Systematic Review:

How has informal carer training about traumatic brain injury been evaluated?: A systematic review

Empirical Paper:

A qualitative exploration of brain injury training needs of practitioners working in third sector domestic violence organisations.

Submitted by Emily Clare Broadbridge, to the University of Exeter
as a thesis for the degree of Doctor of Clinical Psychology, May 2021

I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature: ……………Emily Broadbridge……………………………………………..

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Although my name stands alone as the author it has taken a great many people to bring these papers together.

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This thesis is written with love and with hope that people may benefit from its content.

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SCHOOL OF PSYCHOLOGY

DOCTORATE IN CLINICAL PSYCHOLOGY

LITERATURE REVIEW

How has informal carer training about traumatic brain injury been evaluated?:

A Systematic Review

Trainee Name: **Emily Clare Broadbridge**

Primary Research Supervisor: **Dr Alicia Smith**

DClinPsy Academic and Research Tutor,
Neuropsychology & Health Teaching Convenor,
Doctorate in Clinical Psychology, University of Exeter

Secondary Research Supervisor: **Professor Anke Karl**

Associate Professor of Clinical Psychology and Affective Neuroscience, College of Life and Environmental Sciences (CLES), Psychology, University of Exeter

Tertiary Research supervisor: **Dr Louise Gates**
Research Tutor, Doctorate in Clinical Psychology,
University of Exeter

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Abstract

Using the PRISMA protocol (Moher et al., 2009), this systematic review aimed to answer the question: How has informal carer training in traumatic brain injury been evaluated? And aimed to ascertain what training evaluation theory has been considered when designing the training evaluation. Six, subject specific databases were searched which led to identification of fifteen papers being included for review; four were qualitative, nine were quantitative and two were mixed methods. No training evaluation theory was reported to be considered when designing the evaluation. Most studies evaluated reactions to training and learning and no studies evaluated how the training impacted at a service level. Current popular theoretical models may be insufficient to capture information on the influencing environmental and interpersonal factors for informal caregivers which impact change at a behavioural and emotional level. The Integrated Training Transfer and Effectiveness Model may provide a solution to this theoretical problem identified by this review in caregiver training evaluation (Nielsen and Shepherd, 2022). The study concludes that utilising theory about training evaluation when considering evaluation for training could be useful for future informal caregiver training in thinking about different levels of evaluation and measuring the influencing factors to best understand the mechanisms of change.

Keywords: Traumatic Brain Injury, Psychoeducation, Training Evaluation, Informal Caregivers, Systematic Review

Introduction

In the field of traumatic brain injury (TBI), Neuropsychologists have advocated for training for people who have experienced TBI and their informal caregivers, to share important information about experienced difficulties and any intervention options to help improve recovery (Prince & Bruhns, 2017). How to evaluate this training and understand what constitutes best practice currently remains unclear. This review explores this challenge further to identify how existing training about TBI for informal caregivers has been evaluated and if training evaluation theory has been considered by the researchers. It begins by outlining the role of informal caregivers and the need for training, explores the gaps in the current literature and finally focusses on evaluation of training.

Why do Informal Caregivers Need Training on TBI?

Informal caregivers are the most common caregivers for people with TBI (Health and Social Care Act, 2012). There is a large variation within and between different countries/ literature bases about the definition of an informal care giver which is outside the scope of this paper to discuss (for fuller discussion see Sadler and McKevitt, 2013). For this paper, the definition of informal caregivers proposed by the United Nations Economic Commission for Europe’s (2019) will be utilised “*all non-professional care provided - by choice or by default - by family members (next of kin), friends, neighbours or other persons caring for people with long-term care needs at all ages, usually in private households*” (p.3). This definition covers different caregiver arrangements in terms of funding, for example in the UK informal caregivers may be able to claim a small benefit to help subsidise living costs if they care for individuals (https://www.gov.uk/carers-allowance), whereas these arrangements may not be possible elsewhere in the world (Liu et al., 2020); as these caregivers are non-professional caregivers, they would be considered an informal caregiver. Rotondi et al. (2007) found that informal caregivers wanted training on the sequelae of TBI and their implications such as information on how to respond and adjust to changes and aid recovery.

Delivering training to informal caregivers, on an individual or group basis, about TBI is important to help them manage complexities that they may encounter in supporting individuals with TBI (Gan et al., 2010). Designing and delivering standardised training for informal caregivers is complex due to the heterogeneous nature of injuries people sustain and the subsequent range of potential symptoms impacting cognitive and functional abilities (Lazaridis et al., 2019; Lazaridis et al., 2019; Kochanek et al., 2000). This variation means that individuals with TBI may present with very different comorbidities which may be lifelong (Hammond et al., 2019; Hoffman et al., 2019). These difficulties may be ‘visible’ such as physical injuries which require a splint or a crutch, however some disabilities may be ‘invisible’ and therefore harder for those supporting individuals to recognise, comprehend or know how to help such as difficulties with concentration or memory (Valera & Kucyi, 2017). Caregivers provide a range of practical support with activities of daily living (basic tasks that are essential to independent living e.g., toileting) and instrumental activities of daily living (more complex tasks e.g., managing finances) as well as emotional support and rehabilitation to individuals with TBI (Plöthner et al., 2019; Othman et al., 2021). Due to the heterogeneity of injuries, the extent of care required for injured individuals differs from limited, specific support to help with all areas of life (O’Callahan et al., 2011). There is a lack of general awareness in the public of the effects of TBI (Hux et al., 2006) and due to the heterogeneity of injuries each individual with a TBI will require different types of support which may vary over time (Tate et al., 2020). Therefore, training needs to be able to accommodate a range of social and aetiological factors as informal caregivers' knowledge of the impact of injuries may be lacking (Awadh Bamatraf et al., 2021).

The National Institute of Clinical Excellence provides guidelines for professional practitioners regarding competencies and expectations of good practice when working with individuals with head injuries (NICE; 2014). The NICE guidelines (2014) advocate for good communication from healthcare professionals about a patient with TBI's care and treatment with the caregivers. The guidance does not provide clarity as to what constitutes good communication or provide recommendations about what information should be shared with informal caregivers. Therefore, there is no formal or standardized education for informal caregivers supporting people with TBI despite them being the most common caregivers (Health and Social Care Act, 2012).

Existing Educational Interventions for People with TBI and Their Caregivers

Hart et al (2018) conducted a scoping review which aimed to summarise the educational interventions for people with TBI and their caregivers. The review describes 88 articles and found that there were a hugely diverse range of educational interventions in the literature, targeting different sequelae, for TBI survivors and caregivers. The review concluded that there was such a vast range of interventions currently that a systematic review of training interventions themselves would not be warranted at this time. Instead, the review advocates for the need for future research to be more precise in describing the evaluation and treatment components to better guide evaluation of 'active ingredients' of interventions-components which are essential to the positive outcome of the training (Nykänen et al., 2021). As the review was an initial scoping review and not a systematic review, it did not systematically describe *how* trainings were evaluated or describe if theoretical models of training evaluation were utilised in the studies. Scoping reviews aim to provide breadth, rather than depth, whereas systematic reviews aim to answer specific research questions (Tricco et al., 2016). A systematic review would therefore be appropriate to address the identified gap and answer the question which arises of *how is the training of informal caregivers currently being evaluated*? Using a systematic method to understand existing evaluation in the literature can help develop an understanding of what is needed for future researchers to determine if the training has the intended impact and understand what factors influence the intended outcomes of the training (Clarke et al., 2013). Effective evaluation can provide information on the most clinically and cost-effective ways to deliver education to informal caregivers which is important for all organisations and for the development of best practice (Kirkpatrick & Kirkpatrick, 2016).

To the authors knowledge there is currently no theory specifically relating to evaluation of TBI caregiver training, using models of evaluation from other literature bases may be useful in understanding current best practice for training evaluation. Evaluating training is important to 1) improve the training programme, 2) ensure transference of learning to behaviour change and thus organizational results and 3) demonstrate the value of the training programme (Kirkpartick & Kirkpatrick, 2016). Training evaluation is complex, and might be understood at different levels, for example the New World Kirkpatrick Model (NWKM) focusses on four levels, 1) people’s reaction to the training, 2) acquisition of knowledge, 3) change in behaviour and 4) the results of targeted outcomes at an organisational level (Kirkpartick &

Kirkpatrick, 2016). Whilst the NWKM of evaluation has predominantly been used to evaluate health care professional training in the health literature, the model has also been used to guide evaluation in informal caregiver training (Smidt et al, 2009; Moehead et al., 2020; Reed et al., 2021). Rigorous research methodology is foundational for evidence-based practice (Brownson et al., 2014), understanding how the current trainings have been evaluated and if training evaluation theory has been considered can aid our understanding of areas for improvement in evaluation methodology for the development of good practice for future researchers. The current review will address a gap in the existing literature by reviewing how training for informal caregivers about TBI has been evaluated and what training evaluation theory has been considered.

Aims and Research Question

The current review will aim to ascertain how training for informal caregivers about TBI has been evaluated in the existing literature and what training evaluation theory has been considered in designing the evaluation.

The systematic literature review will aim to answer the question: How has informal carer training in traumatic brain injury been evaluated?

Method

The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA; Moher et al., 2009) was utilised to conduct the systematic review (see Appendix A for checklist).

Eligibility Criteria

To determine eligible studies Population, Intervention, Comparator, Outcome (PICO; Higgins & Green, 2011) criteria were used; see Table 1 below.

Table 1.

Eligibility Criteria using Population, Intervention, Comparator, Outcome and Study Design (PICOS)

PICOS	Description of Detail	
	Inclusion Criteria	Exclusion Criteria
Participant	- Studies that have education programmes for informal caregivers such as family members (including parents, siblings, relatives and spouses/ partners), who may or may not attend with the person with TBI.	- Samples including child participants (under the age of 18) - Intervention aimed only at individuals with TBI
Intervention	- Any type of traumatic brain injury awareness or knowledge training including generic psychoeducation (e.g. various mechanisms of injury) and/or education including, for example, psychological, social and physical consequences of TBI. - Any type of Acquired brain injury education including information specifically about traumatic brain injury (e.g. how the brain becomes injured and consequences from TBI).	- Brain injury prevention programmes - Acute stage interventions with a medical focus (i.e., when in critical care) e.g. how much oxygen to give people when they arrive unconscious following TBI. - BI training where the psychoeducation intervention is not described
Comparators	- Foci of evaluation e.g. caregiver burden types of evaluation methodology employed, what evaluation literature considered and when evaluation occurred and period of longer term follow up.	
Outcomes	- Effects of the training, outcome measures such as difference in	

	baseline scores in pre-post measures (for example for life satisfaction and general wellbeing Life Satisfaction Index (Wood et al., 1969), behavioural change (measured for example percentage change in target behaviours relative to the baseline of each behaviour), attitude change, change in practice, change in responses, increased understanding, increased confidence/ comfort in working with individuals with BI (for example measured with the Rehabilitation Situations Inventory; RSI; Dunn, et al., 1992 Lee et al., 2019).	
Study Design	- Qualitative designs - Quantitative designs - Mixed method designs - Experimental designs - Quasi- experimental designs	- Single case designs - Systematic reviews or meta-analyses
Report characteristics	- Full text research article - Peer reviewed. - All years - Published in English (or translated by journal)	- Theses - Chapters of books - Abstract only e.g., conference proceeding. - Published in any language other than English - Non- peer reviewed articles published as abstracts or conference proceedings only. - Reviews, commentaries, and editorial articles.

Information Sources

Relevant literature was identified by systematically searching subject specific databases on 24th September 2020 and 29th January 2022. These were EBSCO (including CINHAL Complete and Psychology and Behavioural Sciences Collection), Ovid (including Psychoinfo, Psycharticles and PsychExtra) and PTSDpubs databases. References of included papers and citations were reviewed to ensure relevant papers were not missed. The search was not restricted by date. References included in the review published by Hart et al. (2018) were also checked. The search strategy did not include grey literature. While Cochrane Reviews strongly recommend including grey literature it is not deemed essential for systematic reviews (Lefebvre et al., 2019), recent research has shown negligible change in results due to its inclusion (Hartling et al., 2017) and weighing against the potential for lower quality research against the feasibility due to limited resources of searching the literature the decision was made to not search grey literature.

Search Strategy

Key search terms were entered into databases. Truncation and Boolean operators were utilised to ensure all variations of key words were included, see Table 2.

Table 2

Search Terms for Ovid Databases

Category	Keyword	Alternative words (combined with OR with the keyword)
Category 1	Brain Injury	Traumatic brain injur* or acquired brain injur* or concussion* or Head injur* or Brain injur* or Concussive injur* or Head trauma*
Category 2	Training	Educat* or teach* or education adj program* or psychoeducation or intervention* or train*
Category 3	Caregiver Family Professional	Carer* or Caregiver* or professional* or staff* or parent* or mother* or father* or famil* or sibling* or assistant* or worker* or teacher* or officer* or work force* or agent* or Occupational therap* or speech and language therap* or Physiotherap* or social worker* or police or nurs* or paraprofessional* or doctor or Independent Domestic Violence Advisor* or IDVA or OT or SALT or SLT or neuropsycholog* or clinical psycholog* or support adj worker or rehabilitation adj assistant or charity worker* or health adj care adj professional* or health adj care adj worker* or solicitor* or lawyer* or barrister* or general practitioner*
Search Combined		Category 1 AND Category 2 AND Category 3

Study Selection

All references were exported to reference management software (Endnote) and duplicates were removed. Following this, records were screened for inclusion by comparing title and abstract to the PICOS criteria (see Table 1). Although the search terms included professional participants, only papers whose participants were caregivers were included in this study. Following screening, the eligible full texts were compared to the PICOS criteria. To reduce bias and errors, six full texts were evaluated by an independent clinical researcher to ensure reliability of the screening process. The review process yielded 100% inter-rater reliability and a kappa coefficient of 1.0 (McHugh, 2012). References and citations for each included article were reviewed to ensure all relevant papers were identified.

Data Extraction Process

A Microsoft Excel document was used to extract data relevant to the review by the primary reviewer. This included information about the authors, country, design, sample, intervention, outcome measures and results/ main findings and evaluation theories (see Tables 3, 4 & 5).

Quality Appraisal

Quality appraisal was completed with each study to evaluate the risk of bias in individual studies as per PRISMA protocol (Moher et al., 2009). Qualitative studies and qualitative data from mixed methods studies were evaluated using the Clinical Appraisal Skills Programme (CASP; Critical Appraisal Skills Programme 2018; see Appendix B). The CASP is a 10-item rating scale which assesses domains to determine if the study is valid, what the results are and if it is useful locally and is the most used quality appraisal tool in health and social care qualitative evidence synthesis (Long et al., 2020). The CASP has no formal scoring criteria; however, for the purpose of evaluation for this review a scoring criterion was applied. Each section was scored 1 if the criteria was completely met, 0.5 if the criteria was somewhat met and 0 if the criteria was not met or no information was given to evaluate it. The maximum score per study was therefore 10. Scores between 0 and 4 were rated as a weak, 4.5-7 of moderate and 7.5-10 as strong.

Quantitative studies and quantitative data from mixed methods studies were evaluated using the Quality Assessment Tool for Quantitative Studies (QATQS; Thomas et al, 2004; see Appendix C). The QATQS was utilised as it evaluates the study design, recruitment, measures, and attrition biases and can therefore be used to develop recommendations as well as assess quality. The QATQS has acceptable reliability (Armijo-Olivo et al., 2012) and content and construct validity (Thomas et al., 2004). To enhance the reliability of the appraisal, three studies were evaluated by an independent second rater. The measured Cohen’s Kappa for the two ratings was 1.0, indicating complete agreement (McHugh, 2012).

The rationale for applying different quality rating scales was that whilst an alternative appraisal tool such as the Mixed Method Appraisal Tool (MMAT; Hong et al., 2018) could have been utilised more broadly, separate evaluation tools were selected to provide a more detailed understanding of the relative strengths and weaknesses of the methodological constructs of each study (Majid & Vanstone, 2018). The appropriateness of applying different quality appraisal tool depends on the research question being asked. The current study aims to explore, in detail, the methods of evaluation used in the included studies and thus a key element of this critical appraisal is *descriptive* in providing detail about methodologies employed and methodological quality. Using more detailed and separate quantitative and qualitative evaluation tools for this study helps in identifying gaps in knowledge and understanding if the reader can trust the results (Booth et al., 2012).

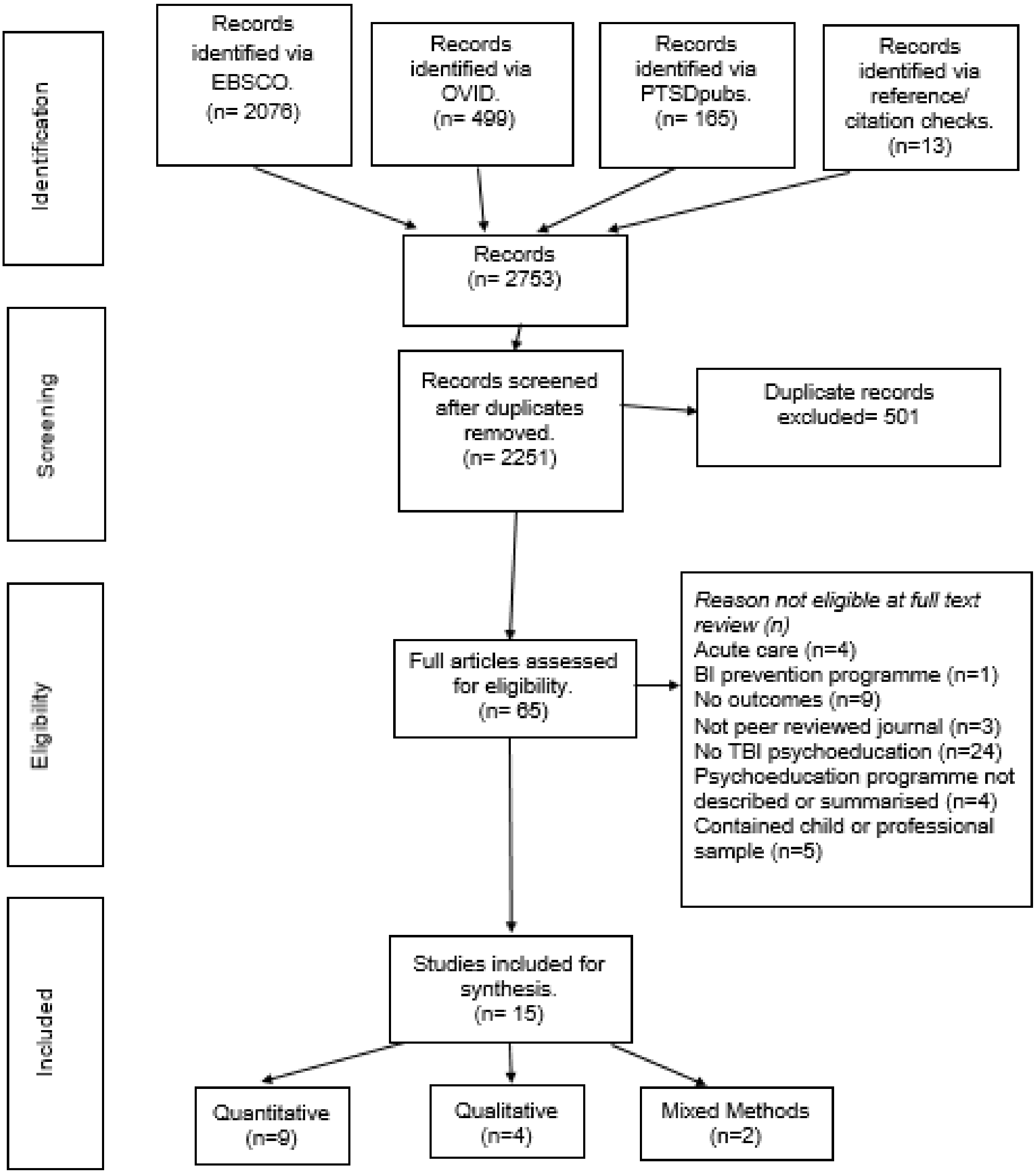
Results

Study Selection

Figure 1 shows the results of the screening and reviews based upon the PRISMA Protocol (Moher et al., 2009).

