration number must be included within the manuscript.

References

Submissions are not required to reflect the precise reference formatting of the journal (use of italics, bold etc.), however it is important that all key elements of each reference are included. Please see below for examples of reference content requirements.

For more information, please see the Vancouver Reference Style Guide

Sample references follow:

Journal Article

1. Wood WG, Eckert GP, Igbavboa U, Muller WE. Statins and neuroprotection: a prescription to move the field forward. Ann N Y Acad Sci 2010; 1199:69-76.

Book

2. Hoppert, M. Microscopic techniques in biotechnology. Weinheim: Wiley-VCH; 2003.

Electronic Material

3. Cancer-Pain.org [homepage on the internet]. New York: Association of Cancer Online Resources, Inc.; c2000–01 [Cited 2015 May 11]. Available from: http://www.cancer-pain.org/.

Tables

Tables should be self-contained and complement, but not duplicate, information contained in the text. They should be supplied as editable files, not pasted as images. Legends should be concise but comprehensive – the table, legend and footnotes must be understandable without reference to the text. All abbreviations must be defined in footnotes. Footnote symbols: †, ‡, §, ¶, should be used (in that order) and *, **, *** should be reserved for P-values. Statistical measures such as SD or SEM should be identified in the headings.

Figure Legends

Legends should be concise but comprehensive – the figure and its legend must be understandable without reference to the text. Include definitions of any symbols used and define/explain all abbreviations and units of measurement.

Preparing Figures

Although we encourage authors to send us the highest-quality figures possible, for peer-review purposes we are happy to accept a wide variety of formats, sizes, and resolutions.

Click here for the basic figure requirements for figures submitted with manuscripts for initial peer review, as well as the more detailed post-acceptance figure requirements.

Guidelines for Cover Submissions

If you would like to send suggestions for artwork related to your manuscript to be considered to appear on the cover of the journal, please follow these general guidelines.

Appendices

Appendices will be published after the references. For submission they should be supplied as separate files but referred to in the text. Supporting Information

Supporting Information

Supporting information is information that is not essential to the article but that provides greater depth and background. It is hosted online, and appears without editing or typesetting. It may include tables, figures, videos, datasets, etc. Click here for Wiley's FAQs on supporting information.

Note, if data, scripts or other artefacts used to generate the analyses presented in the paper are available via a publicly available data repository, authors should include a reference to the location of the material within their paper.

General Style Points

The following links provide general advice on formatting and style.

• Abbreviations: In general, terms should not be abbreviated unless they are used repeatedly and the abbreviation is helpful to the reader. Initially use the word in full, followed by the abbreviation in parentheses. Thereafter use the abbreviation only.
• Units of measurement: Measurements should be given in SI or SI-derived units. Visit the Bureau International des Poids et Mesures (BIPM) website at http://www.bipm.fr for more information about SI units.
• Trade Names: Chemical substances should be referred to by the generic name only. Trade names should not be used. Drugs should be referred to by their generic names. If proprietary drugs have been

used in the study, refer to these by their generic name, mentioning the proprietary name, and the name and location of the manufacturer, in parentheses.

Wiley Author Resources

Wiley has a range of resources for authors preparing manuscripts for submission available here. In particular, authors may benefit from referring to Wiley's best practice tips on Writing for Search Engine Optimization.

Editing, Translation and Formatting Support: Wiley Editing Services can greatly improve the chances of your manuscript being accepted. Offering expert help in English language editing, translation, manuscript formatting and figure preparation, Wiley Editing Services ensures that your manuscript is ready for submission.

Reflections on a Large Scale Research Project

Introduction

This essay summarises learning and reflections on the process of carrying out a Large-Scale Research Project (LSRP) and further exploration of the ideas that were presented. The motives behind the direction of the systematic literature review and empirical paper are shared. Discussion of the methodology, challenges, and learning are presented. Issues surrounding burnout and the Maslach Burnout Inventory (MBI) measure are discussed. Importantly, implications for the findings of the LSRP are discussed in light of Welsh government and NHS policy. This is followed by considering the implications for practicing clinicians and wider NHS services. Suggestions for the direction of future research are explored. Finally, the present and future plans for dissemination are shared.

Paper 1: Systematic Literature Review

Contributing Factors to Paper Development

I chose to carry out a systematic literature review on burnout in oncology physicians for two principal reasons. Firstly, a number of reviews concerning oncology nurses have previously been conducted, including two recent oncology nurse specific reviews (Cañadas-De la Fuente et al., 2018; Gomez-Urquiza et al., 2016). Secondly, an initial database search of studies exploring burnout in paediatric oncology staff in general found few results. Indeed, Mukherjee and colleagues (2009) review of burnout in this population found research concerning the group was extremely limited. The researchers found only one study concerning paediatric oncology physicians, with the majority focusing solely on paediatric oncology nurses. Of these, data were qualitative, or from studies with small numbers of participants. At the time of their review, Mukherjee and colleagues found no studies which assessed burnout in this population using the Maslach Burnout Inventory (Maslach et al., 2017), considered the gold standard for burnout measurement (Schaufeli & Taris, 2005). Therefore, I focused my review on both adult and paediatric oncology physicians, though ultimately, only two studies with paediatric data were included.