Figure 1.

Results of literature review search strategy and screening. Flow chart based upon PRISMA Protocol (Moher et al., 2009).



Tables 3, 4 and 5 summarise the studies included in the review, organised in alphabetical order and by study design type (quantitative, qualitative then mixed methods). For breakdown of quality appraisal scores see appendix D.

Table 3.

Summary of Quantitative studies' evaluation methods.

	Study	**Design/ Sample/ Setting**	**Aim/ hypotheses/ objectives**	**Outcome evaluated**	**Measures/ approaches used and how outcomes were evaluated**	**QATQS rating (1= strong, 2, moderate, 3 weak)** **Strengths and limitations**
1.	Baseotto, & Godfree (2017)	**Design:** Cohort design. Outcome measures completed pre and post intervention **Sample:** 75 people attended course, outcome measures were reported from 25 people with TBI and 12 family/carers. Difference due to incomplete either pre or post measures, reasons described. **Setting:** Community acquired BI Rehabilitation	**Aim:** To increase participants knowledge and confidence in managing common physical, cognitive, emotional and special sequalae of ABI.	1) Knowledge 2) Confidence	**Measures used:** Participants completed Likert scale responses. Q 1-5 (1= no knowledge, 10= very detailed knowledge) Q6- (scale was 1= not confident at all to 10= very confident) 1) Acquired BI 2) Physical consequences 3) Cognitive consequences 4) Emotional and behavioural Consequences 5) Support or services that are available 6) Confidence managing consequences **Statistical analysis:** - Descriptive statistics - Paired samples t-test between pre and post measures.	**QATQS Global rating:** Weak **Strengths:** - Same manualised intervention applied across groups. - Consideration given for future directions for research. - Not randomised - High attrition - Small sample size, no power calculation - No control group. **Limitations:** - Subjective outcome measures not reliable or validated. - Unclear how participants were

		Unit, Dorset, UK				recruited. - Unclear if ethical considerations - Unclear how many participants had ABI or were family/ carers
2.	Bushnik, Kreutzer, Marwitz, Sima & Godwin (2015)	**Design:** Prospective, randomised, controlled repeated-measures design. Wait list control. Measures pre, post and 3-month follow-up. Control group were offered intervention after follow-up completed. **Sample:** 80 parents, spouses, partners, significant others, or close friends of individuals with ABI. **Setting:** Outpatient Rehabilitation Centre, Virginia, USA.	**Hypotheses:** 1) Participants in the treatment group will show an increase in met needs, reduced burden, and a more positive perception of community based services in comparison to controls 2) Gains apparent at completion of treatment will remain apparent at 3-month follow up.	1) Needs of the family after BI 2) Accessibility of community BI services 3) Caregiver burden	**Measures used:** Family needs questionnaire (Kreutzer & Marwitz; 1989)- 37 item self-report questionnaire of family members perceived needs after BI. Participants rate degree to which each need has been met (not met, partially or met, however for study converted to 10-point Likert scale). Services obstacles scale (Marwitz & Kreutzer; 1996)- One subscale of the SOS was used ‘satisfaction with treatment resources scale’ to evaluate accessibility of community based BI services. Seven-point Likert scale from strongly disagree to strongly agree. Zarit Burden Interview (Bachner & O’rourke; 2007)is used to quantify caregiver burden.4 point Likert scale (never to nearly always). **Statistical analysis:** - Descriptive statistics - Multivariate longitudinal modelling.	**QATQS Global rating:** Strong **Strengths:** - Randomised controlled study. - Confounders considered in detail. - Validated and reliable standardised outcome measures. - High attrition. **Limitations:** - Unclear if blinded. - Unclear if people with ABI consented to their family members attending. - No longer term follow up after 3 months.
3.	Fortune, Rogan & Richards, (2016)	**Design:** Waiting list-controlled	To deliver and evaluate the effectiveness of a	1) Motor functions of person with BI 2) Cognitive functions	**Outcome measures:** Functional Independence Measure/ Functional Assessment Measure (FIM/FAM;	**QATQS Global rating-** Weak

		intervention study. Outcome measures completed Pre and post intervention and at 3 months follow up. **Sample:** Family carers for people with ABI (47% parents, 44%spouse/ partner, 5% son/daughter and 4% sibling). 78% eligible agreed to participate. **Setting:** Multi-centre study with four neurological rehabilitation centres in the Republic of Ireland.	structured multicomponent carers programme on carer stress and strain, on the level of critical comments between the caregiver and person with an ABI, and on carer's levels of emotional distress.	of person with BI 3) Caregiver strain 4) Emotional distress	Turner-Stokes et al., 1999)- 30-item rating scale with each item scored on seven levels which range from totally dependent to totally independent. Carer Strain Index (CSI; Robinson, 1983) is a 13- item scale measuring perceived strain or caregivers using yes/ no responses. Perceived Criticism Scale (PCS; Hooley & Teasdale, 1989)- is a 10-point Likert scale ranging from not at all critical to very critical and was used to measure criticism of patient towards carer and from carer towards patient. Hospital anxiety and depression scale (HADS; Zigmond & Snaith, 1983) is a 14-item self-report scale assessing symptoms of anxiety and depression and was used as a general measure of emotional distress. **Statistical analysis:** - Descriptive statistics - Independent samples t-test, Pearson's correlation coefficient and chi-squared tests.	**Strengths:** • Case-control study design • Standardised measures • Moderate attrition • 3 month follow up data **Limitations:** • Not randomised • High attrition • Unclear if confounders such as difference in income • No blinding • Small sample size, no power calculation • No control group
4.	Knapp, Gillespie, Malec, Zier & Harless (2013)	**Design:** Cohort design with Pre- post measures. **Sample:** 9 **f**amily members, relatives or care givers of a person admitted to inpatient rehabilitation with acquired BI. Age	To assess the educational benefit of the virtual dialogue method to increase the general knowledge of ABI among family members and caregivers of patients with ABI.	1) Knowledge of BI 2) Attitude towards method of training	**Outcome measures:** *Knowledge Questionnaire*- created by authors. 21 questions pertaining to basic knowledge of BI. *Attitude survey*- six item survey with 5-point Likert scale answers to assess participants comfort level of engaging with the virtual expert, satisfaction with conversation and sense of learning. **Statistical analysis:** - Descriptive statistics - Wilcoxon signed ranks test	**QATQS Global rating-** Weak **Strengths:** • Good attrition • First study to evaluate virtual dialogue for BI psychoeducation. • Standardised measures

		range 26-56, average 46.4 years. Four men, 5 women. 8 data sets analysed as one couple completed together, their scores were averaged. **Setting:** Midwestern, free-standing rehabilitation hospital, USA.			- Graph of raw scores for attitude survey	**Limitations:** • Limited statistical analysis • Limited sample size • Measures may not be reliable or valid
5.	Kreutzer, Marwitz, Sima, Graham, Hsu, Mills & Lukow, (2020).	**Design:** Two arm parallel randomised controlled trial with wait list control with pre and post measures. **Sample:** 75 couples, one person with ABI and their partner (45 intervention, 30, wait list control). **Setting:** Unknown where groups conducted, Virginia, USA.	Primary hypothesis: participants receiving intervention would demonstrate improvement in relationship quality as compared with those not receiving intervention.	1) Relationship quality between couples 2) Marital stability and potential for divorce 3) Neurobehavioural functioning 4) cognition, behaviour and mood	**Outcome measures:** Revised Dyadic Adjustment Scale (RDAS; Busby et al.,1995)- 14-item scale using 0-4- or 0-5-point Likert response measuring couples appraisal of relationship quality. Marital Status Inventory- 14 item questionnaire was used as a baseline measure of marital stability and determines the potential for divorce or separation Neurobehavioral Functioning Inventory (NFI) 70 item questionnaire measuring problem frequency on a 5-point Likert scale. **Statistical analysis:** - Descriptive statistics - Doubly repeated linear mixed effect model	**QATQS Global rating:** Moderate **Strengths:** - Low drop out - Randomised controlled trial - Confounders considered and adjusted for - Outcomes measures reliable and validated **Limitations:** - Knowledge increase not measured - Investigators not fully blinded - Relatively small sample size - No longer term follow up after 3

						months.
6.	Kreutzer, Stejskal, Ketchum, Marwitz, Taylor & Menzel (2009)	**Design:** Cohort design with Pre- post measures, immediately after and 3 months follow up. **Sample:** 53 people with ABI and their families. **Setting:** Post-acute setting across multiple sites, USA.	No aim, objective or hypothesis was reported in the body of the text. In the abstract the objective was stated as "To evaluate the benefits of the Brain Injury Family Intervention (BIFI) for families of persons with acquired brain injury and identify factors related to outcomes"	1) Needs of the family after BI 2) caregivers perceptions of quality and accessibility of community BI services 3) Family functioning 4) Psychological distress 5) Wellbeing of caregivers	**Outcome measures:** Family needs questionnaire (Murray et al., 2006)- 37 item self report questionnaire of family members perceived needs after BI. Participants rate degree to which each need has been met (not met, partially or met, however for study converted to 10 point Likert scale). Services obstacles scale (Marwitz, & Kreutzer, 1996)- Six item scale using 7-point Likert responses, evaluates caregivers perceptions of quality and accessibility of community BI services Family Assessment device (FAD; Kabacoff et al., 1990)- 60 item questionnaire assessing diverse aspects of family functioning, the study used a subscale the 12 item 'general functioning scale' rated using 4-point Likert scale. Brief symptom inventory-18 (BSI-18; Derogatis, 2000)- 18 item self-report instrument of psychological distress. Satisfaction with life scale (SWLS; Diener et al., 1985)- 5 statements on a 7-point Likert scale which assess global satisfaction with life and was used as a measure of subjective wellbeing of caregivers. **Statistical analysis:** - Descriptive statistics - Repeated measures mixed models to measure means of each outcome measure over time. - Autoregressive variance- covariance	**QATQS Global rating** Weak **Strengths:** - Used standardised measures. - Measures reliable and valid. - Confounders controlled for - Detailed statistical analysis and write up. **Limitations:** - No control group, therefore, no blinding. - Unclear how sample recruited, where from or when. - No aims

					structure to model correlations over time within subjects.	
8.	Sinnakaruppan, Downey & Morrison (2005)	**Design:** Longitudinal, mixed variables, within and	The key aims of this pilot study were to: (a) indicate the value of and (b) gain	1) Anxiety 2) Depression 3) Somatic symptoms 4) Social dysfunction	**Outcome measures:** Hospital anxiety and depression scale (HADS; Zigmond & Snaith, 1983) is a 14-	**QATQS Global rating:** Moderate **Strengths:**
7.	Man (1999)	**Design:** Cohort design with Pre-post measures, immediately after and 3-months follow-up. **Sample**: Family members with a member who has ABI. **Setting:** Hong Kong, China	The aim was to investigate the demographic characteristics of families with brain-injured members with their empowerment status and to evaluate the effectiveness of an 8-week empowerment programme.	1) General health 2) Self-efficacy 3) Level of support received 4) Burden and stress	**Outcome measures:** Chinese version of the General Health Questionnaire (GHQ; Shek, 1989) is a 30-item questionnaire. Empowerment questionnaire (Man, 1998)- 52- item questionnaire including matters such as communication patterns, financial/ social support, functional independence (physical, cognitive and behavioural), personal independence, family size and education of family members Unknown measure of self-efficacy- a measure of self-efficacy to monitor families' abilities to do physical self-care activities, behavioural and emotional problems, cognitive deficits and social problems of brain injured members it is unclear how this was assessed. Other: level of support received (substantial systems and emotional support) and burden/ stress were reportedly monitored however it was unspecified how these were measured **Statistical analysis:** - Descriptive statistics - One way ANOVA - Paired t-tests	**QATQS Global rating:** Weak **Strengths:** - Some standardised measures - Some measures reported good validity and reliability. - Broad recruitment - Low dropout rates - Confounders analysed and reported upon **Limitations:** - Statistics variably reported. - Unclear how some factors measured. - No control group, therefore, no blinding

		between subject's design. Pre and post intervention and 3 month follow up. **Sample:** 50 family carers (25 experimental, 25 wait list control, randomly allocated). Control group had no educational input util after initial study done. **Setting:** Douglas Grant Rehabilitation Centre, Scotland	information with a view to designing an efficient larger scale research study investigating the impact of an educational programme for family carers and patients. The practical objectives were to improve caregiver's and head injury patients' psychological health by reducing anxiety and depression and improving self-esteem and coping skills and to develop helpful 'user friendly' materials for carers and patients.	5) Self esteem 6) How people respond to stress 7) Motor and cognitive abilities of people with BI	item self-report scale assessing symptoms of anxiety and depression. The General Health Questionnaire–28 (GHQ-28; Goldberg, 1978)- 28-ite screening to detect psychiatric disorders measuring somatic symptoms, anxiety and depression, social dysfunction and severe depression. The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1989) 10-item self-report questionnaire uses a 4-point Guttman Scale of agreement or disagreement to statements which gives an overall score of high, normal or low self-esteem. The COPE Scale (COPE; Carver et al., 1989)- 60 item multidimensional inventory assessing ways which people respond to stress. The Functional Independence Measure (FIM; Granger & Gresher, 1984) 18 item questionnaire measuring motor and cognitive abilities. **Statistical analysis:** - Descriptive statistics - One way ANOVA - Paired t-tests - Chi-square	- Control group and randomisation - High attrition - Reliable and valid standardised measures - Strong statistical analysis - Detailed write up - **Limitations:** - Researchers not blind to conditions - Participants not blind to conditions
9.	Suzuki & Tanemura (2011).	**Design:** Cohort design pre and post measures and three- and six-month follow-up. **Sample:** 16 participants who were family members	To verify the effect of an interventional programme which uses communication skills training as a core, applying assertiveness training in order to reduce psychological distress of family caregivers of persons with TBI.	1) Mental health 2) Depression 3) Anxiety 4) Assertiveness	**Outcome measures:** The General Health Questionnaire- 30 (GHQ-30; Goldberg, 1978) 30 item measure for screening of mental health status of participant. Japanese version used (Nakagwa & Obo, 1985). Self-rating depression scale (SDS; Zung, 1965)- 20 item questionnaire examining depression symptoms. Japanese version used (Fukuda & Kobayashi, 1983).	**QATQS Global rating:** Weak **Strengths:** - No drop out. - Ethics considered. - Validated measures. - Reliable

	(mother, wife or father) of people with TBI **Setting:** Kobi and Osaka sites, Kinki, Japan			Stated Trait Anxiety Inventory (STAI; Spielberger et al., 1970) 40 item questionnaire measuring state (how participant feels at the present moment) and trait (how participant generally feels) anxiety. Japanese version used (Mizuguchi et al., 1991)). Rathis Assertiveness Schedule (RAS; Rathus, 1973) 30 item questionnaire assessing assertiveness. Japanese version used (Shimizu et al. 2003). **Statistical analysis:** - Descriptive statistics - Multiple regression analysis	measures. - Multiple follow-ups. **Limitations:** - Little statistical analysis. - Low sample size. - High chance of selection bias. - Confounders not considered.

Table 4.

Summary of Qualitative studies' evaluation methods.

Study	Design/ Sample/	Aim/ hypotheses/	Outcome evaluated	Measures/	CASP rating (1= strong, 2,

		Setting	objectives and participants.		approaches used and how outcomes were evaluated	moderate, 3 weak) Strengths and limitations
10	Couchman, McMahon, Kelly & Ponsford (2014)	**Design:** Qualitative study. Focus group interviews analysed using thematic analysis**.** **Sample:** 29 people with ABI and 30 family care givers **Recruitment:** Recruited opportunistically from the Headstart Programme **Drop out:** Initially 41 people with ABI and their carers (total 82, therefore 70% attrition) **Setting:** 2 suburban locations in Australia.	The present study aimed to evaluate qualitatively the use of MFGT for ABI using focus group data. By examining the experience of group participation from the perspectives of both individuals with ABI and their family members, the study aimed to elucidate the processes underlying and factors influencing success of MFG programmes with families impacted by ABI, and inform future programmes.	1) Experience of the group 2) Personal impact of the group 3) Challenges in the group 4) Their experience of each component of the group (i.e., education component, sharing stories, problem solving, socialisation) 5) Changes they might make to the program	**Data collection approach:** Semi- structured Focus group interviews which aimed to explore the participants experiences to expose the factors influencing success and underlying processes of multi-family group programmes for people impacted by BI. The interview schedule consisted of six prompts inviting participants to discuss their experience of the group and its personal impact, challenges in the group, their experience of each component of the group (i.e., education component, sharing stories, problem solving, socialisation), and changes they might make to the programme. **Data analysis:** Data were analysed using thematic analysis.	**CASP score=** 6.5 (moderate) **Strengths:** - Robust analysis with consideration to epistemology - Good balance between information and group sharing experiences - Strong validity of results **Limitations:** - People with ABI struggled to share their views due to communication difficulties. - Respondent validation not considered. - Researchers did not consider their positionality in analysis
11.	Donnelly, Goldberg &	**Design:** Qualitative design using	The objective of this qualitative study was to	1) Why they signed up 2) What they	**Data collection approach:**	**CASP score=** 8 (strong)

	Fournier (2020)	semi-structures individual interviews analysed using inductive content analysis. **Sample:** 13 people with TBI and 3 carers who were relatives. **Setting:** Unites States and Canada	explore the experience of individuals with TBI and their caregivers who have participated in LoveYourBrain Yoga. Our study explored participants' (1) motivations for joining the program, (2) perceptions of the benefits of participating, and (3) perceptions of any areas for improvement.	remembered 3) What they found most helpful 4) What could be improved 5) Caregivers were asked questions about their perceptions about the experience of the person with a TBI whom they accompanied	An interview guide was developed to facilitate the semi-structured interviews based on the framework outlined by Kallio et al. (2016). This interview guide contained prompt questions to solicit participants' perspectives about why they signed up for LoveYourBrain Yoga, what they remembered from each session, what they found most helpful, and what they felt could be improved. Caregivers were asked a few additional questions about their perceptions about the experience of the person with a TBI whom they accompanied. **Data analysis:** Data were analysed using Inductive Content Analysis.	**Strengths:** - Respondent validation - Clear research aims and rigorous methodology and analysis. - Researcher considered relationship to the participants. **Limitations:** - Low number of carer participants - No mention of ethical consideration High interest, low uptake, unclear why
12.	Lauer-Listhaus (1991)	**Design:** Qualitative design using open ended questionnaire. Analysis strategy unknown. **Sample:** 16 family care givers for people with ABI	No aims, objectives or hypotheses reported in main text or abstract.	No details of evaluation but outcome assessment section indicates questions were answered about 1) what was useful 2) What they learnt	**Data collection approach:** Open ended questionnaire completed by each participant at the conclusion of the group, unclear what the purpose of the	**CASP score= 1**.5 (weak) **Strengths:** - Recruited the relevant population - Good description of intervention **Limitations:**

		Setting: Day treatment cognitive rehabilitation programme. New York, USA.			questionnaire was. **Data analysis:** Unknown how data were analysed.	- No research question or aims. - No details of qualitative methodology - No details of questions asked - Unknown how data were analysed - Findings unclear - No details of ethical considerations - No validation or trustworthiness considered.
13.	Straits-Tröster, Gierisch, Strauss, Dyck, Dixon, Norell & Perlick (2013)	**Design:** Qualitative study using focus groups and qualitative content analysis to identify themes. **Sample:** 8 Veterans with TBI and 8 family caregivers **Setting:** Not detailed. USA.	This study had two aims—to examine acceptability and perceived outcomes among veterans with TBI and families who participated in an initial trial of a psychoeducational multifamily group treatment for TBI and to obtain participants' views and ideas for improving the intervention and its delivery, including engagement of veterans and families.	1) Experiences before and during group treatment 2) Aspects of treatment that were helpful 3) What could be improved to optimize the intervention	**Data collection approach:** Following the intervention participants were invited to participate in a 90-minute focus group using a interview schedule (unclear if structured or unstructured). Groups were conducted by the study clinicians, using a moderator's guide developed by the study team and adapted from prior studies (7). Participants were asked about their experiences before and during group treatment (for example, "What were some of the problems you were struggling with when you joined	**CASP score= 6**.5 (moderate) **Strengths:** - Clearly defined aims and methodology - Clear description of qualitative methods - Strong recommendations **Limitations:** - Relationship between researcher and participant not considered - Trustworthiness and credibility not reported - No ethical considerations reported

this group? In what ways did you personally benefit from the group?") and views about aspects of treatment that were helpful or that could be improved to optimize the intervention (for example, "How would you improve the multifamily group experience?").