Methods, Challenges, & Learning

Search Process

The inclusion/exclusion criteria used in the database search appears to have accurately identified the majority of the relevant literature. The database search itself was overseen by a librarian with specialist skills in searching databases for psychology literature. A weakness of the search process is that I lacked the resources to include papers in languages other than English. Therefore, a number of papers were excluded from the review, which may have resulted in valuable information being missed or bias in the papers that were included.

Critical Appraisal Tool

It is important to assess the methodological quality of papers when conducting a systematic literature review. This should be carried out using a validated quality tool. I conducted a thorough search of possible tools which could be used to assess the papers. Upon reviewing what was available, it became apparent that large numbers of appraisal tools were too generic in application. It was clear that I need a tool which was well suited to studies assessing prevalence rates. I eventually settled on The Joanna Briggs Institute Critical Appraisal tools for use in JBI Systematic Reviews: Checklist for Prevalence Studies (Munn et al., 2015). The tool is validated for assessing the methodological quality of studies presenting prevalence data in systematic reviews (Munn et al., 2014). To reduce the chance of bias, 22% of studies were rated by someone independent to the research. I found the process very informative. It was interesting to observe a small degree of variation between my own and the second rater's interpretations of the information, which showed the value in discussing the rationale behind the interpretations. Fortunately, the independent rater and I had an average high strength of agreement.

Meta-analysis

A strength of the systematic literature review was the application of meta-analysis to compile pooled prevalence rates of burnout in oncology physicians. Consolidating the burnout measurement scores in a meta-analysis increases statistical power and provide increased effect size accuracy (Noordzij, Hooft, Dekker, Zoccali, & Jager, 2009). This was a new experience for me and one which presented substantial technical difficulty. Initially, I attempted to make use of the free software provide by Cochrane Community, RevMan5 (The Cochrane Collaboration, 2014), however, I struggled to input the paper data in a manner which the software could interpret. After exploring alternative options, I found success with an add-on extension for Microsoft Excel, MetaXL (Barendregt & Doi, 2016).

Similar Review Discovery

At the point of commencing the systematic literature review, I was unaware of any reviews concerning burnout in oncology physicians. It was frustrating then to discover that in the last few months before the LSRP hand-in date that Medisauskaite & Kamau (2017) published a review regarding this population. At first, I was concerned that this had implications for my own work and raised anxiety that I might have to redo my own review. However, I remained focused, and upon critical examination of Medisauskaite & Kamau's (2017) work, clear differences appeared. Their review was limited to the examination of only one subscale of the MBI (EE) and lacked the breadth of coverage of studies my own review found, in particular, the examination of associated factors. As such, my systematic review provides a much-needed paper compiling the research to-date and offers a more nuanced comment on oncologist burnout and associated factors.

Paper 2: Empirical Study

Contributing Factors to Paper Development

Initially, my research supervisor and I had planned for the empirical study to focus on the evaluation of an ACT group for parents of children with chronic conditions such as long-term health conditions, developmental delay or autistic spectrum conditions. However, the facilitators of the ACT group went on to choose to evaluate the outcomes of the group themselves. While disappointing, this prompted us to go in a new direction. In hindsight, this was fortunate. It led to a project which could be crafted from the ground up and allowed full ownership of the direction of the research. In recent years, I have been increasingly drawn toward ACT principles both personally and professionally. It was important to me to that the concepts of ACT remained a key part of my line of research.

My first job after completing my undergraduate degree was as a Support Worker in an eating disorders inpatient unit. The care provision felt very much driven by a health/medical model approach. Subsequently, I had a similar sense within a secure rehab and recovery ward on my first placement as a trainee clinical psychologist. In both instances, I was struck by my acceptance of thoughts and emotions being at odds with the experience of a number of my colleagues. Upon reflection, I wondered if staff in medical settings have been socialised to avoid emotion. My research supervisor had had similar reflections on her own time working in medical hospitals as a psychologist, particularly concerning paediatric health settings. As we discussed this further, our conversations kept coming back to our observations of staff burnout. We hypothesised that a key factor associated with burnout and poor coping might be that staff (understandably) try to block out unpleasant thoughts of feelings brought up by the work. Furthermore, we wondered if this is perpetuated by a culture within health/medical fields of avoiding the expression of emotion. This coincided with learning of a Spanish research study which found a relationship between burnout and the ACT concept of experiential avoidance in nurses (Iglesias et al., 2010). In addition, my supervisor shared recent research studies examining burnout and post-traumatic stress in medical staff lead by Dr. Gillian Colville (Colville et al., 2015; Colville, Smith, Brierley, Citron, Nguru, Shaunak, Tam, & Perkins-porras, 2017; Colville & Smith, 2017). It was striking that the coping strategies that staff felt were most helpful, in reality, actually correlated with poorer psychological well-being. My supervisor and I discussed how staff in Dr. Colville's studies who, e.g., exercise excessively to try to cope with workplace distress, may be doing so to avoid thinking about the distress. With regard to the underlying processes of ACT, it is hypothesised that this experiential avoidance leads to greater suffering. Our line of thought also fitted with increased recognition from health organisations of the importance of allowing emotion, for example, the growing existence of

Schwartz Rounds. This led to us crafting a new proposal to assess burnout and post-traumatic stress in paediatric oncology staff and its relationship with the ACT constructs of psychological flexibility and experiential avoidance.