Data analysis:
Data were analysed using 'methods informed by qualitative content analysis'.

Table 5.

Summary of Mixed Methods studies' evaluation methods.

Study	Design/ Sample/ Setting	Aim/ hypotheses/	Outcome evaluated	Measures/ approaches	QATQS/ CASP rating (1=

			objectives and participants.		**used and how outcomes were evaluated**	**strong, 2, moderate, 3 weak)** **Strengths and limitations**
14.	Kreutzer, Stejskal, Godwin, Powell & Arango-Lasprilla (2010)	**Design:** Mixed method triangulation, cohort design. Quantitative and qualitative measures after each session and at the end of the programme. Qualitative feedback was analysed using Modified Grounded Theory inductive data analysis. **Sample:** 76 family or friend care givers and 76 patients with ABI **Setting:** Outpatient rehabilitation setting in a major academic medical centre, Virginia, USA.	The first objective was to describe and compare caregivers' and patients' perception of the intervention's helpfulness. The second was to characterize and compare intervention goal attainment ratings [6,47,52] of caregivers and patients. The third objective was to examine the relationship between helpfulness and goal attainment ratings to participant demographic and injury characteristics. Finally, the "most important things learned" by participants consequent to each BIFI session was examined and evaluated.	1) Learning (goals attained and helpfulness) 2) Satisfaction with programme 3) Most important things learnt 4) How helpful 5) How could be improved	*Quantitative* **Outcome measures:** **Learning Survey** is a two-part self-report measure given to participants and completed after each session. Assesses perceptions of goal attainment and helpfulness on 5 and 4-point Likert scales respectively. **Program Satisfaction Survey:** completed after final session. 4-point Likert question about helpfulness. Yes or no question about recommend to a friend. **Statistical analysis:** - Descriptive statistics - Chi square - Pearson Product moment Correlational analyses - Paired samples t tests - Repeated measures mixed effects models *Qualitative* **Data collection approach:** **Session Report Form:** Asked participants to record 'most important things learnt in this session' and answers recorded verbatim.	**QATQS Global rating-** Weak **CASP score= 5**.5 (moderate) **Strengths** - Detailed statistical analysis - Cohort characteristics examined statistically - Large number of participants - Clear objectives **Limitations** - Dropout unknown - No blinding - Unclear how qualitative data collected - Researcher relationship with participant not considered - Measures not validated - No discussion about trustworthiness, credibility or rigour

					Satisfaction Survey: Qualitative questions about how the program was helpful to them and their family and how the group could be improved. **Data analysis:** Data were analysed using the framework of Modified Grounded Theory.	
15.	Sander, Clark, Atchison & Rueda, (2009)	**Design:** Mixed method, embedded, cohort design with quantitative post measures and qualitative 18 month follow up telephone interview. **Sample:** 15 care givers to adults with TBI ranging from mild- severe. 73% parents, 20% spouses/ partner and 7% 'other', not defined. **Setting:** Conducted via web link to West Texas A&M University and other educational establishments. Rural communities in Texas, Oklahoma Pan handle and Eastern New Mexico.	The purpose of the current article was to describe the development and implementation of a Web-based, videoconferencing training program for caregivers of adults with TBI in rural areas to manage cognitive and behavioural changes in the person with injury. Feasibility of this type of intervention will be addressed, and caregivers' satisfaction with the intervention and their perceptions of its long-term utility will be described.	1) Problems following TBI 2) How much person with TBI supervised 3) Burden 4) Overall satisfaction with the information provided, 5) what they felt they had learned, 6) Whether they would recommend the sessions to others	*Quantitative* **Outcome measures:** - Problem checklist (PCL; Kay et al, 1995) from the head injury family interview. 43-item questionnaire using 7-point Likert scale to explore common symptoms post TBI. Two forms one for caregiver and one for the person with TBI which ask whether the symptom is a problem or not and caregiver asked to rate the impact on daily functioning of the symptom. - Supervision rating Scale (SRS; Boake, 1996)- Supervision refers to someone being with the patient. The questionnaire asks the caregiver to rate what level of supervision the	**QATQS Global rating:** Weak **CASP score=** 4 (weak) **Strengths:** - There was a clear statement of aims - The study had ethical approval - Qualitative addition appropriate to further explore participants experiences. **Limitations:** - Details of how intervention implemented was not reported - Recruitment unclear - Reasons for drop out unknown - Participant characteristics not reported - Not reported how quantitative data collected

	caregiver believes the patient needs. They select a 1-13 scale which is then split into 5 categories of levels of supervision from ‘Level 1: independent’ to ‘level 5: Full time direct supervision’. - Perceived burden subscale of the modified caregiver appraisal scale (MCAS; Lawton et al., 1989)- 35 item questionnaire utilising a 5 point Likert scale assessing multidimensional aspects of the care giving role. Four factors are analysed caregiver satisfaction, caregiver ideology, caregiver mastery and perceived burden. - Satisfaction survey- 4 point Likert scale survey completed after each module enquiring about three areas 1) overall satisfaction with the information provided, 2) what they felt they had learned, and 3) whether they would recommend the sessions to others. **Data analysis:** - Descriptive statistics - Means and summed scores displayed in tables.	- Confusing results section. - Study conclusions do not match the results as the long-term results were not reported. - Unclear how thematic analysis carried out.

Qualitative
Data collection approach:
Long term follow up questionnaire- qualitative questions about perceived utility and what they had learnt via telephone interview.

Data analysis:
Unclear how data analysed.

The systematic review identified 14 studies of whom four were qualitative, nine were quantitative and two were mixed methods. This section will first provide a description of the studies, then answer the research question and provide details of how training evaluation theory has been used in the studies before finally delineating the quality appraisal of the included studies.

Results Part 1: Description of the Studies

Fifteen studies met the PICO criteria. This section describes the studies in terms of how they were reported: why training was used, who took part, how people were recruited and what training was implemented (‘participants’ and ‘intervention’ of PICO criteria).

Participants

All studies’ participants were defined as family caregivers. In studies where these were described they included parents (2, 3, 6, 9, 10, 14, 15), spouses/ partners (2, 3, 5, 6, 9, 10, 14, 15), siblings (3, 6, 10), adult children (3, 6, 10) and friends who people with TBI lived with (2, 10). Seven studies did not delineate the definition of family caregiver (1, 4, 7, 8, 11, 12, 13). The most commonly attending caregivers were parents (28%-81% of sample; mean=49.14, SD= 10.16) and spouses/ partners (19%- 100% of sample, mean= 47.63, SD= 25.42). Interestingly, no studies detailed the financial arrangements surrounding the family (such as if they were paid to be caregivers) but it was assumed these samples were informal caregivers as there was no evidence to the contrary.

Recruitment

Nine were conducted in the United States of America (2, 4, 5, 6, 11, 12, 13, 14, 15), two in the United Kingdom (1, 8) and one in the Republic of Ireland (3), Hong Kong (7), Japan (9) and Australia (10), the majority of the research is therefore from the USA.

The majority of studies recruited through healthcare organisations (e.g. rehabilitation centres; 1, 2, 3, 4, 5, 6, 8, 12, 15), three recruited from BI specialist charities e.g. Headstart in Australia; 14, 10, 11), one was through referral from the Unites Stated department of veteran affairs (13) and one was via advertising to various agencies including healthcare and the newspaper (7).

Interventions

Training interventions evaluated in the fifteen studies identified by this review were organised around 16 common themes which were: generic effects of BI, cognition, recovery and self-care, emotions, communication, emotions and associated behaviour, physical, problem solving, community resources, goal setting, finances, medical advice/ psychiatry, psychosocial, children and relationships.

Results Part 2: How Has Informal Carer Training in TBI been Evaluated?

This section will answer the research question of ‘How has informal carer training in TBI been evaluated?’ by exploring, in detail, the methodologies employed, finally highlighting area of strengths and weaknesses in terms of methodology/ methods used for evaluation (i.e. the ‘Comparators’ and ‘Outcomes’ of the PICOs). No studies reported considering any theories or models of evaluation of training when planning the training evaluation. The NWKM (Kirkpatrick & Kirkpatrick, 2016) has been utilised to help delineate areas of focus of the training in each study.

Evaluative Methods used in Quantitative designs

Amongst the quantitative design studies, three studies were waiting list-controlled (2,3,5), two studies with cohort design with only pre and post measures (1, 4), three studies with cohort design, pre post and 3-months follow up (6, 7, 8), and one study with cohort design, pre post, three and six months follow up (9).

Types of Outcome Measures.

For cross study comparison, the qualitative outcome measures will describe both the quantitative and mixed methods evaluation.

Five studies used unstandardised measures (1, 4, 7, 14, 15), four used Likert scales (1, 4, 14, 15), one used a quiz to test knowledge (4) about BI and one is unknown (7). These measurements are not comparable across studies as they evaluated different concepts. Unstandardised measures were used to measure knowledge of BI, learning from the intervention attitude to BI, self-efficacy, goal attainment, helpfulness, training satisfaction, burden/ stress and finally level of support received (substantial systems and emotional support).

Twenty-two different standardised tests were used across the fifteen studies (1-9, 15) which aimed to review different outcomes of the studies. The standardised measures were used to measure carer strain, perceived criticism, family needs, service obstacles, family functioning, psychological symptoms, life satisfaction, empowerment, coping strategies, self-esteem, problems resulting from TBI. Only three standardised measures were used between different studies: The Hospital anxiety and depression scale (HADS; Zigmond & Snaith, 1983; 3, 8), The Family Needs Questionnaire (FNQ; Murray et al., 2006; 2, 6) and The Service Obstacles Scale (SOS; Marwitz, & Kreutzer, 1996; 2, 6).

All quantitative studies utilised statistical analysis (see tables 3,4 and 5) and reported improvements in some areas for caregivers (1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 15). The results overall show some improvements in some areas of evaluation however these should be considered in terms of the small sample sizes and subsequent rigour of any subsequent statistical analyses, as discussed in the quality section below.

Strengths in the Evaluation Approach of the Quantitative Studies.

A strength of the majority of the quantitative studies is their methods of evaluation were appropriate to meet the aims of the studies as they accurately measured the aims e.g. pre and post evaluation of caregiver burden using standardised measures. We can conclude from the findings that some studies showed positives of training, particularly in relation to increased satisfaction and accessibility to services, improved knowledge of TBI and improvement in some aspects of mental health including anxiety and depression.

Limitations in the Evaluation Approach of the Quantitative Studies.

As few standardised measures were used across studies it is difficult to compare results across the studies so drawing conclusions about the efficacy of TBI training for caregivers is difficult, findings should therefore be considered tentatively. Whilst the service obstacle scale was used to measure caregivers’ views on accessibility of local services, one step further was not taken to see from a service perspective if caregiver behaviour had changed in any way, for example if there was a change in frequency of accessing services. In considering the NWKM, the training outcomes largely focussed on participants reaction to the training and learning; behaviour change and how the results of the study impacted the services were not included, information about processes which affected participation/ engagement were also not included. In terms of statistical significance only two studies reported power calculations (3, 8) and one effect sizes (3) which is explored further in the quality appraisal section below. Of the nine studies only four provided longer term follow up and these were relatively short (three months) with only one study with follow up at six months, therefore longer-term effects are unknown.

Evaluative Methods Used in Qualitative Designs

Described qualitative results include results from qualitative papers and qualitative results from mixed methods papers. Six studies used qualitative methodology.

Amongst the qualitative design studies two studies used focus groups (10, 13), two studies used individual interviews (11, 15), two used written feedback questionnaires (12, 14). To analyse the data, one study utilised thematic analysis (10), one study appeared to use a brief thematic analysis by counting themes (15), two studies used content analysis (11, 13), one study used Modified Grounded Theory inductive data analysis (14) and in one study it is unknown how the data were analysed as it was not described in the written report (12).

Strengths in the Evaluation Approach of the Qualitative Studies.

The qualitative studies' results provide detailed insight into the process of the training and the emotional aspects of training. Specifically, the qualitative analysis provided information about the interaction between the training and change in behaviour and emotions for example in study 13 a theme was 'Restoring relationships through communication and understanding' which detailed the changes that had been made because of the intervention and why. Such mechanisms of change may be difficult to capture with quantitative methodologies which is a strength of the qualitative methodologies. In considering the NWKM, the training evaluation focussed on participants reaction to the training, what was learnt, what impacted any change in feelings or behaviour and factors which affected participation/ engagement. Information about how the study could impact the services delivered to caregivers was not included.

Limitations in the Evaluation Approach of the Qualitative Studies.

There was variable reporting of how data were collected and analysed in the qualitative studies, raising queries about credibility of results (see quality appraisal below). Only two studies reported anything about epistemological or ontological stances (10, 11) and only one study considered the positionality of the researcher in the analysis (11). The majority of studies therefore fail to reflect on the philosophical framework adopted or how the researchers' positionality impacts the collection and analysis of results.

Evaluative Methods Used in Mixed Methods Designs

Mixed methods designs utilised were embedded (15) and triangulation (14). Both Mixed methods studies utilised quantitative pre- and post-measures. One study utilised qualitative component for after every session (14) and one for post and follow up (15).

Strengths in the Evaluation Approach of the Mixed Methods Studies.

Both studies (14, 15) qualitative results consider what participants found helpful about the group and both studies participants report on follow up that the resources have been used in day-to-day life indicating the group resources were useful. Both studies had good integration of methodological components and compared the results across methods leading to a more in depth understanding of participants responses. The studies look at different levels of training evaluation (Kirkpatrick & Kirkpatrick, 2015) specifically reaction to the training, learning and behaviour.

Limitations in the Evaluation Approach of the Mixed Methods Studies.

Training evaluation researchers have advocated for a focus on the factors which influence the process of training and how this process influences outcomes (Kirkpatrick & Kirkpatrick, 2015, Shufflebeam & Webster, 1988). A strength of mixed methods designs is that it enabled both outcomes and processes to be explored in the studies (Palinkas et al., 2011). The qualitative methodology however for the mixed methods papers failed to explore processes that impacted participants learning or change in emotions/ behaviour.

Results Part 3: Quality Appraisal and Appraisal of Evaluations

Quantitative studies appraised using the QATAS revealed a range of biases in the studies, for detailed breakdown see appendix D. One study received a rating of ‘strong’ (2), two ‘moderate’ (5, 8) and eight ‘weak’ (1, 3, 4, 6, 7, 9, 14, 15). Common weaknesses in the quantitative research were selection bias (rated weak in 1, 5, 6, 7, 9, 15) and blinding (rated weak 1, 3, 4, 6, 7, 8, 9, 14, 15). Poor scores in blinding reflects a lack of randomised controlled trials. Strengths included details of confounders (2, 3, 5, 6, 7, 8, 14) and methods of data collection (2,3, 5, 6, 7, 8, 9). In terms of statistical significance only two studies reported power calculations (3, 8) and one effect sizes (3). Study 8 reported that a sample of 120+ was needed for statistical significance and their sample was 50, indicating a lack of power. Study 2 reports power calculation and a sample size of adequate power with effect sizes small and moderate. In terms of how confident we can be overall of the quality of the study designs and the reliability of the statistical analysis the overall quantitative literature is weak.

Of the qualitative studies appraised using the CASP, one was rated as ‘strong’ (11), four as ‘moderate’ (10, 13, 14, 15) and one as ‘weak’ (12) quality; the majority of studies were therefore rated as moderate in terms of rigour, for detailed breakdown see appendix D. Common weaknesses identified were a lack of consideration of ethics and epistemological approaches. One study (12) was difficult to synthesise due to the poor reporting of the method and results. Three studies (10, 11, 13) had clear descriptions of the qualitative methods of enquiry and analysis used whereas the other three studies (12, 14, 15) lacked credibility due to a lack of statement of aims, a lack of transparency in the methods for collecting and analysing data. Looking across the data therefore the qualitative methodologies overall yielded trustworthy results.

Of the mixed method studies, both were rated as ‘weak’ for the quantitative write up, study 15 also rated as weak with qualitative findings and study 14 rated as moderate. Neither study provided a rationale for using mixed methods design. The specific difficulties for each paper were the lack of clarity around the results and how they were obtained, for example in study 15 it is unclear how quantitative data was collected and in study 14 it is unclear how the qualitative data was collected. Study 15 reports using thematic analysis, but it is not described how this analysis was done or by whom. Neither the qualitative or quantitative components of the studies examined adhere to the quality criteria of either quantitative or qualitative methodologies. Overall, the reporting of the mixed methods studies can therefore be considered as weak in terms of quality.

Overall, mixed methods studies were most likely to be rated as ‘weak’ in terms of quality, only two studies rated as strong, one purely qualitative and one purely quantitative. The strong quantitative study (Bushnik et al., 2015) utilised a randomised control trial design and reported all aspects of the evaluation with no areas rated as ‘weak’. The strong qualitative study (Donnelley et al., 2020) also had exceedingly detailed reporting of their evaluative methodology including detailed description of aims, methodology employed, data collection and analysis and findings. This detailed reporting lends weight to their evaluation findings as the reader can understand the process of the methods employed. The weaker studies failed to provide the detail needed to evaluate rigour or reliability of findings for example Lauer-Listhaus, (1991) failed to provide aims of the evaluation, data analysis and subsequent findings were not clearly described, making understanding the purpose and results of the study difficult, and therefore the impact of the training. Qualitative only research rated more highly in terms of quality. This indicates that the overall quality of the research in the area is lacking, and increased rigour is needed for future studies including increased clarity around aims, how data collection and analysis is reported and increased sample sizes for studies using statistical analysis.

Discussion

The current study aimed to ascertain how training for informal caregivers about TBI has been evaluated in the existing literature and what training evaluation theory has been considered in designing the evaluation. It aimed to answer the research question: How has informal carer training in TBI been evaluated?

The research question is answered in section 2 of the results which details how informal carer training in TBI has been evaluated in the existing literature. Nine studies used quantitative methods of evaluation, four used qualitative methods and two used mixed methods. Quantitative papers utilised standarsised and unstandardized pre and post measures. All studies utilised cohort designs, only three were waiting list controlled and four used longer term follow up (three or six months). To analyse the data, statistical analysis was used in all quantitative papers however results should be considered with caution due to the low sample sizes in most papers, lack of reporting of power and effect size with only one paper reporting adequate power with effect sizes small and moderate (Bushnik et al., 2015). Indeed, Bushnik et al., (2015; study 2) was the only paper rated as ‘strong’ from the quantitative papers and therefore more weight should be given to this paper’s findings. Randomised controlled trials are considered gold standard for evaluating the effectiveness of interventions (Akobeng, 2005); Bushnik et al., (2015) utilised randomised controlled trial methodology, had a relatively large number of participants, reports power and effect size and had a three month follow up.

Qualitative papers utilised focus groups, individual interviews, written feedback questionnaires to collect the data. The qualitative studies’ results provide detailed insight into the process of the training and the emotional aspects of training. Specifically, the qualitative analysis provided information about the interaction between the training and change in behaviour and emotions. Overall, the qualitative studies were rated higher in terms of quality than the quantitative papers with only one paper classified as ‘weak’ in terms of quality appraisal, however only one paper was classified as ‘strong’; this implies that, overall, more weight could be given to the qualitative papers than quantitative papers. Good practice highlighted from Donnelley et al (2020) paper rated ‘strong’ was authors clearly described the philosophical frameworks used, the analytical methodology, the researchers’ positionality and overall provided a rigorous description of the methods used, aiding reader trust and rigour.

The current review identified the mixed methods papers both utilised quantitative pre- and post-measures, one study utilised qualitative component for after every session and one for post and follow up. In both papers the qualitative results consider what participants found helpful about the group. A strength of mixed methods design is that it enabled both outcomes and processes to be explored in the studies, such as the one study which used qualitative methodology to explore the longer term follow up (Palinkas et al., 2011).

Longer follow ups in training evaluation can help researchers understand how learning translates into changes in behaviour, cognitions and emotions over time and impacts individuals and organisations (Ford et al., 2018). The majority of the papers (66%) lacked longer term follow up with the longest follow up being 6 months reported by only one paper. Blume et al., (2019) suggested the impact of training can evolve over time due to an interaction between the training, the individual and their personal context, the review found this was not considered which could be due to the lack of consideration of training evaluation theory.

Overall, the analysis identified several limitations in the reporting of the studies about TBI training for caregivers (e.g. lack of stated aims of the studies, lack of descriptions of data collection methods used in mixed methods studies) and the studies themselves (e.g. lack of effect size reporting or power calculations in quantitative studies, lack of consideration of epistemological approaches). Quality appraisal identified overall the reporting of the studies was rated as ‘weak’ or ‘moderate’ with only two papers being rated ‘strong’. More importantly the appraisal tools helped to further our understanding of the evaluation and reporting of evaluation in the literature by specifically highlighting the importance of both methodological rigour and clarity in reporting of results to ensure it is clear to the reader *how* trainings are evaluated, for example explaining how the data was collected and evaluated. The study identified that no papers considered theories of training evaluation (e.g. The NWKM; Kirkpatrick & Kirkpatrick, 2016) when planning studies which evaluated TBI training. Therefore, some of the flaws in the existing research could be understood by a lack of theoretical grounding leading to unsuitable methods of data collection and evaluation, for example not considering organisational level outcomes (Fried, 2021; Kirkpatrick & Kirkpatrick, 2016).

Theoretical Implications

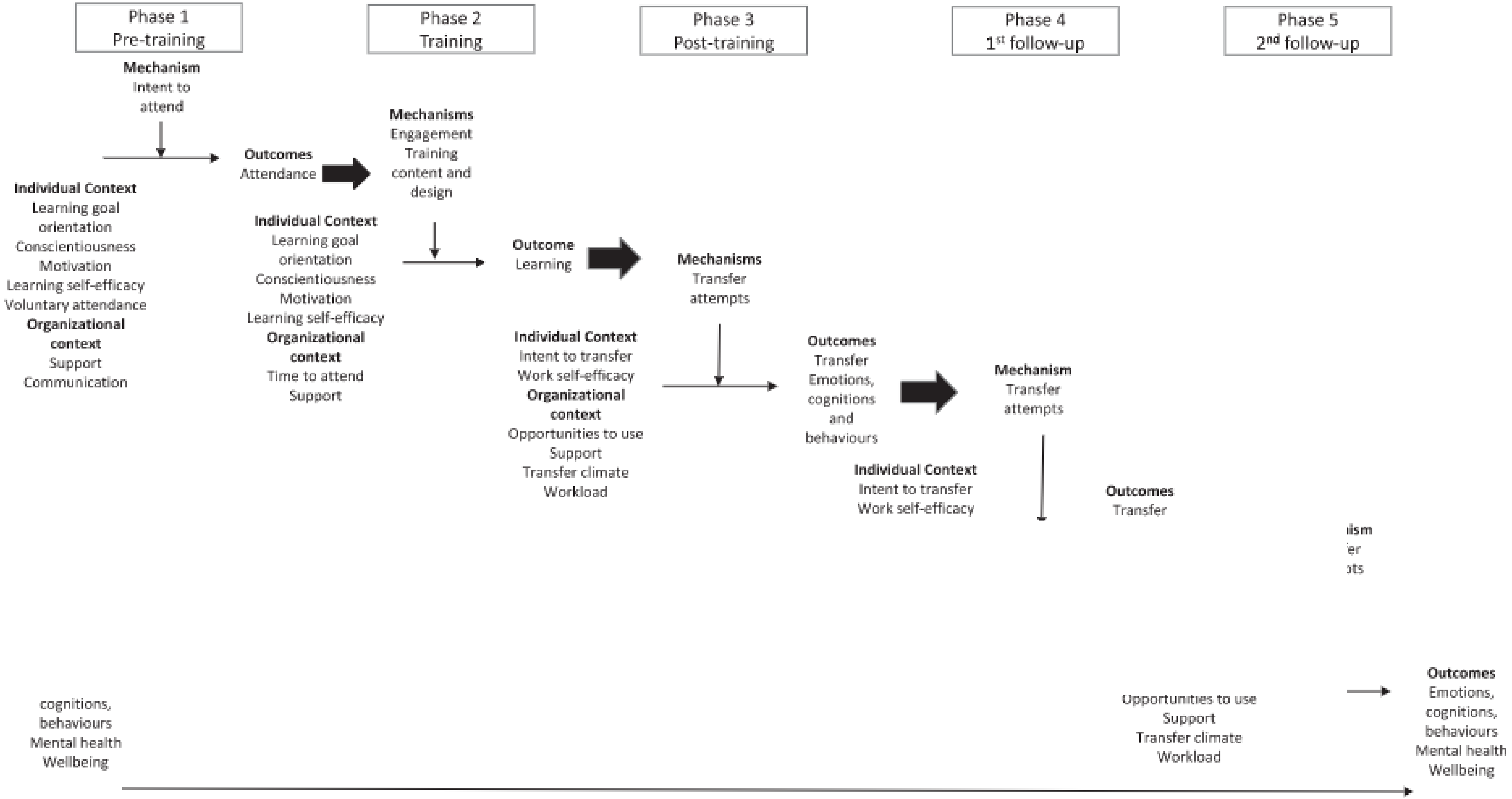
Existing models of evaluating training provide insight into the strengths and weaknesses of the evaluation of training caregivers with the existing literature base. The current review identified that no studies explored all four levels of the NWKM. Specifically, none evaluated level 4 which is how the training impacted at a service level, few explored behaviour change specifically related to the intervention and most studies focussed on the clients feelings about evaluation and what they learnt. Evaluation at a service level is important to consider as Kreuser et al (2009) note in their study that service pressures are impacting patient journeys through the system and therefore impacting caregivers due to, for example, early discharges. This results in increased burden on caregivers to provide rehabilitation, caregiver training could therefore be important to prevent readmission of patients with TBI which would impact at a service level (Hisa et al., 2018). Evaluating studies at different levels can therefore provide essential information about 1) the impact of any interventions on caregivers to see if this is worthy of continuing to put resources into these interventions, 2) showcase the benefits of the interventions to individuals and organisations and, 3) to provide information about best practice for other clinicians (Shun et al, 2021; Institute for Innovation and Improvement, 2005).

A criticism of the NWKM revealed by this study in terms of its use for evaluating caregiver training is it is difficult to fit mental health related outcome measures (such as burden, stress) into the model, as they are not measurable changes in behaviour; measurable aspects of mental health may be influenced by and influence behaviour (e.g. low mood; Lejuez et al., 2001). The majority of the quantitative studies explored mental health outcomes. The NWKM can be further criticised in light of the current studies' results as it focusses on *what* was learned rather than *why* was it either learnt or not learnt (Dubrowski & Morin, 2011). The model lacks a focus on process of change thus lacking insight into the underlying mechanisms which facilitate or inhibit the achievement of programme outcomes (Gandomkar, 2018). The solution to this may be found in the literature about *training transfer*, the degree to which knowledge or skills acquired during training are translated into changes to behaviours, cognitions and emotions that are maintained over time (Baldwin & Ford, 1988).

Nielsen and Shepherd (2022) recently proposed the Integrated Training Transfer and Effectiveness Model (ITTEM, see figure 2 below) to capture the intricacies of the mechanisms of change when evaluating training which impacts individuals' mental health. The findings of this review support the premise of Nielsen and Shepherd's attempt to combine Ford et al (2018) recommendations for considering factors influencing both training transfer and training evaluation. Further, it aims to collect data about these factors over the long term to ensure the training evolves over time to meet the needs of caregivers. Specifically, the model gives a structured way for clinicians/ researchers to consider training transfer and evaluation from the early stages of intervention planning, this could help shape goals of training, aims of research, therefore guiding *what* needs to be evaluated and *how* this is evaluated to capture the relevant data for analysis.

Figure 2.

The Integrated Training Transfer and Effectiveness Model (ITTEM; Nielsen & Shepherd, 2022, p. 6)



Clinical Implications

The current review identified methodological problems with the research and the majority was classified as ‘weak’, indicating clinicians need to be cautious when applying the results to their practice. Clinicians could utilise the ITTEM model (Nielson & Shepherd, 2022) to 1) clarify what clinical need needs to be met by the training, 2) ascertain what intervention is needed specifically to meet this need, 3) determine evaluation strategies that measure not only target outcomes but influencing factors and 4) uncover what is needed to provide evidence of sustainability of training provision to help secure resources. As this model is relatively new, future research could explore its utility in evaluating TBI training interventions for caregivers to explore if the model is useful in this context. The results highlight the importance of having clinicians with good research skills in the clinical teams when developing the evaluation for studies (such as clinical psychologists), and/or partnerships with researchers with more expertise in studying intervention outcomes (Baumbusch, 2008). Dissemination of such findings could further develop rigorous practice-based evidence, linked with evidencing effective care provision which is in line with Care Quality Commission (2022) best practice, and could provide further direction for future research.

Future Research

The quality of the intervention studies was overall considered to be ‘weak’ or ‘moderate’ with only two papers being rated ‘strong’ in terms of what was reported to have been done in terms of methodology. It may be that some aspects identified as being weak e.g. lack of consideration of ethics, was done by researchers but was not reported, therefore methodological weaknesses may in fact be reporting weaknesses. Future research should therefore carefully detail methods used in data collection and analysis to provide evidence of rigorous research methodology. No studies reviewed how change in knowledge could have mediated change in the other variables assessed, such as change in behaviour or emotions for caregivers. For example, the two caregiver studies which measured anxiety and depression using the HADS (Zigmond & Snaith, 1983) found no change in emotional distress, however they did not measure whether any behaviour had changed which might have influenced mood, for example changing their communication with the person with TBI (Xu et al., 2020; Zabihi, et al., 2020). Understanding factors involved in change is essential for developing targeted psychoeducation which is likely to be effective in changing targeted outcomes for caregivers (Carey et al., 2018). Future research could utilise the ITTEM model to clarify aims and consider appropriate evaluation throughout each stage of intervention planning and implementation to better understand the factors influencing change in behaviour and emotions in caregivers when receiving training about TBI. As demonstrated by the findings of this review, mixed methods designs could be utilised to effectively evaluate both training outcomes and factors influencing training transfer.

Review Limitations and Critical Appraisal

The term informal caregiver is a debated term within and across different countries/ cultures (Sadler and McKevitt, 2013). The current paper does not delineate the complex social, cultural, political, economic and environmental factors which influenced the caregivers in the reported studies, the primary reason for this is that information is not reported in the studies themselves. For the purpose of this review the definition of informal caregiver was left open and included all family and friend caregivers, no exclusions were applied in terms of if caregivers were reported as being paid (e.g. carers allowance in the UK) however no information like this was reported in any studies. The definition of caregiver were different for each study and how these roles are experienced between and within different countries may vary (Sadler and McKevitt, 2013). The findings from the current review should therefore be considered carefully in terms of transferability of the recommendations from the findings to other cultures; as the paper focusses on the process of the evaluation of training rather than the outcomes of the TBI training the principals may still be useful to consider cross-culturally.

Studies reported are predominantly from the USA and other ‘Western’ countries (Wilshire, 2021), except for two studies (Japan and Hong Kong). One reason for this may be that an inclusion criterion was for the study to be in English which can produce biased results in the inclusion of studies (Moher et al., 2003). The search strategy involved broad terms for caregivers which returned a high number of papers, as capturing variations of caregivers was important. This approach to the review was taken to limit the risk of missing key papers from fewer search terms. Due to feasibility and time limitations a small number of databases were thoughtfully targeted, because of this papers could potentially have been missed which could result in biased interpretations of the evidence base. Grey literature and non-English published literature were also not searched which could have impacted the findings due to publication bias (Hartling et al., 2017), these could be considered for inclusion in future reviews (Lefebvre et al., 2019). The risk of neglecting to identify relevant literature was mitigated against by checking the references and citations of all included papers which resulted in the identification of five further papers. One reviewer was used for all the screening. To mitigate against potential reviewer bias, six papers were checked by a second independent rater (as recommended by Moher et al., 2015). Cohen's Kappa was 1.0, indicating complete agreement between raters (McHugh, 2012).

Conclusions

This systematic review identified fifteen studies which evaluated different TBI training for informal caregivers of people with TBI. The analysis identified several limitations in the reporting of the studies about TBI training for caregivers (e.g. lack of stated aims of the studies, lack of descriptions of data collection methods used in mixed methods studies) and the studies themselves (e.g. lack of effect size reporting or power calculations in quantitative studies, lack of consideration of epistemological approaches). Quality appraisal identified overall the reporting of the studies was rated as 'weak' or 'moderate' with only two papers being rated 'strong'. Appraisal tools identified that the write up of the methods employed sometimes lacked rigour and clarity implying consideration needs to be given to the trustworthiness or reliability of the findings of the studies. Furthermore, no studies considered training evaluation theory when evaluating the training for caregivers of people with TBI. Theoretical implications of the study identified the use of training evaluation theory such as the ITTEM model (Nielsen & Shepherd, 2022) could help address these identified flaws for future research as it enables thorough consideration of aims in line with service and caregiver needs, more it highlights the need to consider both training transference and outcomes which can help guide appropriate evaluation methods.

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Appendix A

PRISMA checklist (Moher et al., 2009)

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	10
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	10
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	11--15
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	15
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	N.A
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	16
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	17
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	18
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	19
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	19
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	N.A
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	19
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	19
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	N.A

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	59
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N.A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	21
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	23-39
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	23-39
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	23-39
Synthesis of results	21	Present the main results of the review. If meta-analyses are done, include for each, confidence intervals and measures of consistency	40-48
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	46
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N.A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	48-51
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	56
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	58
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	N.A.

Appendix B

Critical Appraisal Skills Programme (CASP) Checklist

CASP
Critical Appraisal
Skills Programme

www.casp-uk.net
info@casp-uk.net
Summertown Pavilion, Middle
Way Oxford OX2 7LG

CASP Checklist: 10 questions to help you make sense of a **Qualitative** research

How to use this appraisal tool: Three broad issues need to be considered when appraising a qualitative study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Qualitative) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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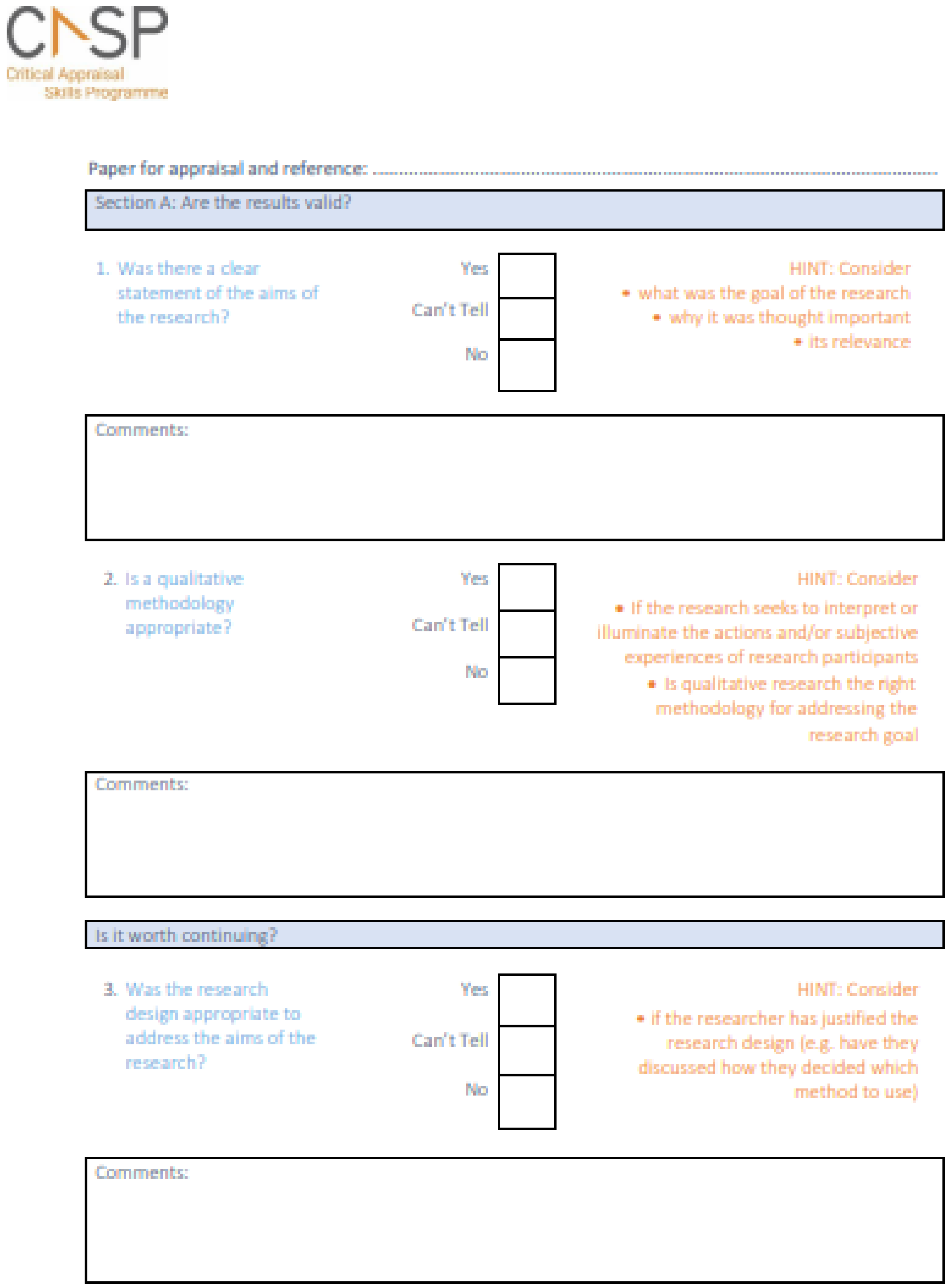
Critical Appraisal Skills Programme (CASP) part of Oxford Centre for Triple Value Healthcare Ltd www.casp-uk.net



CASP
Critical Appraisal
Skills Programme

Paper for appraisal and reference: ....