Both my own and my supervisor's experiences of witnessing burnout highlighted our sense that it has a negative impact on service provision. Indeed, employers are becoming increasingly aware of the implications of mental health difficulties in the workplace. In 2016/17 in the UK, there were an estimated half a million new or long-standing cases of work-related stress, depression or anxiety (Health and Safety Executive, 2017). This psychological distress resulted in approximately 12.5 million (49%) of all working days lost due to absences in the same period (Health and Safety Executive, 2017). Unsurprisingly, there is a growing acknowledgment of the impact of psychological distress within working populations. Clinicians and researchers have therefore endeavoured to construct efficacious interventions. Evidence suggests that implementing ACT based interventions in healthcare workplaces reduces depression and anxiety in workers, as well as burnout (Iglesias et al., 2010). Waters et al., (2018) found 50% of healthcare workers attending a one-day workplace ACT intervention group exhibited a significantly lower level of psychological distress three months post-intervention when compared to a control group. When provided with the same intervention, a large proportion of the control group members (69%) also went on to show a clinically significant reduction in psychological distress. Combined, the literature highlighted that researching these concepts could have significant implications for oncology staff. It felt particularly pertinent given that the plethora of burnout research in healthcare staff to-date had largely missed paediatric oncology.

Methods, Challenges, & Learning

Health Research Authority Approval

I found the completion of the LSRP a considerable challenge. While many aspects of the work were planned out in advance and adequately prepared for, a number of factors impeded progress. A significant amount of time was lost during the NHS Health Research Authority (HRA) approval process. This resulted in a tremendous amount of stress. The lack of transparent process and separation of HRA England and HRA Wales was challenging and resulted in regular phone calls and emails.

Questionnaire Creation

I created the online questionnaire using Qualtrics® (a secure online survey platform). After starting the creation of the questionnaire, it soon became apparent that a high level of attention and detail was needed. I spent a considerable amount of time designing the questionnaire to make it a user-

friendly experience. For example, designing the format to work on a computer screen as well as a smartphone and making sure the survey provided clear instructions. At the same time, I was able to use Qualtric's advanced technological ability to limit factors which might negatively impact the data collection. For example, participants were not able to skip questions, internet IP addresses were masked to protect anonymity, only certain information was presented based on participant input, and creating a link to an external database for entry into the prize draw, which could not be linked to participant data. I tested the questionnaire for usability and accuracy with oncology staff that were unable to participate in the study (those with less than one year's experience). I was delighted with the final product and gained insight into the importance of meticulous questionnaire design.

Participant Recruitment

Through links with local oncology clinicians and others known to my research supervisor, five research sites with paediatric oncology hospital units were sought as populations from which to find participants. Support from the sites quickly led to individuals who were willing to act as principal investigators. Initially, due to the number of oncology staff working at each research site, the principal investigators were confident the study would obtain over one hundred participants. However, recruitment of participants was challenging. It became apparent that the original method of recruitment was ineffective. This involved principal investigators providing potential participants with information sheets about the study, which invited them to write down their email address to be sent a link to the study. This relied on principal investigators, who were already employed in demanding, time-consuming jobs, making contact with the appropriate staff. It also created a delay between recording email addresses and these being sent to me securely.

I visited the five research sites throughout the LSRP process. Initially, this entailed meeting potential principal investigators, discussing the plans for the research project, and visiting the oncology wards. After recruiting the principal investigators, I visited the sites and attended ward handovers to help promote the study and obtain participants. Conveniently, one of my clinical placements was at one of the research sites. This proved to be very useful for strengthening relationships with staff and being known to the wider team. This led to staff offering their services to trial the questionnaire before it was finalised. Their comments helped tailor the questionnaire accordingly.

Prior to visiting each research site, I would always have my attendance approved the ward manager. However, it was interesting to note the variability of welcome from the nurses in charge of each shift. Largely, I was made to feel very welcome and encouraged to use my visits as a chance to access staff. This then made it notable that one or two charge nurses appeared reluctant to have me join handovers. Throughout these visits, it was frustrating to find that at times, face-to-face willingness

to participate didn't always translate to subsequent questionnaire completion, particularly when the site was a long distance from my home. Recruitment remained a challenge. Anecdotally, the staff at one of the research sites explained that their team had just experienced a testing six months, with an unusually high number of patient deaths. The staff felt that this may have contributed to a lack of motivation to participate in the study.

Due to the difficulties in recruitment, a study amendment was sought from the University Psychology Ethics Panel and the Health Research Authority (HRA). The amendment requested permission to directly contact entire oncology staff groups at the five research sites and national oncology profession groups via email. The amendment also requested approval to offer potential participants the chance to win a £100 voucher. Waiting for the amendment to be approved created a further delay in participant recruitment. Once in place, however, these strategies vastly improved recruitment. In hindsight, these methods should have been used from the beginning. However, despite these amendments, physician recruitment remained low. Anecdotally, three physicians felt that the low levels of recruitment were the result of burnout itself, as opposed to a lack of interest. To help combat this, further national paediatric oncology physician-specific groups were contacted to publicise the study, which successfully increased physician recruitment. The ever-present concern about participant numbers was stressful. However, the persistence paid off, and I felt a real sense of achievement at ultimately collecting a decent sample of participants.

Shortened Measures

Deciding which psychometric measures to use required a significant amount of consideration. It was essential to obtain a comprehensive volume of data, which adequately covered the key psychological aspects being researched. However, it was a challenge to balance breadth of information with brevity of questionnaire length. This was pertinent given the population are busy NHS professionals working in high-pressure environments with demanding working hours. As such, I utilised shortened forms of measures where possible. The Brief COPE (Carver, 1997) was chosen over the full COPE (Carver, Scheier, & Weintraub, 1989) to reduce the number of questionnaire items. The lead author of both versions of the measure has described experiencing a number of situations in which the full COPE was too long for participants (Carver, 1997). Carver thus created the Brief COPE, which was guided by earlier factor analysis of the full COPE and utilised items with strong loading. An advantage of the Brief COPE is that it is designed to be flexible, with researchers instructed to use the subscales selectively based on their needs (Carver, 1997). This enabled the number of Brief COPE items to be reduced to eight, covering coping styles of self-distraction; active coping; substance use; and use of emotional support. Similarly, the abbreviated Maslach Burnout Inventory (aMBI; McManus, Keeling, & Paice, 2004) was used in place of the full MBI (Maslach et al., 1996, 2017). The abbreviated version has been utilised globally to measure burnout in thousands of

healthcare professionals (e.g., Langade et al., 2016; McManus, Keeling, & Paice, 2004; Zuraida & Zainal, 2015). Factor analysis has shown that the abbreviated form retains the same factor structure as the full MBI (McManus, Winder, & Gordon, 2018). Combined, these shortened versions of measures were a valuable resource. The CompACT (Francis et al., 2016) was a useful combined measure of psychological flexibility tool, which while providing an overall 'psychological flexibility' score, also providing three subscales which provide good coverage of the key concepts in ACT.

Expert Advice

Researchers and clinicians with expertise in paediatric oncology, burnout research, PTSD research, or ACT were contacted throughout the LSRP. For example, Dr. Gillian Colville was consulted regarding her research exploring burnout and PTSD in healthcare staff (e.g., Colville et al., 2015; Colville et al., 2017; Colville & Smith, 2017), and her use of the abbreviated form of the MBI (aMBI). This included guidance on accurately replicating the method of pro-rating aMBI scores for comparison with full MBI scores (Colville et al., 2017; personal communication, 20th January, 2018).

In view of wanting to measure psychological flexibility accurately, Professor Frank Bond, a leading figure in ACT and the measurement of ACT constructs was also contacted to seek his guidance about the appropriateness of the various measures available. This was mainly concerning the suitability of the AAQ-II (Bond et al., 2011) over the Work-related Acceptance and Action Questionnaire (WAAQ) (Bond, Lloyd, & Guenole, 2013). The WAAQ explores the work-specific nature of psychological flexibility and is designed to assist in populations where participants may find it strange to be asked about their mental health. However, as the empirical study explored burnout and PTSD rather than measures of work-related behavioural effectiveness, and examined healthcare professionals, Professor Bond recommended using the AAQ-II (F. Bond, personal communication, 7th June, 2017).

Before completing the LSRP, I was under the illusion that "big names" in the psychology and wider research world be reluctant to reply to communication. I assumed that they would be inundated with requests and the demands of their work. I was then pleasantly surprised to receive replies, and in some circumstances maintain an on-going dialogue, with the majority of clinicians and researchers I contacted. The experience challenged my preconceptions and will encourage me to reach out to other researchers (regardless of their status) in future work.

While I owe a massive debt of gratitude to all the principal investigators at each research site, one particularly stood out. They provided a tremendous amount of support, in particular, valuable guidance of the workings of paediatric oncology teams and avenues for recruitment. Despite carrying out a highly demanding role themselves, they were always quick to respond to emails and phone calls and gained me access to clinicians I would not have been able to contact otherwise. It

was a lovely experience to find someone so helpful and willing to give their time and support to the project. They played an essential part in the success of the empirical study.

Debate Surrounding Burnout and the Maslach Burnout Inventory Measure

Originally curated and developed during the 1970s, the synthesis of the first version of the MBI measure was released in 1981 (Maslach & Jackson, 1981). Ever since this time, clinicians and researchers have debated the conceptualisation of "burnout." Some argued that rather than a newly identified construct, burnout was merely repackaging of depression. However, evidence went on to support the notion that while burnout and depression interact and overlap with one another, they are separate phenomena (Leiter & Durup, 1994; Schaufeli, Bakker, Hoogduin, Schaap, & Kladler, 2001). Others debated whether burnout was a single entity (Jones, 1980) or a multidimensional construct, e.g., the MBI's emotional exhaustion, depersonalisation, and low personal accomplishment subcomponents. Maslach and colleagues argue that the qualitative and quantitate research on which the MBI foundation was built, along with the subsequent research pertaining to burnout and the MBI have now qualified the multidimensional theory (Maslach, Leiter, & Schaufeli, 2008). As discussed in my LSRP papers, the MBI has fluctuated from initially scoring burnout on a continuous scale, to later revisions providing cut-off scores for absent, low, average, and high levels of burnout (Maslach et al., 1996). While intended to satisfy a desire to categorise and measure burnout in more detail, as a consequence it has resulted in researchers presenting burnout data in a variety of methods, e.g., mean scores, burnout/no burnout, or low, medium, high categorisation. Primarily, researchers lean toward measuring burnout on a continuum, while healthcare professionals prefer burnout or no burnout criterion (Maslach et al., 2008). Furthermore, the cut-offs are based on North American normative samples (Bianchi, Schonfeld, & Laurent, 2017). While normative data has now been expanded to multiple countries and cultures, researchers often base their cut-offs on the original sample (Bianchi, Schonfeld, & Laurent, 2017) regardless of the study's country of origin. I found it interesting to explore how a measure could evolve and morph over the years. This has been, in part, due to a desire to meet demands of researchers and clinicians, but I also suspect a consequence of the creators of the MBI looking to profit from the continued licensing of the measure.