Section A: Are the results valid?

1. Was there a clear statement of the aims of the research?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- what was the goal of the research
- why it was thought important
- its relevance

Comments:

2. Is a qualitative methodology appropriate?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants
- Is qualitative research the right methodology for addressing the research goal

Comments:

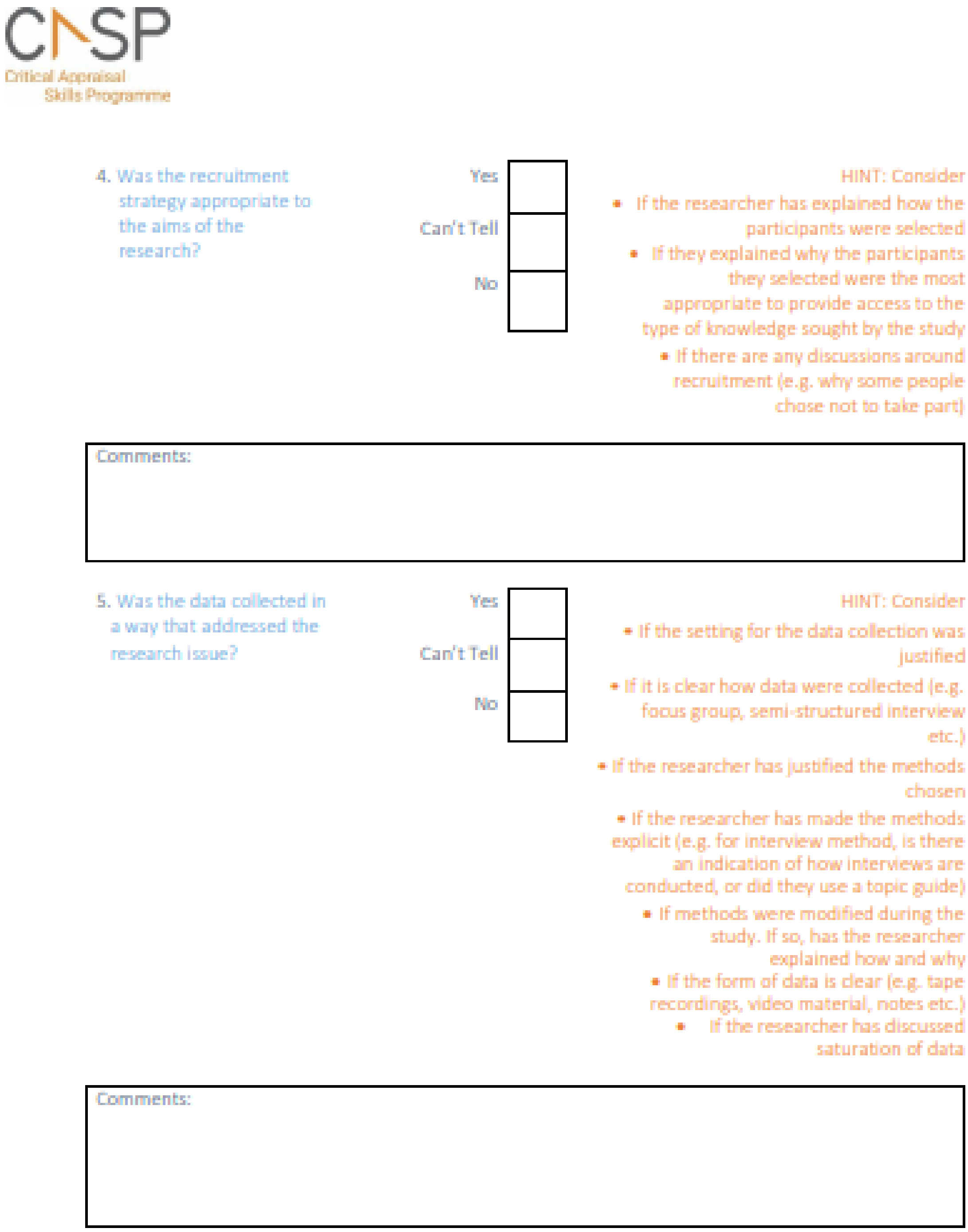
Is it worth continuing?

3. Was the research design appropriate to address the aims of the research?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- if the researcher has justified the research design (e.g. have they discussed how they decided which method to use)

Comments:



CASP
Critical Appraisal
Skills Programme

4. Was the recruitment strategy appropriate to the aims of the research?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If the researcher has explained how the participants were selected
- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- If there are any discussions around recruitment (e.g. why some people chose not to take part)

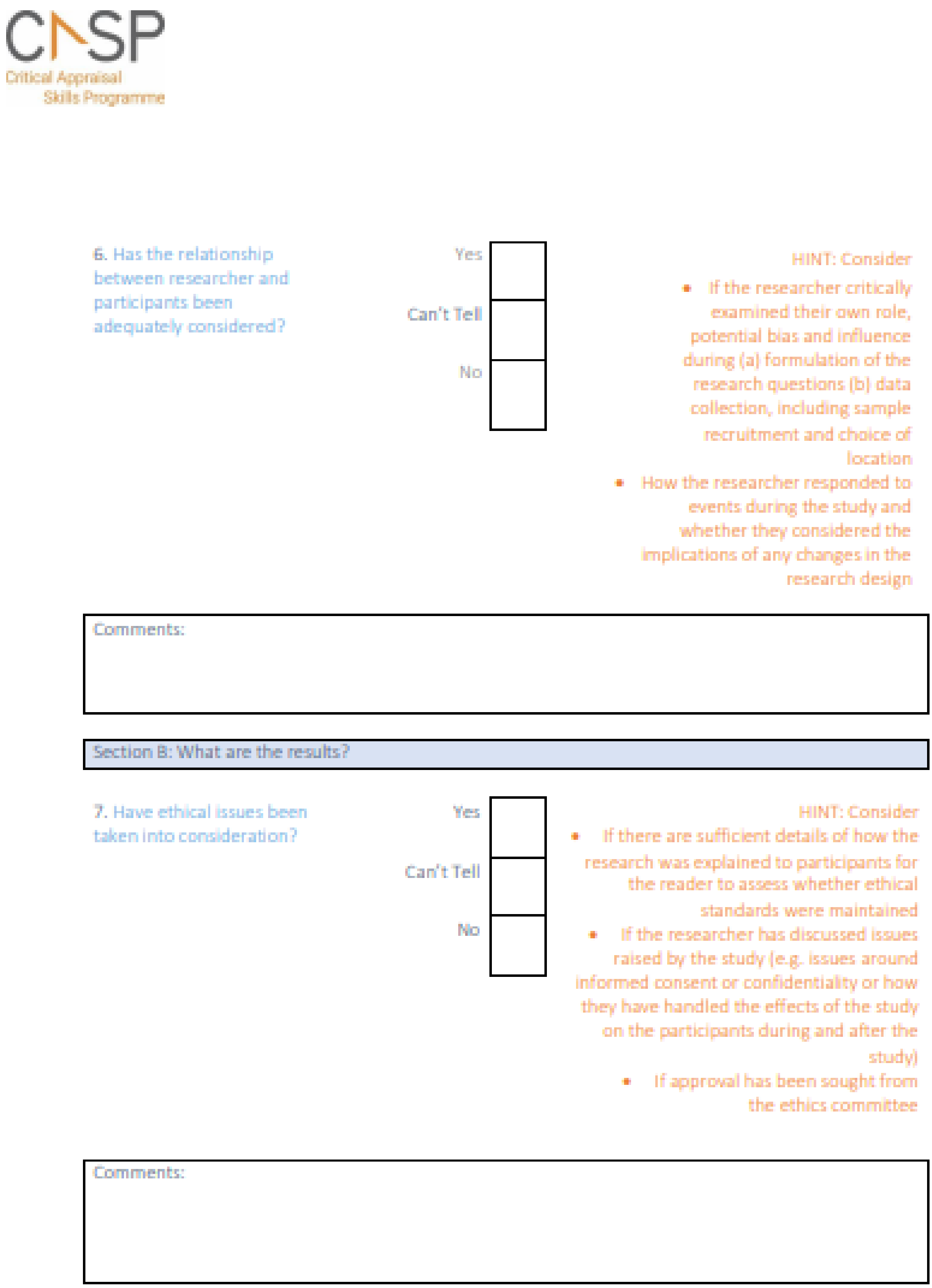
Comments:

5. Was the data collected in a way that addressed the research issue?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If the setting for the data collection was justified
- If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews are conducted, or did they use a topic guide)
- If methods were modified during the study. If so, has the researcher explained how and why
- If the form of data is clear (e.g. tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

Comments:



CASP
Critical Appraisal
Skills Programme

6. Has the relationship between researcher and participants been adequately considered?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

Comments:

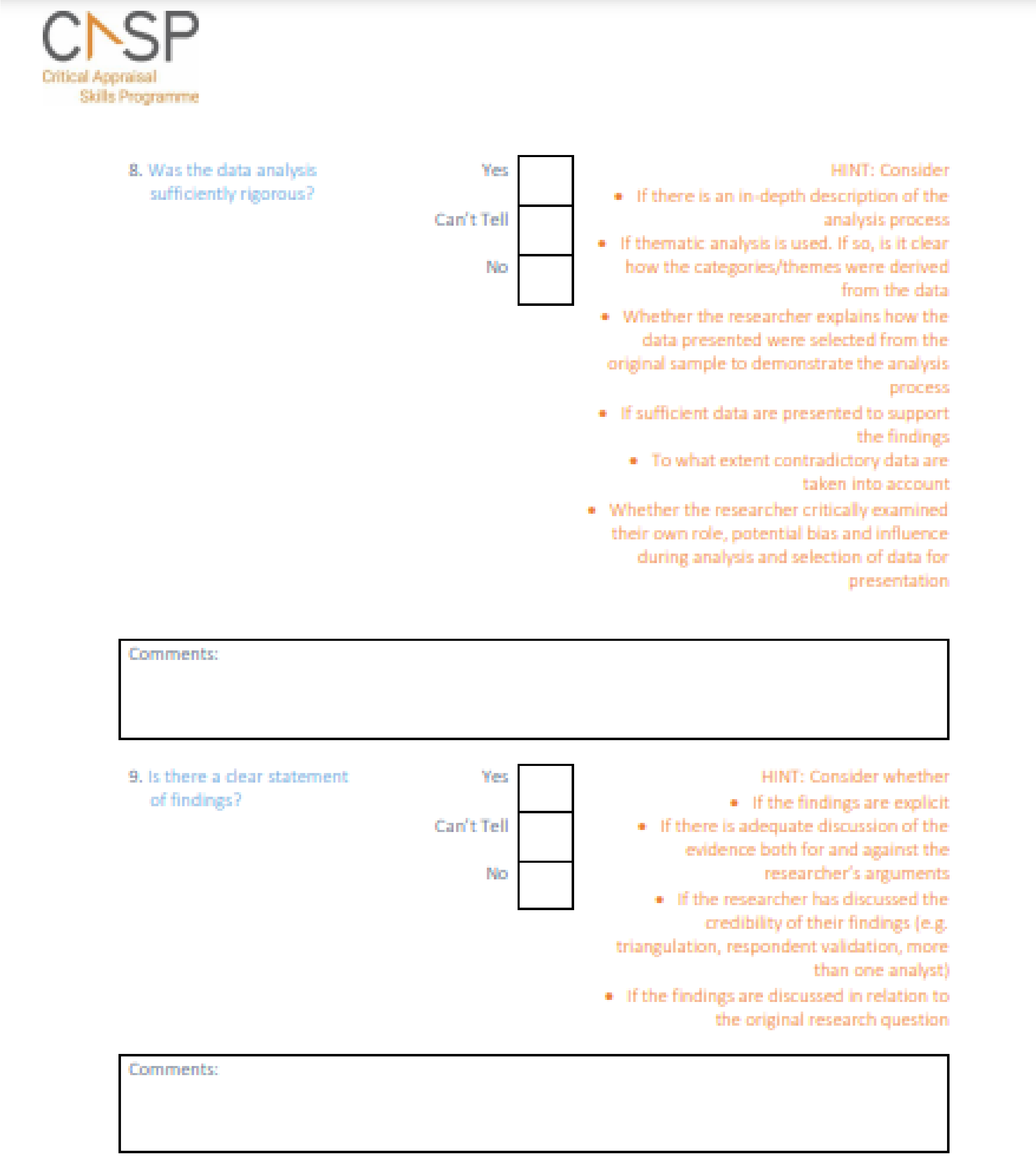
Section B: What are the results?

7. Have ethical issues been taken into consideration?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

Comments:



CASP
Critical Appraisal
Skills Programme

8. Was the data analysis sufficiently rigorous?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

Comments:

9. Is there a clear statement of findings?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researcher's arguments
- If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)
- If the findings are discussed in relation to the original research question

Comments:

CASP
Critical Appraisal
Skills Programme

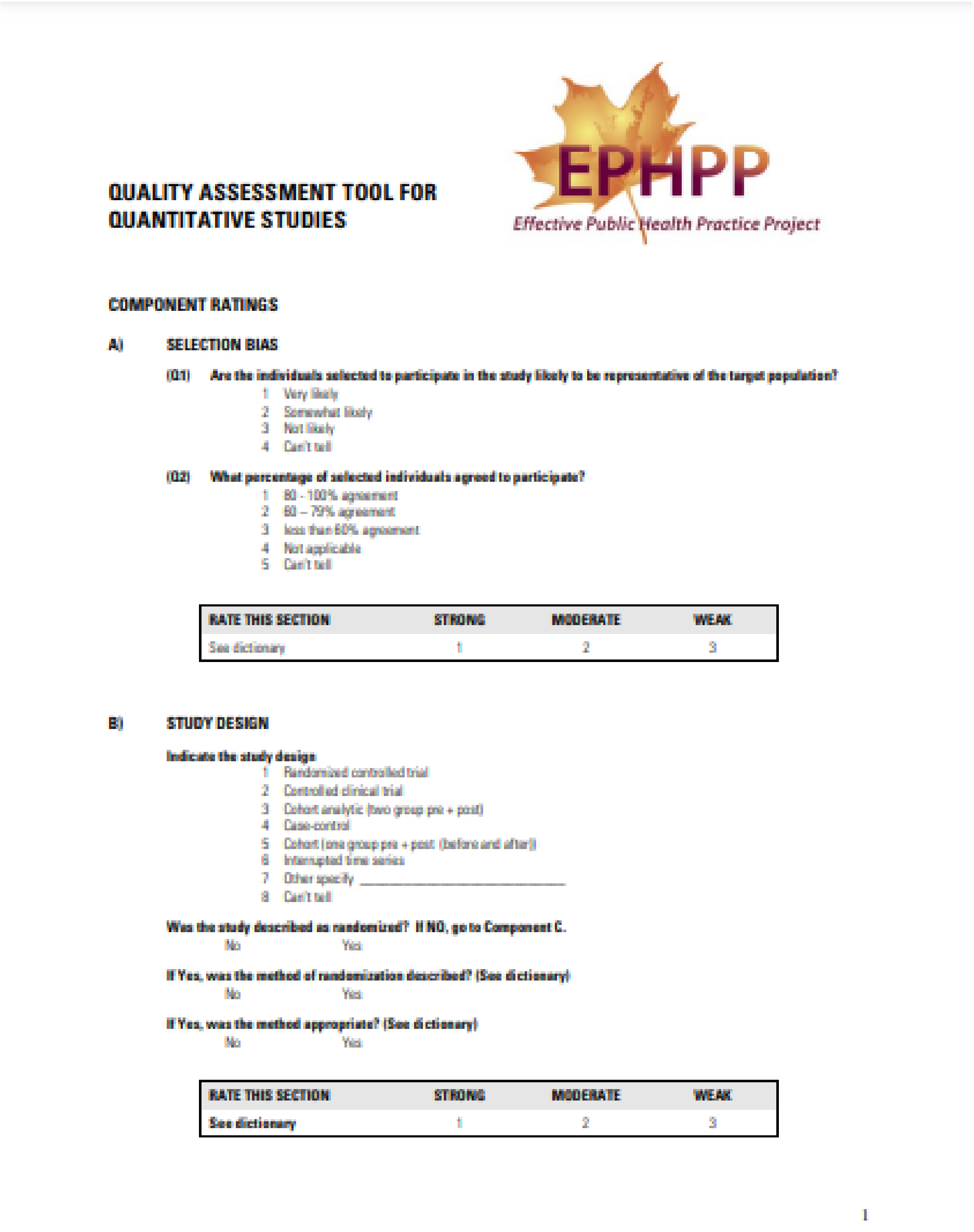
Section C: Will the results help locally?

10. How valuable is the research?	HINT: Consider • If the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature • If they identify new areas where research is necessary • If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used

Comments:

Appendix C

Qualitative Assessment Tool for Quantitative Studies (QATAS)



QUALITY ASSESSMENT TOOL FOR QUANTITATIVE STUDIES

EPHPP
Effective Public Health Practice Project

COMPONENT RATINGS

A) SELECTION BIAS

(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?
1 Very likely
2 Somewhat likely
3 Not likely
4 Can't tell

(Q2) What percentage of selected individuals agreed to participate?
1 80 - 100% agreement
2 60 – 79% agreement
3 less than 60% agreement
4 Not applicable
5 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

B) STUDY DESIGN

Indicate the study design
1 Randomized controlled trial
2 Controlled clinical trial
3 Cohort analytic (two group pre + post)
4 Case-control
5 Cohort (one group pre + post (before and after))
6 Interrupted time series
7 Other specify ____________________
8 Can't tell

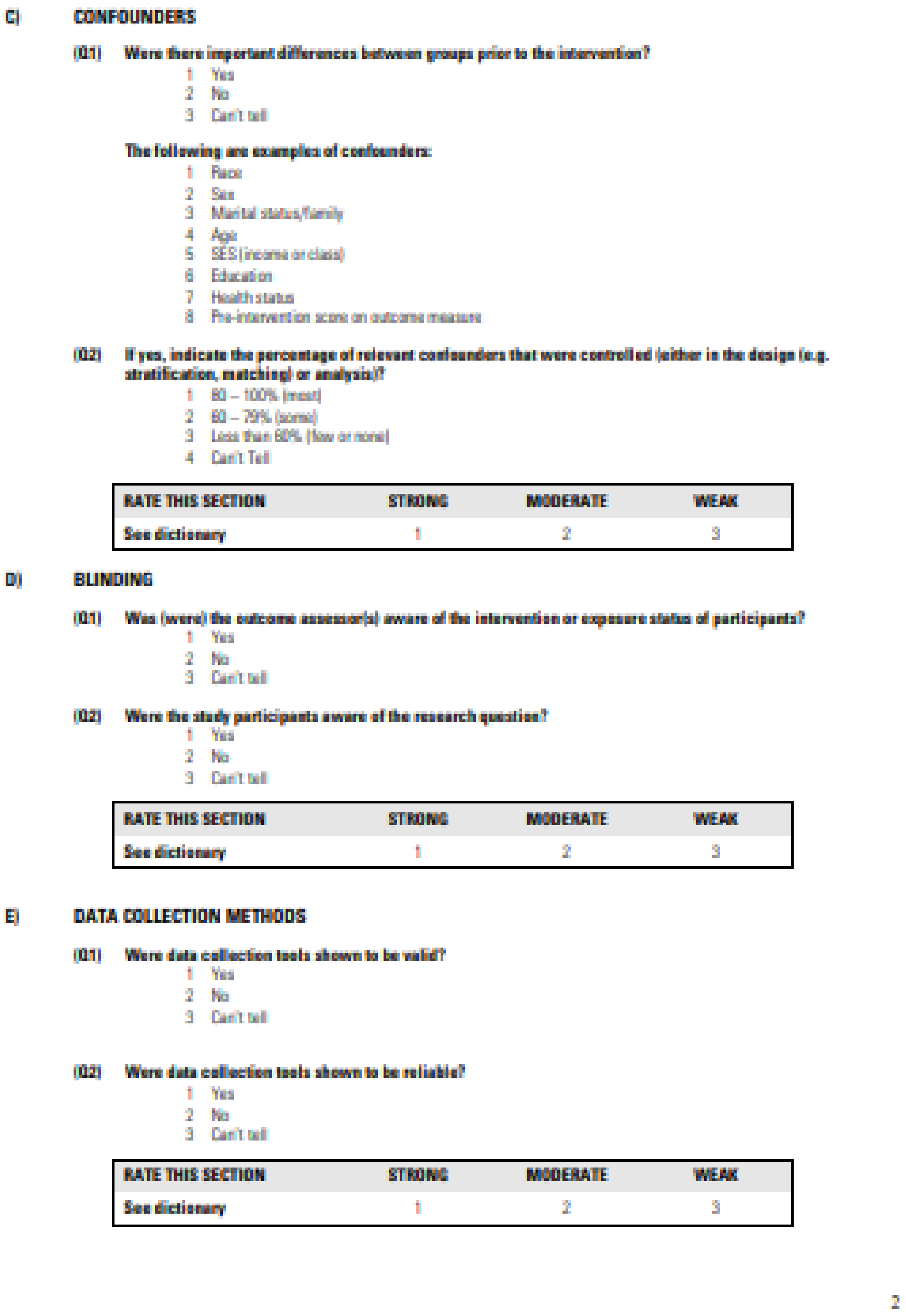
Was the study described as randomized? If NO, go to Component C.
No Yes