In addition to the design of the MBI measure, consideration must be given to the question of whether burnout is a universal phenomenon or unique to Western culture. Indeed, burnout research stemmed from Western, mostly US-based research. The years immediately preceding Maslach and colleagues' burnout research (the 1960s) were a period in which growing numbers of people were inspired to pursue jobs in the helping professions such as social work and medicine (Schaufeli, Leiter, & Maslach, 2008). These individuals were faced with a growing realisation of inequality in the society. Many were driven to reduce the suffering and the impact of poverty (Schaufeli, Leiter, & Maslach, 2008). Yet, after a decade of work, poverty and disadvantage remained.

This possibly resulted in a group of once idealistic individuals being faced with the harsh reality of deep-rooted problems, which no matter how hard they tried, maintained vast swathes of society heavily impacted by poverty (Schaufeli et al., 2008). Maslach and colleagues have argued that this frustration, lack of fulfilment, and ultimately diminished compassion were the critical factors of burnout and what prompted the original burnout research (Schaufeli et al., 2008). People in helping professions moved into larger, state-managed and funded services. The increased bureaucracy and control left many workers exacerbated. Their deep personal altruistic values clashed against the "procedures" and organisationally lead priorities. Accordingly, it could be argued that burnout is a Western problem. Indeed, at this time of initial burnout research, countries such as India and those on the African subcontinent appeared not to be faced with the problem of burnout. However, research in the 2000s onwards indicated burnout was experienced in Africa, China, and India (Schaufeli et al., 2008). It appears an interesting coincidence that at this time privatisation, globalisation and denationalisation of services grew in these areas (Kulkarni, 2006). It is therefore suggested that modernisation and rapid development has given rise to burnout (Schaufeli et al., 2008). Indeed, burnout has now been researched and found globally.

Given that an estimated 90% of studies across the world have used the MBI to measure burnout (Schaufeli & Enzmann, 1998), it was prudent to focus the review on studies using this measure. Doing so also facilitated more straightforward comparison of burnout data. However, other relevant research exploring factors associated with burnout using alternative measures may not have been identified, for example, research using The Copenhagen Burnout Inventory (Kristensen, Borritz, Villadsen, & Christensen, 2005) or the Oldenburg Burnout Inventory (Demerouti, Demerouti, Bakker, Vardakou, & Kantas, 2003).

How the LSRP Could Inform Practice

Relationship to Research Governance, Policies, and Services

NHS Wales states that the psychological health and well-being of staff is the responsibility of all members of the organisation (NHS Wales Shared Partnership Services, n.d.) and that it must respond to the Review of the Health and Well-being of NHS Staff document (Boorman, 2009). This review highlighted clear associations between the well-being of NHS staff and patient safety, patient experience, and the effectiveness of patient care (Boorman, 2009). The report makes some recommendations, including systemically embedding staff health and well-being into the design of the NHS (Boorman, 2009). Furthermore, the Welsh Government report "Together For Health – A Five Year Vision for the NHS in Wales" (Welsh Government, 2011) states that staff who are physically and mentally healthy improves the quality of services, increases productivity, and reduce absences due to sickness. Also, it writes that the NHS must be seen as an example to all of a service that ensures the well-being of its staff (Welsh Government, 2011). Similarly, NHS England has produced a Commissioning for Quality and Innovation (CQUIN) framework, which supports improvements in the quality of NHS services. Indicator 1 focuses on improving the health and wellbeing of NHS staff. The framework describes four main reasons for focusing on staff health and wellbeing: improved patient safety, improved staff retention, reduced costs, and setting an example for other industries to follow (NHS England, 2017).

In addition to the moral argument to improve staff well-being, there are patient-related drivers; burnout erodes patient care, increases medical errors and costs the NHS billions of pounds due to these errors and the resulting lawsuits (Department of Health, 2000; Hall et al., 2016). It also increases staff absence due to sickness (Anagnostopoulos & Niakas, 2010), and leads to oncologists prematurely leaving the professional (Blanchard et al., 2010b). A report by the Royal College of Physicians (2015) argues that despite these data, NHS policies, two decades of research, and intuitions calling for change, NHS trusts, health boards, and commissioners have failed to make significant changes. They stress that the NHS must take mental wellbeing seriously to prevent burnout and that early intervention and personalised support must be available for staff. Burnout in relation to oncology is a cause for concern; there is already a significant shortage of oncology staff and an increasing number of vacant positions (The Royal College of Radiologists, 2017). The findings of my systematic literature review and empirical paper suggest that a number of oncology staff experience poor well-being in the shape of burnout. It is therefore clear that NHS services require interventions to reduce burnout.