If Yes, was the method of randomization described? (See dictionary)
No Yes

If Yes, was the method appropriate? (See dictionary)
No Yes

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

1



C) CONFOUNDERS

(Q1) Were there important differences between groups prior to the intervention?
1 Yes
2 No
3 Can't tell

The following are examples of confounders:
1 Race
2 Sex
3 Marital status/family
4 Age
5 SES (income or class)
6 Education
7 Health status
8 Pre-intervention score on outcome measure

(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?
1 80 – 100% (most)
2 60 – 79% (some)
3 Less than 60% (few or none)
4 Can't Tell

RATE THIS SECTION	**STRONG**	**MODERATE**	**WEAK**
See dictionary	1	2	3

D) BLINDING

(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?
1 Yes
2 No
3 Can't tell

(Q2) Were the study participants aware of the research question?
1 Yes
2 No
3 Can't tell

RATE THIS SECTION	**STRONG**	**MODERATE**	**WEAK**
See dictionary	1	2	3

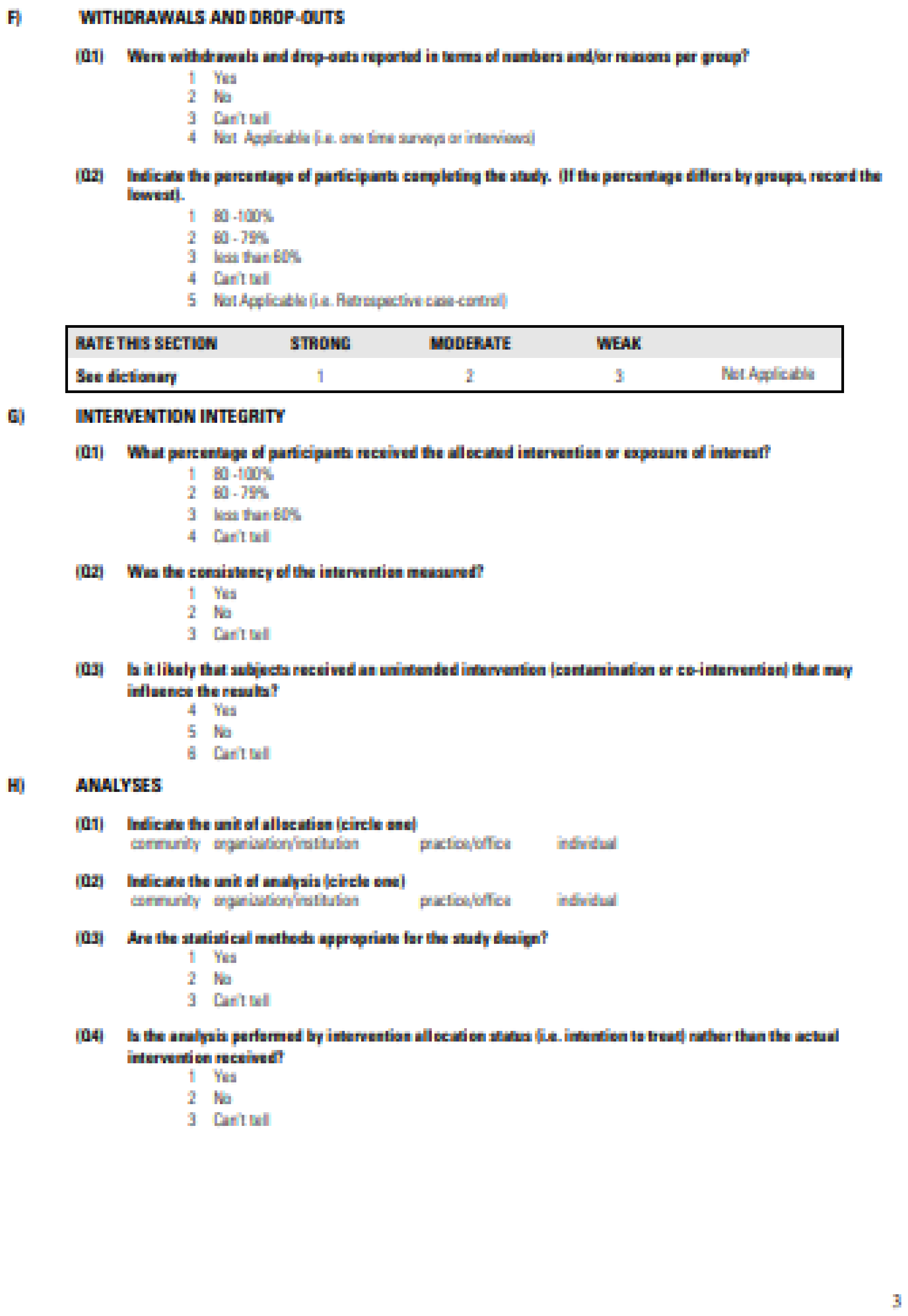
E) DATA COLLECTION METHODS

(Q1) Were data collection tools shown to be valid?
1 Yes
2 No
3 Can't tell

(Q2) Were data collection tools shown to be reliable?
1 Yes
2 No
3 Can't tell

RATE THIS SECTION	**STRONG**	**MODERATE**	**WEAK**
See dictionary	1	2	3

2



F) **WITHDRAWALS AND DROP-OUTS**

(Q1) **Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?**

1 Yes
2 No
3 Can't tell
4 Not Applicable (i.e. one time surveys or interviews)

(Q2) **Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).**

1 80 -100%
2 60 - 79%
3 less than 60%
4 Can't tell
5 Not Applicable (i.e. Retrospective case-control)

RATE THIS SECTION	STRONG	MODERATE	WEAK	
See dictionary	1	2	3	Not Applicable

G) **INTERVENTION INTEGRITY**

(Q1) **What percentage of participants received the allocated intervention or exposure of interest?**

1 80 -100%
2 60 - 79%
3 less than 60%
4 Can't tell

(Q2) **Was the consistency of the intervention measured?**

1 Yes
2 No
3 Can't tell

(Q3) **Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?**

4 Yes
5 No
6 Can't tell

H) **ANALYSES**

(Q1) **Indicate the unit of allocation (circle one)**

community organization/institution practice/office individual

(Q2) **Indicate the unit of analysis (circle one)**

community organization/institution practice/office individual

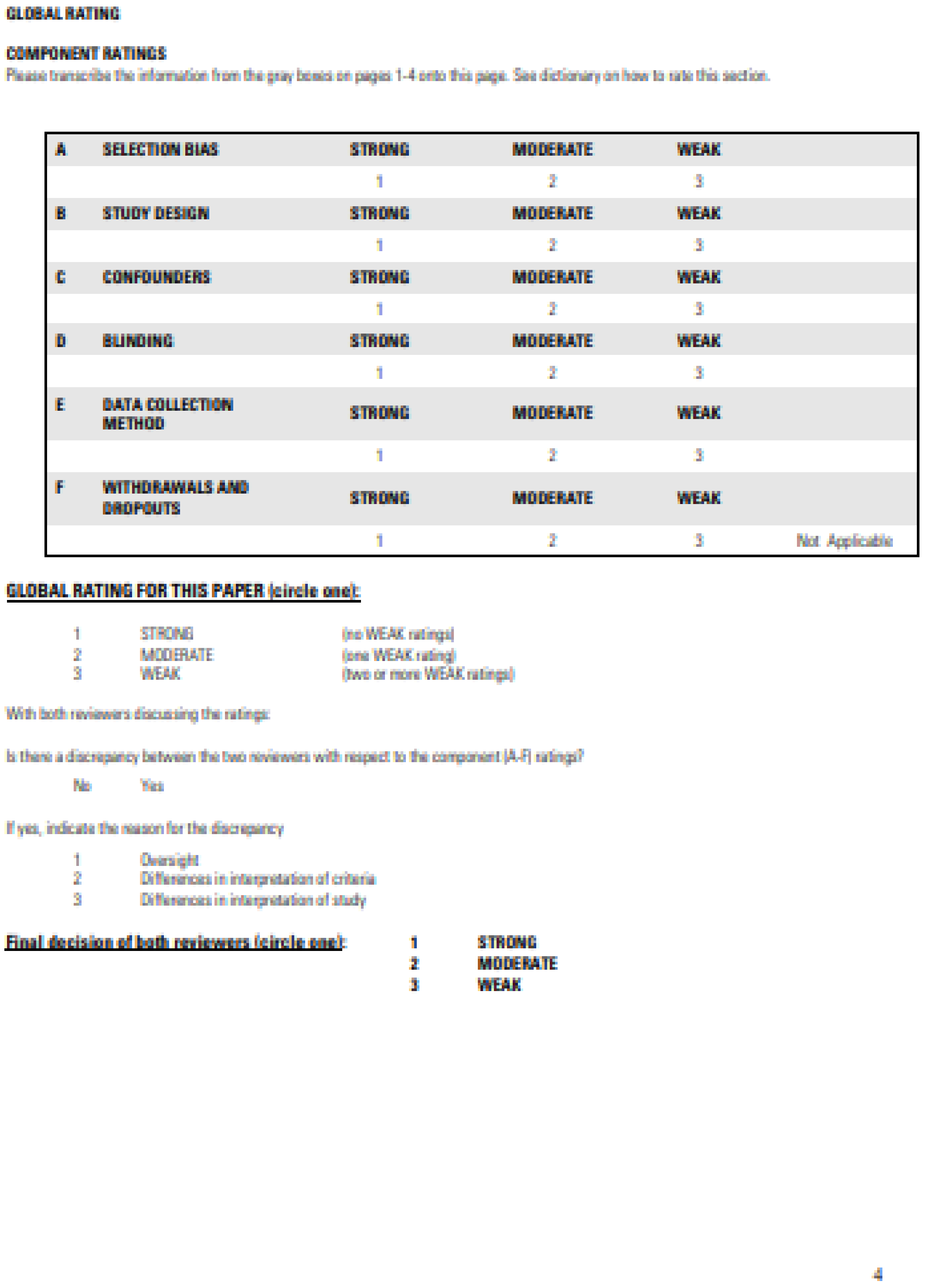
(Q3) **Are the statistical methods appropriate for the study design?**

1 Yes
2 No
3 Can't tell

(Q4) **Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?**

1 Yes
2 No
3 Can't tell

3



GLOBAL RATING

COMPONENT RATINGS

Please transcribe the information from the gray boxes on pages 1-4 onto this page. See dictionary on how to rate this section.

A	**SELECTION BIAS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
B	**STUDY DESIGN**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
C	**CONFOUNDERS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
D	**BLINDING**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
E	**DATA COLLECTION METHOD**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
F	**WITHDRAWALS AND DROPOUTS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	Not Applicable

GLOBAL RATING FOR THIS PAPER (circle one):

1	STRONG	(no WEAK ratings)
2	MODERATE	(one WEAK rating)
3	WEAK	(two or more WEAK ratings)

With both reviewers discussing the ratings:

Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

No Yes

If yes, indicate the reason for the discrepancy

1 Oversight
2 Differences in interpretation of criteria
3 Differences in interpretation of study

Final decision of both reviewers (circle one):

1 STRONG
2 MODERATE
3 WEAK

4

Appendix D

Quality Appraisal Breakdowns

Table 6.

Breakdown of quality appraisal for quantitative studies and quantitative parts of mixed methods studies using QATAS.

Study	Selection Bias	Study Design	Confounders	Blinding	Datta collection methods	Withdrawal/ drop out	Overall Rating
1. Baseotto, M., & Godfree, R. (2017)	3	2	3	3	3	3	Weak
2. Bushnik, Kreutzer, Marwitz, Sima & Godwin (2015)	2	1	1	2	1	2	Strong
3. Fortune, Rogan & Richards, (2016)	2	1	1	3	1	3	Weak
4. Knapp, Gillespi, Malec, Zier & Harless (2013)	1	2	3	3	3	1	Weak
5. Kreutzer, Marwitz, Sima, Graham, Hsu, Mills & Lukow, (2020).	3	1	1	2	1	1	Moderate
6. Kreutzer, Stejskal, Ketchum, Marwitz, Taylor & Menzel (2009)	3	2	1	3	1	2	Weak
7. Man (1999)	3	2	1	3	1	1	Weak
8. Sinnakaruppan, Downey & Morrison	1	1	1	3	1	1	Moderate
9. Suzuki & Tanemura (2011).	3	2	3	3	1	1	Weak
14. Kreutzer, Stejskal, Godwin, Powell & Arango-Lasprilla (2010)	2	3	1	3	3	3	Weak
15. Sander, Clark, Atchison & Rueda, (2009)	3	2	3	3	1	2	Weak

Note. QATQS rating for individual components (1= strong, 2, moderate, 3 weak)

Table 7.

Breakdown of quality appraisal for qualitative studies and qualitative parts of mixed methods studies using CASP.

Study	Aims	Methodology	Design	Recruitment	Data collection	Relational considerations	Ethics	Data analysis	Findings	Overall value	CASP score
10. Couchman, McMahon, Kelly & Ponsford (2014)	1	1	1	1	1	0	0	0.5	0.5	0.5	Moderate
11. Donnelly, Goldberg & Fournier (2020)	1	1	1	0.5	1	1	0	1	0.5	1	Strong
12. Lauer-Listhaus, (1991)	0	0.5	0	0.5	0.5	0	0	0	0	0	Weak
13. Straits-Tröster, Gierisch, Strauss, Dyck, Dixon, Norell & Perlick (2013)	1	1	1	0.5	1	0	0	0.5	0.5	1	Moderate
14. Kreutzer, Stejskal, Godwin, Powell & Arango-Lasprilla (2010)	1	1	1	0.5	0	0.5	0	0.5	0.5	0.5	Moderate
15. Sander, Clark, Atchison & Rueda, (2009)	1	1	0.5	0	0.5	0	0.5	0	0	0.5	Weak

Note. CASP rating for individual components (1= strong, 0.5, moderate, 0 weak)

Appendix E

Instructions for authors

Instructions for authors for guidelines for submission to Neuropsychological Rehabilitation.

https://www.tandfonline.com/action/authorSubmission?show=instructions&journalCode=pnrh20#words

SCHOOL OF PSYCHOLOGY

DOCTORATE IN CLINICAL PSYCHOLOGY

EMPIRICAL PAPER

A Qualitative Exploration of Brain Injury Training Needs of Practitioners Working in Third Sector Domestic Violence Organisations.

Trainee Name: Emily Clare Broadbridge
Primary Research Supervisor: Dr Alicia Smith

DClinPsy Academic and Research Tutor,
Neuropsychology & Health Teaching Convenor,
Doctorate in Clinical Psychology, University of Exeter

Secondary Research Supervisor: Professor Anke Karl

Associate Professor of Clinical Psychology and
Affective Neuroscience, College of Life and
Environmental Sciences (CLES), Psychology,
University of Exeter

Tertiary Research supervisor: Dr Louise Gates

Research Tutor, Doctorate in Clinical Psychology,
University of Exeter

Target Journal: Journal of Interpersonal Violence (impact factor 3.573)

Word Count: 7999 words (excluding abstract, table of contents, list of figures, references, footnotes, appendices)

Declaration of Interest Statement: The authors report no conflict of interest.

Submitted in partial fulfilment of requirements for the Doctorate Degree in Clinical Psychology, University of Exeter

Abstract

Study Aims: The aim was to use theoretical understandings of behavioural change, from the COM-B model, to explore the experiences of experts from different contexts working with survivors who may have BI and to make recommendations for training in UK third sector DV organisations.

Participants: Eleven experts by profession and experience in the field of brain injury and/ or domestic violence from the United Kingdom and United States of America.

Methods: Qualitative methodology was employed. Data were collected using semi-structured individual interviews. Data were analysed using reflexive thematic analysis and adopted a critical realist philosophical approach.

Analysis: Analysis constructed three themes with nine subthemes which are explored in detail, these are: 1) Lack of understanding of traumatic brain injury and domestic violence, 2) Specified educational needs of practitioners and 3) Changing practitioners' behaviour.

Major implications: The participants identified factors which influenced practitioners working in UK domestic violence third sector organisations understanding of brain injury in domestic violence survivors, including a gender and racial biases. Participants felt that how change is implemented and maintained in the long term needs to be considered thoughtfully. The behaviour change wheel (Michie et al., 2014) is one way which organisations could identify what they need to do to support organisational and individual level change in practice.

Keywords: Brain Injury, Domestic Violence, Third Sector, Training, Behaviour Change

Introduction

Brain injury (BI) is under-recognised by practitioners working in services for survivors of domestic violence (DV; Nemeth et al., 2019; The Disabilities Trust, 2021). As survivors of DV are frequently not recognised as having brain injuries, they may not receive services tailored to their needs. This raises a concern around how services might be developed to achieve this person-centred care. Training practitioners who work with survivors with BI has been identified as the next step to improve client experience of third sector DV organisations in the UK (The Disabilities Trust, 2021). It is essential when considering interventions which aim to change behaviour in practitioners to consider the factors affecting such change (Dombrowski et al., 2016). One tool to help thinking around behaviour change is the Capability, Opportunity, Motivation-Behaviour model of behaviour change (COM-B; Michie et al, 2011). This section elaborates on the evidence connecting DV and BI, the unmet need of the survivors and third sector organisation’s role in meeting these needs in the UK, and concludes exploring considerations of factors which may impact the much needed change and identifies the gap in the literature.

The Evidence Connecting Domestic Violence and Brain Injury

There is evidence connecting BI to DV as injuries to the head, neck and face are common in DV (Wu et al., 2010). Brain injuries can be sustained in many ways. Traumatic brain injuries (TBI) are caused by external forces such as blunt trauma (e.g., being hit by a fist or an object), acceleration/ deceleration movement (e.g. when the head is pushed with force into an object, like a wall, or is shaken) or rotation (following a trauma the brain rotates in the skull). BI can also be sustained via hypoxia (decreased oxygen to brain tissue) or anoxia (complete cut-off of oxygen to the brain tissue) during strangulation or drowning (Maas et al., 2017). This study will refer to ‘brain injury’ (BI) including both trauma and hypoxia/ anoxia. In research from the United States of America (USA; no similar UK data available), Valera and Berenbaum (2003) found that 74% of survivors had experienced a single TBI and 51% had experienced multiple TBI’s. Wilbur et al (2001) found 68% of DV survivors had been strangled. Around 2.3 million adults (5.5% of the population aged 16-74) experienced DV in England and Wales between March 2019 and March 2020 (Office of National Statistics; ONS, 2020a), this indicates there may be an exceedingly high prevalence of BI in DV survivors in the UK.