Encouragingly, medical institutions are now starting to take steps to better support staff. This includes new American Medical Association policies giving confidential access to mental health support (AMA, 2016), and NHS England providing £5million to improve the well-being of staff,

including access to talking therapies (NHS England, 2015). NHS Employers have developed an emotional well-being toolkit for staff to encourage understanding about emotional well-being and describe how work overload, inadequate equipment and resources, difficult home-work balance, and work-related aggression and violence can lead to health and stress-related symptoms such as burnout (NHS Employers, 2018).

Engagement in support services can be challenging, however. As in other professions, there is a stigma attached to healthcare professions admitting to experiencing mental health difficulties, which in turn creates barriers to accessing support (Bismark, Morris, & Clarke, 2014; Knaak, Mantler, & Szeto, 2017). This stigma extends to admitting to experiencing burnout. Sadly, many existing policies can further perpetuate this. In the UK, physicians are advised to report if a colleague displays "mental ill health" (General Medical Council, 2014). While such policies are in place to protect patients, it propagates a culture of keeping distress to yourself, as opposed to seeking support.

Historically, many "doctors strive for detachment to reliably care for all patients regardless of their personal feelings" (Halpern, 2003 p.671). This 'detached concern,' (Fox, 2006) was taught to physicians as a way of creating separation from patients in an effort to protect themselves from negative emotions. It was felt that this enabled physicians to supposedly listen *empathically,* but avoid the associated emotion (Halpern, 2003). However, this is at odds with the very definition of empathy. Anecdotally, there appears to be an underlying culture within UK medical fields that perpetuates this non-display of emotion. For example, in an online Guardian article, a UK paediatric physician states "I wish we could express our feelings and thoughts without the patient or the relatives or our seniors considering it a sign of weakness. If we were allowed to, it just might prove to be a better experience for the patient." (Pandrowala, n.d.). This highlights the need for systemic changes in healthcare services to support staff to accept their thoughts and feelings and to be able to express them. A positive outcome of these changes might be a reduction in burnout.

Implications for Clinical Practice and NHS Services

ACT as an Intervention to Reduce Burnout

I was struck by the lack of research exploring the causal mechanisms underlying burnout. My empirical study is valuable because it looked at these processes. Over 50% of participants appeared to be burnt-out, and 13% displayed symptoms of post-traumatic stress disorder. Given the growing shortage of UK oncology staff (The Royal College of Radiologists, 2017) and the association between burnout and oncology staff leaving the profession (Grunfeld et al., 2000), this is concerning.

One area that may hold promise is strengthening psychological flexibility (Frögéli, Djordjevic, Rudman, Livheim, & Gustavsson, 2016; Luoma & Vilardaga, 2013; Wersebe, Lieb, Meyer, Hofer, & Gloster, 2018). The findings of my empirical study suggest that those who were less psychologically flexible and engaged in more experiential avoidance were more likely to be burnt-out. While the findings of the study suggest a correlation, as opposed to causation, research has demonstrated ACT training as a mediating factor in reducing professional burnout (Hayes et al., 2004). The findings of the empirical study were concerning, but they also highlight significant avenues for an ACT intervention. The overarching concepts of ACT, mindfulness and psychological flexibility, and within this construct, reducing experiential avoidance, are skills individuals can be taught. Indeed, there is a growing literature of research demonstrating that ACT skills can be taught across a multitude of populations and professional groups. For example, special needs educators (Biglan, Layton, Jones, Hankins, & Rusby, 2013), mainstream school teachers (Franco et al., 2010), healthcare nurses (Foureur et al., 2013) and social workers (Brinkborg et al., 2011). These ACT skills have also been taught through a variety of mediums, for example, web-based delivery systems (Brown et al., 2016) one day training days (Waters et al., 2018), and smartphone apps (Kaipainen et al., 2017).

During my time on the clinical psychologist training course, ACT has had a growing role in my personal development. It has also played a significant role in my work with clients and MDT peers. I used part of my trainee CPD budget to fund completion of a Mindfulness course. This has had a positive impact on my psychological well-being and has become part of my day-to-day life. While is it too simplistic to separate psychological models into those that encourage change and those that encourage acceptance, I feel prior to learning about ACT, the majority of my psychological learning had focused on the former. ACT has been a refreshingly new foundation from which to make sense of and reduce psychological distress. Professionally, I have been able to support my colleagues by teaching them ACT and mindfulness skills, especially colleagues working in healthcare settings. This has been carried out both one-to-one and in groups. Seeing the positive impact this had on my colleagues contributed to pursuing my LSRP.

Call to Reduce Physician Work Load

My systematic review highlighted that healthcare systems across the world vary. However, a common feature amongst physicians appears to be long working hours. The review found research suggesting that this also correlates with higher levels of burnout. Indeed, Junior Doctors working within the European Union are supposed to adhere to working a maximum of 48 hours a week (averaged over a 26 week period). However, these rules appear to be ineffective at managing the working hours of these individuals, in-part due to the lack of penalties for working beyond these hours (Drolet, Sangisetty, Tracy, & Cioffi, 2013). While much of the focus of the LSRP has been concerning individual factors, of equal importance is the need for top-down systemic changes to protect oncology physicians from excessive workload.