BI can cause a range of physical, cognitive, emotional and behavioural difficulties depending on the location and extent of the injuries. More severe injuries cause worse outcomes in both strangulation (Birchard et al., 2021) and TBI (Rassovsky et al., 2015). Survivors of DV may experience repeated BI, with a higher ‘dose’ of injury putting them at a higher risk of difficulties in daily functioning. BI are categorised as mild, moderate or severe, depending on the duration and intensity of loss of conscious reactions (Teasdale & Jennett, 1974). Repeated mild TBI (mTBI) has both short-term and long-term neurological consequences upon mood, cognition and behaviour (Guskiewicz et al., 2005; Mez et al., 2017; Brown et al., 2018; Jackson et al., 2002). Due to the overlap in symptoms from DV and BI, unpacking the physical and psychological consequences of each can be challenging, and may require specialist assessment (e.g. by a Neuropsychologist), which would require a referral to a specialist health service. For these referrals to take place, first potential BI must be identified. Research from the third sector in the UK has found that BI is not known about or identified by practitioners working with survivors of DV in DV services suggesting a training need (The Disabilities Trust, 2021).

Training Needs of Practitioners in Third Sector DV Organisations

In the UK, people experiencing DV are often supported by third sector organisations whose practitioners lack knowledge of BI and its impact and therefore require training to address these needs (The Disabilities Trust, 2021). Practitioners can be defined as "*a person engaged in the practice of a profession, occupation… who practices something specified*" (dictionary.com, 2022) therefore DV practitioners are people working in organisations with survivors of DV. Third sector organisations provide services to help survivors cope with, or flee, violent relationships (ONS, 2020b) and support survivors with their physical, emotional and social needs (Kulkarni et al., 2010). The limited research available indicates that most frontline practitioners working in third sector organisations are not aware that DV can cause BI, are not aware of how BI sequalae may be affecting an individual and are not screening for BI (The Disabilities Trust, 2021; Nemeth et al., 2019).

A lack of understanding about the effects of BI may lead to unawareness of cognitive impairments, and potential over-estimation of a person's cognitive abilities (Swift & Wilson, 2001). It is therefore important for practitioners working in DV organisations to know the potential effects of BI so they are able to 1) understand the reason a person may be acting the way they are, and 2) make adaptions to better enable the person to engage in their services (Ohio DV Network, n.d.). As the population of survivors with BI has several complex psychological, physical and social needs it is important that any training to address this lack of understanding is tailored to the population to best meet their needs. Murray et al (2016) recommend changes in practice in non-medical practitioners working with DV survivors with BI, such as providing screening, referrals to specialist services (e.g. healthcare services), interventions and safety planning. Further research is needed to specify exactly the contents that would be recommended by experts working in the field who intimately know about BI in survivor populations.

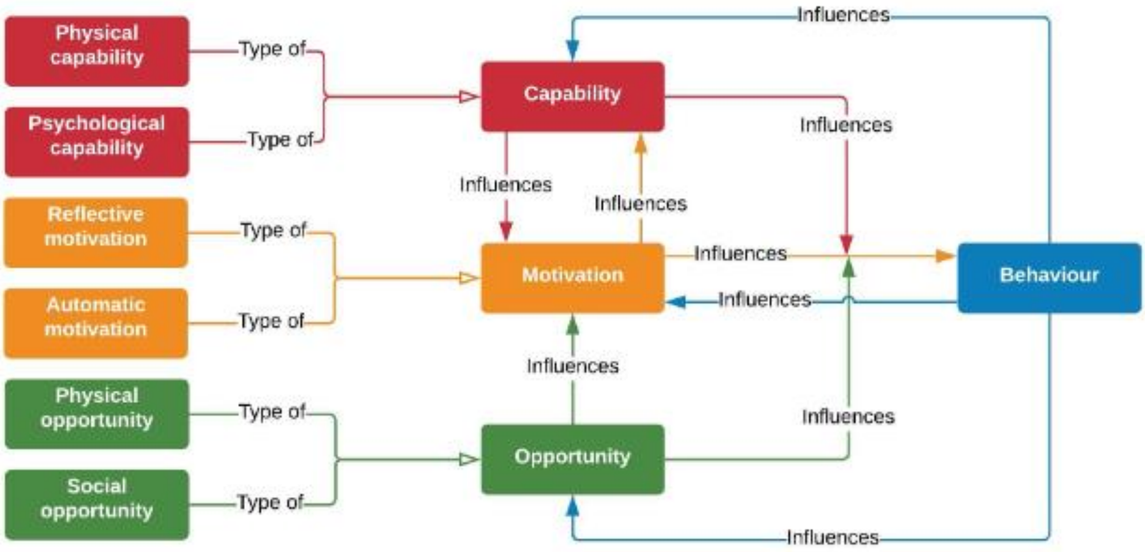
Despite these recommendations in the literature and the long-established link in the literature between DV and BI (Casper & O'Donnell; 2020), practitioner knowledge remains poor, and it is unclear what contextual factors are influencing the current practitioners knowledge of BI caused by DV (The Disabilities Trust, 2021). Literature about changing practice (or behaviour) in practitioners has identified that there are many factors which can influence practitioner’s behaviour other than acquisition of knowledge such as organisational support to implement change (Higuchi et al., 2017).

How We Can Understand the Challenges for Practitioners Using Behaviour Change Literature

To maximise efficacy of interventions targeting change for third sector DV staff, it is essential to have a theoretical understanding of behaviour change including mechanisms of action and moderators of change incorporating specific influences on human behaviour to DV practitioners (Davis et al., 2015). Over time, researchers have proposed numerous models/ frameworks which relate to implementing change in practice to organisations and practitioners (Francis et al., 2012; Michie et al., 2014a). In 2011, Michie et al., reviewed nineteen frameworks and found that none covered a full range of intervention functions, and few were linked with models of behaviour change; they proposed a new framework, known as the COM-B model, which purports that individual behaviour is influenced by Capability, Opportunity and Motivation (see Figure 1.). The model recognises that behaviour is influenced by these components which in turn are a part of an interacting system which varies by context and is a way of understanding what needs to change for behaviour change interventions to be effective (West & Michie, 2020). Although the COM-B model has not been used to explore behaviour change in DV third sector organisations it has been useful in exploring facilitators and barriers to behaviour change in other third sector areas such as mental health (Baxter & Fancourt, 2020) and accessing medical treatment (Whiteley et al., 2020). Understanding the contextual factors which may be specifically affecting the current capability, opportunity and motivation of UK third sector organisation DV practitioners is essential to understand the considerations needed when planning a potential behaviour change intervention (e.g. training) in this population as they are currently unknown.

Figure 1.

COM-B model of behaviour change (p.2, West & Michie, 2020)



The current study therefore sought to fill a gap in the literature to identify those current contextual factors influencing third sector DV organisational practitioner’s knowledge of how BI affects survivors, what the suggested contents of any training about BI in the context of DV would be and considerations when delivering interventions to this population. To integrate behaviour change theory, the COM-B model was utilised in designing the data collection instruments and as a lens with which to aid analysis and interpretation of the findings of the research and to help consider the immediate contextual affects effecting practitioners. Understanding these needs with a UK only sample was difficult as the sparse literature about the needs of third sector practitioners in the UK indicates (Disabilities Trust, 2021) there is currently little knowledge of BI in these organisations, therefore seeking expert knowledge from different countries who have started implementing such training interventions was indicated.

Cross Cultural Approaches to Research

Literature into DV and BI has highlighted the existence and need for cross cultural transfer of knowledge within research to address the urgent need of survivors with BI from being further neglected (Casper & O’Donnell, 2020). Due to the sparsity of experts of BI in DV populations (Casper & O'Donnell, 2020), and the lack of interventions aimed at training DV practitioners about BI across the English-speaking world (The Disability Trust, 2021, Nemeth et al., 2019), the current research sought expertise from both the UK and other countries to address the research aims. Although countries differ in their cultural, political and economic contexts (for example NHS in UK v. Insurance based healthcare in the USA) there is a precedent in the literature to learn from practices from other countries whilst ensuring cultural context is considered (Guilding et al., 2021; Holden, 2001). Although the data collection for this study was not specific to a particular service it is hoped findings will be somewhat transferable as they focus on third sector organisations (rather than, for example, healthcare organisations) and are positioned within the current evidence base (McMahon et al., 2016). Constant consideration of these differing cultural contexts was important when considering the paradigmatic framework and method of data analysis to address the aims of the research.

Aims

The aim was to use theoretical understandings of behavioural change, from the COM-B model, to explore the experiences of experts from different contexts working with survivors who may have BI and to make recommendations for training in UK third sector DV organisations.

Method

Researcher Position

I am a British female, white, middle class, Trainee Clinical Psychologist, living in England and working with people with Learning Disabilities. I have not experienced DV or a BI. Prior to training, I worked with DV survivors in a third sector rape crisis organisation, following this I worked for a third sector organisation which provided help and support for people with BI. I currently live with a relative with a BI. When selecting the project, I realised that although I had worked in these separate organisations, I had not identified DV as causing BI despite the obvious association when the link is made. When designing the project my life experience had led me to hold the belief that third sector organisations were often unaware of BI and this had an adverse effect on both clients (struggled engaging) and practitioner (frustration). Constant consideration of this position has aided reflexivity throughout the research process.

Design

Semi-structured individual interviews were used to explore expert opinion and experience of DV and BI within their specific contexts. Participants included both experts by both experience, and profession in DV and BI. Data were analysed using reflexive thematic analysis (RTA; Braun & Clarke, 2006, 2020).

Recruitment

Participants were recruited using purposive sampling. A list was made of potential expert practitioners (e.g. practitioners working in a DV organisation, speech and language therapist, etc.). Sampling was open to practitioners from all countries however participants meeting this criterion were identified from organisations within the UK, USA, Spain and Canada, from BI and DV Networks and publications. A snowball approach was then used to identify and recruit further participants. All participants were initially contacted by email which included a participant information sheet (Appendix A), consent form (Appendix B), and demographics questionnaire (Appendix C). A second email was sent if no reply was received. All participants were asked of their experience of DV and BI in the demographic’s questionnaire. Non-practitioner experts by experience were attempted to be recruited via snowball sampling however none were identified by participants.

Inclusion Criteria

- Adults over the age of 18.
- Practitioners working in/ with third sector organisations working directly with survivors of DV or;
- Practitioners with expert knowledge of BI in the context of DV or;
- Practitioners who have ever delivered training about BI in the context of DV or;

- People with lived experience of BI sustained during DV.

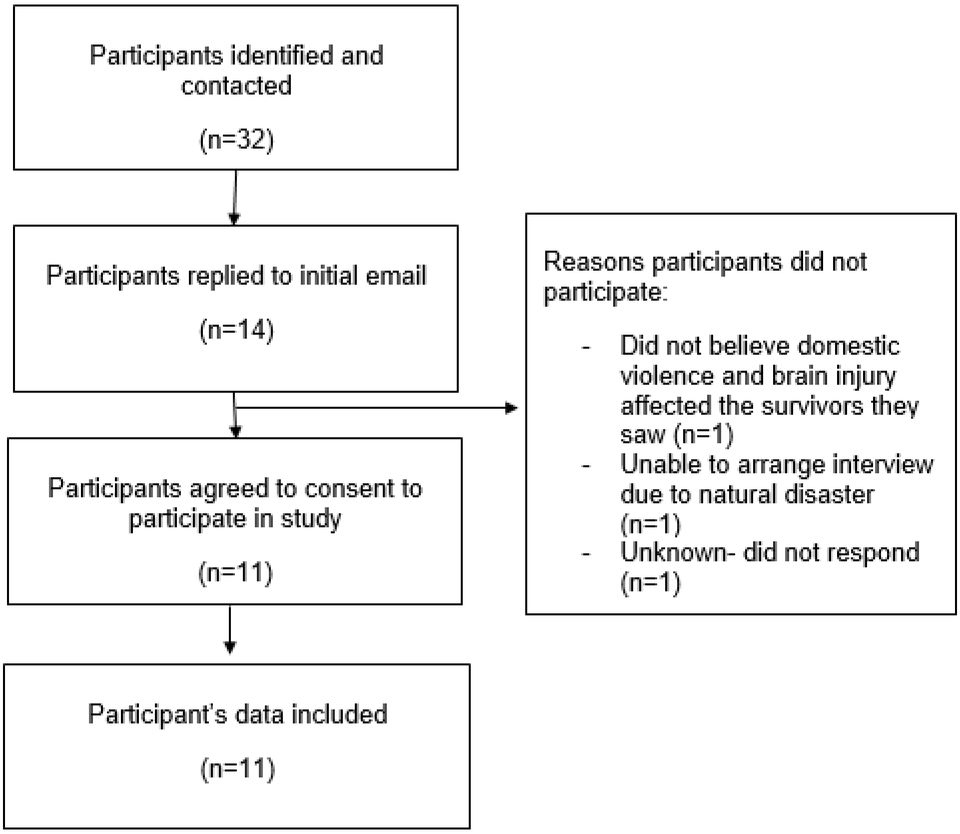
Exclusion Criteria

- People with BI not associated with DV
- Individuals with a severity of injury meaning they would be unable to participate in verbal interviews e.g. severe dysphasia.

Figure 2 provides details of participant recruitment and drop out. Thirty-two potential participants were contacted and eleven agreed to participate. The initial sample approached included nineteen health/ social care practitioners and academics (the majority were both publishing academics and health/social care practitioners) and thirteen were third sector organisations specialising in DV or BI. Although participants were approached from more countries, only participants from the UK and USA agreed to participate in the research, reasons for this are unknown as they did not reply to email contact.

Figure 2.

Flow chart displaying drop out at each stage of recruitment.



Participants

The study sampled eleven practitioners working in and/ or with organisations which support individuals who have or are currently experiencing DV and BI, one participant had lived experience of DV and BI, see Table 1 for participant demographics. It is noted that limited information about participants is reported to protect their anonymity as there are a relatively small number of experts in the field of DV and BI internationally and participants expressed concerns about being identifiable should demographic information be published.

Table 1

Demographic and participant information

Participant Code	Reason Participant was Approached	Country of Work	Self-Identified Sex	Years Experience working with DV or BI
P1	Social Worker and founder of non-profit focused on female BI	USA	Unknown	Unknown
P2	Clinical psychologist with professional expertise in strangulation	UK	Female	7
P3	Speech and language therapist with professional expertise in BI in people who have no fixed abode.	UK	Female	20
P4	Clinical psychologist and researcher with professional expertise in BI in prison populations.	UK	Male	20
P5	GP and forensic physician with professional expertise in sexual violence	UK	Female	26
P6	Social Worker and researcher with professional expertise in DV	USA	Female	38
P7	Social Worker and researcher with professional expertise in DV and BI in older adults.	USA	Female	17
P8	Speech and Language Therapist with professional expertise in BI and communication in Violence Reduction and Youth Offending	UK	Female	8
P9	Clinical psychologist with professional expertise in health consequences and healthcare-based responses to DV	USA	Female	18
P10	Researcher in BI Charity in the UK.	UK	Female	Unknown
P11	Social worker with professional expertise in trauma informed care, DV and BI.	USA	Female	16

Materials

Ethical Considerations

Ethical approval for the study was sought and granted by the School of Psychology Research Committee at the University of Exeter, UK (Appendix D). Interviews were conducted following the completion of consent forms (Appendix B).

Confidentiality and anonymity were discussed and opportunities for questions were given before each interview. Participants were informed that confidentiality could be broken due to safety concerns (Appendix E).

Instruments

Two instruments were used for data collection. A demographics form collected data to contextualise participants' responses to questions (Appendix C). A topic guide was utilised as a tool to collect data to understand the views of the participants (Appendix F) and questions were designed to elicit information about factors affecting capability, opportunity and motivation of third sector practitioners in line with the COM-B Model (Michie et al.,2011). The topic guide was piloted with a peer and subsequently amended to ensure accessibility.

Procedure

Method of Data Collection and Transcription

Participants were interviewed individually. Due to Covid-19, the interviews were conducted via a secure online video platform. Interviews lasted for 50 minutes to 1 hour. Following the interview, the participants were sent a debrief form (see appendix E). All interviews were audio-recorded and transcribed verbatim by a UK-based transcription service.

Data Analysis

Consideration of this cross-cultural context and philosophical lens led to the selection of Reflexive Thematic Analysis (RTA) as an approach to data collection and analysis as I wanted to adopt a method that enabled consideration of the working contexts and reported experiences of participants. RTA "*is suited to both* *experiential (e.g. critical realist, contextualist) and critical (e.g. relativist, constructionist) framings of language, data and meaning*” (p.4, Braun and Clarke 2020). RTA allows the researcher to go beyond the data and consider emotional and influencing contextual factors in theme development as RTA analysis is situated in the interpretative reflexive process (Braun & Clarke, 2019, 2020). This means that the quality assurance of the theme development- which are described as being ‘co-constructed’ between the researcher and participants- lies in the transparency of the researcher’s process for example being clear about the paradigmatic framework adopted and how this has impacted the collection and analysis of data (Braun and Clarke, 2020).

RTA was selected over other qualitative approaches such as ‘codebook’ thematic analyses, such as Framework Analysis (Smith & Firth, 2011) where initial codes are predetermined, as it allowed for an iterative inductive approach, examining the data and reflecting on context, which was important given the cross-cultural context and philosophical lens utilised.

The Use of Critical Realism

Following Braun and Clarke’s recommendations (2012, 2014, 2020), this section clarifies the theoretical assumptions underpinning the analysis, to enable to reader to understand the interpretive approach and thus make their own decisions about the quality and transferability of the findings (Braun & Clake, 2013). This study was founded on critical realism, which sits between essentialism and constructionism. Critical realism adopts a realist ontological framework whilst it rejects the notion that there is a single truth and instead assumes there may be more than one ‘truth’ or perspective on a topic (Cruickshank, 2012). Critical realism is useful for considering knowledge in cross-cultural contexts as it allows a critical lens when analysing the data and consideration of socially and culturally influencing ideas as well as more pragmatic information (Zotzmann, 2016). For example, the social context of DV may vary with cultural norms (e.g. whether DV is illegal or a social norm; World Health Organisation, 2009) however practically how to support individuals with safety advice may be translatable cross-culturally and is important information to capture in both the data collection and analysis. The COM-B model highlights the importance of consideration of social contexts and influencing cultural norms as to how these impact individual's behaviour (West & Michie, 2020) and the critical realist approach and RTA allows consideration of participant and researcher context in analysing data (de Souza, 2014).

How the Six- Phase Framework Was Practically Implemented

Reflexive thematic analysis was used to analyse the data, specifically using Braun and Clarke's (2006) six- phase framework for analysis (see appendix G for practical steps and examples of how reflexivity was utilised at each stage). This section will provide information about how the analysis was carried out and how reflexivity and the philosophical frameworks were considered in the analysis process.

The dataset was listened to via audio prior to coding to enable researcher immersion. Reflexive notes were made during the interviews, when re-listening to audio, during coding and producing themes. Data were analysed using Nvivo-12 software (QSR International, 2020) and coded using line by line, in-vivo coding (Manning, 2017).