Role of Clinical Psychologists

There is increasing recognition of the beneficial role clinical psychologists can play in healthcare teams (British Psychological Society, 2008). The number of clinical psychologists working in health is increasing, with their role and responsibilities broadening in healthcare settings across the UK (British Psychological Society, 2008). As the role of clinical psychology and psychologists has evolved, their utility in an economic climate of austerity as effective clinical leaders has been brought to the forefront. Clinical psychologists can offer a range of clinical, professional and strategic skills (British Psychological Society, 2010). This includes extensive knowledge of effective therapeutic models; an understanding of systemic issues and team dynamics; being able to facilitate reflective practice within teams; offering conflict management skills; and experience in constructing and designing services. Both presently and historically, they have been able to influence policy, and nurture service innovation (British Psychological Society, 2010). Clinical psychologists could also play a particularly useful role in providing 'umbrella' consultancy and supervision to staff in healthcare settings. Clinical psychologists are therefore well placed to increase access to psychological resources to reduce burnout.

Often described as a hallmark of the professional, clinical psychologists are trained using the scientist-practitioner or Boulder model (Rainy, 1950). Currently, there is a worrying lack of research into burnout within paediatric oncology staff, and as a consequence, an inadequate level of evaluative data on which to base future service design. Clinical psychology can assist in providing this data and devising policy based on empirical research due to skills in critical evaluation and comparison of research literature. Finally, a key ability that clinical psychology can offer is formulation. This work can directly help services and staff to look beyond immediate workings of a service and assist in understanding what is maintaining high levels of burnout.

Further Research

It is vital that effective interventions to reduce burnout are found for both oncology staff and those in other areas of healthcare. There is a definite message from the literature, with multiple clinicians and researchers going so far as requesting a call to action. They state that burnout is rampant and could have a disastrous effect on healthcare provision (Dyrbye & Shanafelt, 2011; Mahan, 2017; Moss, Good, Gozal, Kleinpell, & Sessler, 2016; T. Shanafelt, 2011).

A number of NHS trusts and health boards offer wellbeing services incorporating drop-in centers for physical and mental wellbeing support, e.g., Lancashire Teaching Hospitals NHS Trust ("Health & Wellbeing - Lancashire Teaching Hospitals," 2018). It would be beneficial to assess the efficacy of implementing brief training sessions on ACT based principles of psychological flexibility and more widely, mindfulness skills at these centers. ACT could also inform some other pre-existing interventions. Schwartz rounds are structured forums for healthcare staff to join together and describe the emotional impact of their work. ACT provides an evidence base underlying the processes at play. Those interested in attending Schwartz rounds could be informed that not only is taking part a cathartic experience but that the evidence base informs us that people who are open to emotions show improved psychological well-being and reduced burnout. Lower level interventions could also include low-intensity psychological supervision that is ACT informed. Trainers, for example in occupational health and human resources, could adopt this approach. There would even be scope to introduce ACT concepts at staff inductions or mandatory training. More directly, there is an opportunity to utilise the high usage of smartphones as an accessible means of delivering an intervention. Research should assess the feasibility and effectiveness of an app to train NHS staff in psychological flexibility and mindfulness. Kaipainen and colleagues (2017) recently found the Oiva ACT based training app showed promise in improving mental wellbeing and preventing burnout in Finish nurses. A full RCT utilising the Oiva app or similar smartphone-based programs is needed.

Further understanding around individual factors and elements found to be associated with lower burnout in oncologists would facilitate steps towards enhanced work-related well-being. The findings of meta-analysis in my systematic literature review suggested that oncologists appear to experience burnout at a lower rate than some of their colleagues in other specialities. While oncologists show a significant and concerning level of burnout, there seem to be factors which prevent or protect physicians in this discipline from the levels seen in other specialities, e.g., emergency medicine. Indeed, some burnout research has explored how high-level engagement with work is the antithesis of burnout (Maslach et al., 2008). The positive end of the MBI's emotional exhaustion, depersonalisation, and low personal accomplishment would be energy, involvement, and efficacy (Maslach et al., 2008) and can be measured using the Utrecht Work Engagement Scale (Schaufeli & Bakker, 2004).

Gillian Colville has produced a website (www.picupsychology.net/stresschecker) to help NHS staff monitor their level of burnout using the same aMBI measure used in the empirical paper. It has been created to facilitate the personal monitoring of burnout and is based on the idea that objectively knowing how you are doing may influence self-care. While being made aware that you may be experiencing burnout could prompt you to make changes, similarly, finding out that your burnout is at acceptable levels might be reinforcing and validating of your current coping strategies. It would be useful to combine this with an ACT app.

Impact and Dissemination

I have submitted my systematic review for publication in the European Journal of Cancer Care. The journal explores cancer care across multiple professions and currently has an impact factor of 2.104. The empirical study has been submitted and accepted to be presented at the World Cancer Conference taking place in Zurich, Switzerland (October 2018). The empirical paper has also been written in preparation for submission to the Psycho-Oncology journal. In addition, the findings of the research have been made available to all participants of the empirical study through a website (https://burnoutptsdoncology.wordpress.com), which all participants were invited to bookmark upon completion of the online questionnaire.

This website now displays the findings of the study (see Figure 1 for wording). Consideration was given to reporting the information in a way that provides a clear summary and condenses the often complex information so that it is accessible to staff who may come from a variety of backgrounds, including those who are not psychologically minded. Rather than just focusing on the high level of burnout, I was mindful that the potentially protective nature of psychological flexibility is highlighted. Sharing this information may be a low-level intervention in itself. A copy of the website wording is below. Given their vital role in the project, it is important that this information is also directly fed back to the staff at the individual research sites.

Figure 1. Wording of website disseminating results to participants.

Thank you for taking part in my research study.

The data collection has now finished, and the results have been analysed.

The prize draw to win a £100 voucher has now closed, and the randomly selected winner has received their prize.

I am very grateful to all the NHS staff working on paediatric oncology who were participants in the study. You carry out an immensely challenging job. I am in awe of the care and attention you provide for your patients.

Please read below for details of the findings,

Best wishes,

Matthew Yates

The study explored the prevalence of burnout and post-traumatic stress in paediatric oncology staff in England and Wales. In addition, the study also looked at the individual and organisational coping strategies used by staff.

I was also interested in how 'psychological flexibility' and 'experiential avoidance' are associated with these factors.

Psychological flexibility is a key concept of Acceptance and Commitment Therapy (ACT) . The term refers to the '…ability to fully contact the present moment and the thoughts and feelings it contains, without needless defense of avoidance, and, depending upon what the situation affords, persisting in or changing behaviour in pursuit of goals and values' (Hayes, Luoma, Bond, Masuda, & Lillis, 2006 in Bond et al., 2010 p. 297).

A coping style considered less psychological flexible is 'experiential avoidance,' the process whereby an individual actively attempts to evade situations/experiences due to the unpleasant thoughts, emotions and physical symptoms that are evoked in that person (Iglesias, de Bengoa Vallejo, & Fuentes, 2010).

The key findings were as follows:

Burnout

- Approximately 50% of participants were experiencing burnout, including 50% of nurses and 40% of physicians

Post-traumatic Stress

- 13% of the participants appeared to be experiencing significant levels of post-traumatic stress. While this part of the questionnaire is not able to diagnose post-traumatic stress disorder (PTSD), 13% of the participants had scores suggesting that they might be at risk. If you are concerned that you may be experiencing PTSD, please see details at the end of this post.

Individual Coping

- Active coping (proactively taking steps to eliminate or bypass a stressor, or to reduce its impact) and self-distraction were the most used individual methods of coping, closely followed by making use of emotional support

- Substance use in the form of alcohol or drugs was the least used method of coping

Organisation Support Strategies

- The organisational support strategy used most frequently by staff were attending debriefs and making use of clinical psychologist team input

Analysis of the data found relationships between the different factors

- Staff who showed greater psychological flexibility and less experiential avoidance showed lower burnout and post-traumatic stress

- This suggests that psychological flexibility and experiential acceptance may offer some protection from burnout

- Greater psychological flexibility and less experiential avoidance were associated with fewer symptoms of post-traumatic stress

- Higher levels of burnout were more likely in staff who used substances as a coping method

- Lower burnout levels were more common in staff who engaged in active coping, debriefs, and well-being training

- Those who used active coping, and attended well-being and group reflection showed lower rates of post-traumatic stress

- While post-traumatic stress risk was highest amongst staff who used substances more frequently to cope

- This suggests that more experiential acceptant forms of coping may reduce the chance of developing burnout and post-traumatic stress disorder

It's important to note that the above relationships were correlations, so we cannot assume one causes the other. However, it does suggest that there may be a link.

While it is unfortunate that a number staff are burnt-out or experiencing post-traumatic stress, the relationship found with psychological flexibility is very important as it provides us with possible interventions.

==Psychological flexibility is a skill which has research has been demonstrated can be taught to NHS staff. Studies have also shown that ACT skills training can reduce burnout (Hayes et al., 2004).==

There also appears to be many ways through which the training can be provided. Of particular interest are smartphones apps, which individuals can download and use at a time that is convenient to them.

Interest in monitoring your level of burnout?

Please visit picupsychology.net/stresschecker

Want to know more about increasing your own psychological flexibility and ACT?

Russ Harris has written a concise and very accessible book called "The Happiness Trap" which teaches the underlying concepts of psychological flexibility and ACT. Russ also has a YouTube channel with short, informative clips exploring many aspects of ACT and how you can use it in your life, see the links below.

The Happiness Trap book

Russ Harris YouTube channel

LSRP Overview

There were a number of highs and lows during the completion of this large scale research project. However, I have largely enjoyed undertaking the research. While managing every aspect of the project has been challenging, upon reflection, I am filled with a great sense of achievement. Three years ago, it was hard to imagine reaching this endpoint; the task felt overwhelming and unobtainable. The process has allowed me to develop as a researcher and given me the confidence to imbue the principles of a scientist-practitioner as I continue in my career as a clinical psychologist.

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