Semantic codes are identified through the explicit meaning of the data whereas latent codes identify underlying assumptions, hidden meanings and ideologies which shape the semantic content of the data (Bryne, 2021). In this paper semantic and latent coding was utilised. Initially semantic coding was prioritised to ensure a nuanced understanding of the data and in-vivo line by line coding was utilised to adhere to this. As analysis continued, latent codes and themes were produced when meaningful semantic information was interpreted. This reflected the underlying theoretical assumptions as the adopted philosophical framework was considered in terms of the semantic meaning communicated by the participants and the latent meaning interpreted by the researcher when considering the participant and researcher context (Patton, 1990).

As a researcher I was new to RTA and thus the analysis was a learning experience for me becoming immersed in the data whilst trying to address my research aims. To aid this process, I used questions which related to the topic guide, and therefore the guiding COM-B theoretical model (Michie et al, 2011), to focus my thinking:

1. What are the current challenges to practitioners supporting the needs of DV survivors who have sustained BI?
2. What would help practitioners change their practice to better address the needs of DV survivors who have sustained BI?
3. How could the information best be disseminated to promote behaviour change?

To aid the reflexive process of each stage of the RTA, a ‘reflexive log’ was kept, noting my assumptions, thoughts and feelings the thought process at each stage of the analysis including the context of my assumptions and the participants' if they were explicitly mentioned or I was assuming from cultural contexts (examples in analysis). Peers, colleagues, and supervisors aided reflexivity by questioning reflexive responses to the researchers' initial codes and later themes at each stage of analysis (see Appendix G for examples) to aid with sense checking and exploring multiple interpretations or assumptions.

Analysis

The aim was to use theoretical understandings of behavioural change, from the COM-B model, to explore the experiences of experts from different contexts working with survivors who may have BI and to make recommendations for training in UK third sector DV organisations. Themes from the expert interviews are represented in table 1 as quotations. There was some similarity with the topic guide after analysis, but information was drawn from different areas of the interview topic guide (see appendix F) and guiding questions (see page 112), for clarity these are detailed in table 2 below. In the write up of the analysis, some excerpts of the presented data have been modified to ensure there was no unnecessary information, but the modifications do not affect the meaning (Braun & Clarke, 2013).

Table 2

Summary of themes and sub themes

Expert opinion theme	Expert opinion Subtheme	Questions from topic guide influencing theme/ subtheme development	Questions from guiding questions influencing theme/ subtheme development
1.0 Lack of understanding of brain injury and domestic violence	1.1 The impact of a lack of understanding about brain injury 1.2 Difficulties educating practitioners 1.3 Discrimination due to gender and race	Capability, engagement and training delivery.	Q1- What are the current challenges to practitioners supporting the needs of DV survivors who have sustained BI?
2.0 Specified educational needs of practitioners	2.1 How the brain works and how it is injured from DV 2.2 The impact of the injury and symptoms to look out for 2.3 Working with complex social and psychological difficulties.	Knowledge and engagement	Q1- What are the current challenges to practitioners supporting the needs of DV survivors who have sustained BI? Q2- What would help practitioners change their practice to better address the needs of DV survivors who have sustained BI?
3.0 Changing practitioners behaviour	3.1 Organisational support in influencing change in practice 3.2 Engaging the audience 3.3 What practitioners can do differently to help survivors	Engagement, knowledge and training delivery and evaluation.	Q2- What would help practitioners change their practice to better address the needs of DV survivors who have sustained BI? Q3- How could the information best be disseminated to promote behaviour change?

1.0 Lack of Understanding of Brain Injury and Domestic Violence

Participants reported a lack of understanding across different professional groups including DV and BI specialists.

> *""Within domestic violence experts, specialists, there's the lack of understanding about traumatic brain injury. Then for the traumatic brain injury specialists there's this lack of truly understanding or even acknowledging domestic violence and so from both ends of the spectrum there's this lack."* - P7, USA

> *"This is basically happening to everyone, and we don't know brain injury from a hole in the wall.*"- P11, USA

I noted that participants were passionate about relaying their experiences of this lack of understanding as well as being keen for me to understand the many contextual factors affecting this lack of understanding. The analysis identified three subthemes which participants felt were influencing practitioners understanding of the link between DV and BI and to help "*build up the context of why we might not have seen something*" (P5, UK).

1.1 The Impact of a Lack of Understanding About Brain Injury

One reason for this lack of understanding was that *'people don't really understand very much about the brain in genera*l' (P3, UK). There is a lack of awareness of how a brain can become damaged from DV and what practitioner may see on the frontline as a consequence of this damage.

> "*We have some people who come into shelter who have literally like acute post-concussion, which we have never even identified. I remember working with those survivors who literally had bruises on their faces, and we were like, "Why is she having so much problem with her case planning?""*- P11, USA

Due to this lack of awareness, practitioners are not likely to recognise symptoms of BI, and therefore difficulties may be mislabelled. Their difficulties may be contextualised as social or mental health difficulties rather than because of BI. This lack of understanding in medical professionals can result in survivors struggling to access specialist services.

> *"I wish I had a nickel for every time I had a woman come to me and said "No, the doctor won't give me a referral for the Neurologist because he thinks the stress and the forgetfulness and the memory loss is really just anxiety or post-traumatic stress disorder.""* -P6, USA

In contrast to most interviewees, one participant felt that there was a good awareness of BI and felt concerned that BI were being prioritised over other factors which may be affecting survivors such as post-traumatic stress disorder (PTSD) symptoms.

> *"I do find that there might be an overemphasis on head injury and TBI among domestic violence survivors because it's been getting so much attention*"- P9, USA.

This is interesting given the context of the participant who works with survivors and is a researcher. It is noted that the participant works closely with other researchers in an area in the USA where there are programmes set up to educate practitioners in services and survivors about BI, unlike other areas in the USA and UK where all other participants reported that such programmes do not exist. Contextually, it is important to consider that participants were from the USA and the UK. Differences between the two countries were highlighted, for example UK participants who felt that the USA had more awareness of BI generally and in the context of DV. This finding is in line with the literature described in the introduction with a sparsity of peer reviewed research in the UK with more publications in the USA (Nemeth et al.2019, The Disabilities Trust, 2021).

> "*I think America are ahead of us*."- P2, UK

> *"I had a bunch of four or five different papers, all from the States, none of it was from the UK"*- P3, UK.

I note that contextually P2 is from the UK and I understood her to be talking about the USA when she said 'America' as, although America is a continent, in my experience people living in the UK often refer to the USA as 'America'.

Finally, an understanding of the impact of BI does not mean that practitioners are aware of what to practically do about these difficulties.

> "*So they register that people may have these difficulties, but then they don't know what to do; on a clinical level, they don't know what to do. They don't understand you have to keep the lights low, they don't understand that people may have difficulty following directions*."- P6, USA.

1.2 Difficulties Educating Practitioners

Participants who understood BI and DV and were in positions to provide training to third sector organisations identified barriers to accessing the practitioners who require the training. Third sector organisations often have limited time and money.

> *"the reality is domestic violence programmes are so crunched for time, for resources, they are dealing with so much.*"- P11, USA.

Furthermore, access to practitioners can be a barrier as experts may be willing to provide training but may not have access to practitioners due to, for example, working in different organisations. I reflexively noted that this was pertinent particularly in the UK context where participants reported that the DV charities are smaller organisations rather than the state-wide programmes they have in some areas of the USA where participants were from.

> "*getting access to people can be a barrier, so it's only as I've started in some different roles that I've had access to these groups of people"* -P8, UK.

When experts do have access to practitioners to provide training, they have found that high practitioners turnover means one-off training would not be effective, and so to maintain awareness/ knowledge, training needs to be provided regularly.

> *"you do this training and the next year 75% of the staff there wasn't at that training"*- P11, USA.

1.3 Discrimination due to Gender and Race

Another contextual factor was discrimination, particularly discrimination due to gender and race which will be explored in this subtheme. In my reflexive log I noted a feeling of confusion and anger in participants as to why BI in the context of DV was not commonly talked about and understood. Participants identified a gender bias in the literature; there is a lack of research specific to women's BI, particularly in the context of DV. Participants linked the gender bias in the literature to funding which has been more accessible to male dominated areas, such as sport populations, despite the higher prevalence of women experiencing injuries from DV compared to men in sports.

> *"if you look at 1800 football players and they're getting all the money in the world to look at their head injury, and we now think it's – I was just writing this statistic this morning - I think it's 32 million women that we think have head injury, and we have to fight for every dollar that we get*." -P6, USA.

Participants reported this gender bias was not only in the literature but also in practice. Participants noted that there were different expectations put upon male and female clients and these expectations then affected access to specialist medical professionals.

> *"there was an expectation that female clients, their communication would be stronger … but nobody has actually assessed that because this group hasn't seen a Speech Therapist"*- P3, UK.

I noted reflexively here that participants from the UK and the USA talked mainly about women's experiences and generally referred to survivors as 'women'. Although I attempted to recruit participants who worked with male survivors I was not able to do so, this is very likely to have impacted the findings and theme development.

Participants report that some minority groups may be less likely to disclose DV, such as people who are homeless, people with learning disabilities, elderly people, and people from ethnic minority backgrounds resulting in lack of identification of DV. Exacerbating this difficulty, participants report there are racial biases due to a lack of awareness of understanding visible signs of injuries; for example, bruising is not as visible on darker skin. Difficulty seeing bruises may affect practitioners' abilities to detect injuries, particularly to the head, face and neck, which can affect recognition of DV, as DV may be identified by clinicians noticing visible injuries. Detection or evidencing of injuries is a pertinent criminal justice issue which can affect prosecution of perpetrators.

> *"The colour issue, skin colour, is something that it's only this last year that I've really been thinking about. Police and CPS, the influences about whether they charge and whether they proceed will be injury rates but if there's no injury seen they're less likely, but we're only telling half the story if we don't also say "And also, they had very dark skin colour so we're less likely to see injuries""*- P5, UK.

In my reflexive log I noted that the interviews were during the time when the social justice movements Black Lives Matter and Walk These Streets were prominent in the media in both the UK and the USA where participants were living and working (Hodkinson et al., 2021). I also noted that in the media conversations about DV had increased due to lockdowns caused by corona virus (Snedaker, 2020). When considering the social context at the time I noted that it is likely therefore that these social justice movements which all participants would likely have been experiencing in the last year influenced participants' views and responses and my analysis.

2.0 Specified Educational Needs of Practitioners

Participants identified the need for training to be theoretical but also practical in nature. Whilst it is outside the scope of this paper to provide written summary of all the topics participants thought important for practitioners to know about the sub themes provide a summary of the overarching areas that experts felt that practitioners need to understand about BI and DV. I noted reflexively that the topics identified for practitioners to know about I felt translated cross culturally from the USA and UK. For example, in both countries DV against a spouse is illegal and therefore there are similarities with agencies such as social services, shelters and law enforcement, these would not be translatable to all other cultures (Sawe, 2018).

2.1 How the Brain Works and How it is Injured From DV

Participants suggested that practitioners should be given a simple, basic understanding of how different areas of the brain work. These brain areas can then be related to people's daily functioning and why we need each area of the brain to work.

> "*Let's understand the brain, let's understand that different pieces and parts of our brains are responsible for different things…it's really important that all of these pieces work together and that's the way I can talk to you and move my hands and do all of these kinds of things and think about what's coming next."*- P11, USA.

Participants thought that practitioners should understand exactly how the brain can be damaged from DV so that they were more likely to have it in mind if survivors are talking about it. Two ways in which participants identified the brain could be damaged was through injury to the brain via trauma or strangulation.

> ""*Oh yeah, he would either be choking me and bang my head, or he would take me by the hair and slam me into the wall or the dashboard.""* – P6, USA.

2.2 The Impact of the Injury and Symptoms to Look Out For

Participants described that whatever the mechanism of injuries to the brain, be it traumatic BI, hypoxia/ anoxia or both it is important for practitioners to understand that these injuries may have psychological and physical consequences which can impact survivor's functional ability and how these difficulties may present in practice.

> *"People might attribute that to the psychological trauma of being battered but also making sure they understand the physical impact on the brain of being battered. Cognitively, I think, is really important as well, whether it's TBI from being hit or hypoxia from being strangled, these things, it's going to affect things like executive function, so women's ability to make decisions, to weigh up stuff, to plan, to problem solve, make judgements about things."*- P2, UK.

Participants reported that the symptoms of these injuries are often invisible and therefore the signs and symptoms that they may be seeing may not be what practitioners commonly understand to be symptoms of BI.

> "*stressing to people that all of these difficulties are completely invisible, so when you are looking out for it you're not looking out for a person with slurred speech… you're looking for the actual symptoms that we know about as professionals."*- P8, UK.

2.3 Working with Complex Social, Physical and Psychological Difficulties.

Participants further described that the above difficulties highlight the complexity which survivors can present with due to BI. Other health and social factors affecting survivors are important to consider. Survivors may be parents who may be frightened of losing their children, they may have ongoing court proceedings, no secure housing, difficult relationships, chaotic lifestyles, substance misuse difficulties, poor education, mental and physical health difficulties and historic or ongoing trauma. Survivors may not necessarily be in a place of safety and may still be experiencing abuse. These experiences alone may be stressful and/ or traumatic and may have physical and health consequences. These difficulties need to be considered by practitioners as well as BI to normalise difficulties for survivors and help provide appropriate, meaningful support.

> *"we're talking about this brain injury plus, we're also acknowledging the mental health impact, we're also acknowledging substance use, we're acknowledging suicide, and that's our job as advocates to create an environment where we're bringing this up and we're saying things like "it is really common to struggle with these things, and we really want to be there to help support you and to help you better understand what has happened to you,""*- P11, USA.

To aid this communication, participants felt training should acknowledge the impact of trauma on survivors; taking a trauma-informed care approach can help survivors engage with services. Many practitioners working in DV organisations may have experienced DV or other trauma themselves and a trauma informed system could help survivors and practitioners feel supported.

> "*more trauma-informed systems in place for people to be able to feel supported and understood but that what they are doing is actually supporting people who are often very traumatised themselves, so it can be quite a tricky process*" -P4, UK.

3.0 Changing Practitioners’ Behaviour

The final theme takes a step beyond training and considers the change needed on an individual and wider organisational level that participants identified were needed to enable change in practice on the ground.

“*Training is fantastically important… it has to fit in part of a larger context about how to get programmes to actually do things differently”*- P11, USA

3.1 Organisational support in influencing change in practice

Participants felt that organisations need to be engaged in the process of providing education and resource to help practitioners learn about BI and support them to make changes in their practice.

> *“this really being the responsibility of the domestic violence programme to start to figure out how to talk about this and educate about this and provide information about this.”* -P11, USA.

Participants reported that survivors, BI experts/ organisations and DV experts/ organisations could work together to understand the needs of survivors and DV organisations and merge their skills to provide training. Building connections to existing organisations who provide training was felt to be essential for organisations to feasibly provide education to support change.

> *“So that collaborative approach is going to bring expertise from us from one sector, and them from another… is probably the smart way to go*.” -P10, UK.

Participants felt that organisations cannot expect one training session to change practitioners’ practice or for practitioners to feel confident in talking about BI.

Practitioners need ongoing support in terms of easy access to information and resources, clear ongoing referral routes, someone to talk to about any client specific needs and ongoing top-up training.

> "*you need to get your buy-in from staff so it can't just be a one-off thing and then just leave it and expect the change to be there, I think it needs to be either a few sessions or as part of a wider programme*" -P8, UK.

3.2 Engaging the Audience

Participant reported that thinking about *how* to engage busy practitioners, with high turnover, in a topic which may be perceived as adding more burden to their workload is essential in thinking about delivering training.

> *"your easy bit is going to be the training content, so it's going to be the engagement with the training that's going to be the issue."* -P3, UK.

Participants had much experience and suggestions for engaging practitioners. Participants reported that practitioners are generally motivated to help their clients and want to do a good job; engagement difficulties are therefore likely to be around lack of resources or not understanding why it was important to know about BI. The idea of selling the need for better understanding of BI to help make their jobs easier and to help improve the lives of the survivors was felt to be an important way to motivate practitioners to engage with training.

> "*when we better understand brain injury it actually makes our work and our services easier and more effective, that we're understanding what we're seeing, and how to manage things in a different way"* -P11, USA.

When considering delivery of training in thinking about a lack of resource participants suggested that training could be delivered as part of an existing meeting or event rather than as an additional thing for practitioners to have to attend. For example, training could be a part of team meetings, induction training or annual training.

> "*rather than adding yet another thing, build on what's already existing*" -P5, UK.

How the training is delivered was also felt to be essential; participants advocated for training to be interactive to ensure that the training is interesting and gets practitioners to think about what they would do in practice.

> "*It can't just be you talking through slides. It's like the basic information on the slides and then you're really having good conversation so it's a reciprocal session.* "- P8, UK.

Participants reported that frontline practitioners may have varying experiences of education and may or may not value training. Training therefore needs to be engaging and pitched at a level that is digestible for everyone in the audience.

> "*it's trying to figure out how to take this brain education, this neurology education, and bringing it down into the trenches so that everybody can understand it*" -P6, USA.

Furthermore, participants reported thoughtfulness is needed in relation to thinking about how such information is received, particularly in relation to the trauma-informed practices discussed earlier. People can be emotionally overwhelmed by too much information about trauma which can disengage the audience.

> "*They trauma dumped these guys… It overwhelmed them and you could tell they would not ever go to another one again… Not that you can make it appealing and light-hearted, but shock and awe, I feel, turns people off.*"- P1, USA.

3.3 What Practitioners can do Differently To Help Survivors

Participants reported training should provide practical advice about how practitioners can support survivors, or, as P9 so eloquently put it, "*if we are going to spend energy training people, what can they do that's helpful*". Identifying potential BI or screening for BI was considered to be important in helping survivors.

> "*just identifying the women in the first place I think is really key*"- P2, UK.

Participants reported survivors may be coping with sequalae of BI without understanding why they are struggling with certain things, making a connection between the BI and the functional consequences survivors are experiencing may be both helpful and validating.

> *"Finding out you have a brain injury makes one generally feel better, not worse, because before that you think you are stupid and dumb. It helps with the gaslighting that there is something physical."*- P1, USA.

Participants reported that once a potential BI had been indicated then practitioners needed information on what to do next as the survivor may or may not have a BI. This included being able to provide information about BI to survivors, knowing who to refer to in the local area for survivors to get specialist help and providing a safe space to talk about the consequences.

> “*Some patients might take them up on follow-up resources, some might not want those kind of resources but appreciate having the conversation and they have a better patient provider relationship as a result.”* -P9, USA.

Participants thought it would be useful for practitioners to understand what accommodations they could make in their practice to help with the consequences of BI to meet the needs of the clients they serve.

> *“that whole kind of responding through accommodations and really thinking about how are we making our services work for you as opposed to assuming you need to have the ability to do ABCDEFG to come in to our services, and if you can’t, it’s you.”*- P11, USA.

Finally, participants thought safety planning specifically relating to BI was an essential component of helping survivors. This included helping survivors to understand the risks of cumulative damage to the brain and how to practically mitigate these risks, particularly if they were returning to an abusive environment. For example, going to rooms with less furniture if falls are likely or putting arms up to protect the head from assault.

“work on safety planning in general but also around extra protection of the head during physical assaults.” -P9, USA.

Discussion

The aim of the current study was to use theoretical understandings of behavioural change, from the COM-B model, to explore the experiences of practitioners from different contexts working with survivors who may have BI and to make recommendations for training in UK third sector DV organisations.

The study used the theoretical model, COM-B, in creating the topic guide and in consideration of questions to guide analysis to ensure that capability, opportunity, motivation and their impact on behaviour change was considered throughout planning, data collection and analysis. Analysis of participant's responses identified that in participants' experience there is not only a lack of understanding of BI in DV practitioners and how it impacts survivors, but also a lack of understanding that DV can *cause* BI in BI practitioners. The participants identified some influencing factors they have experienced such as cultural biases related to gender and race and a lack of resources to provide education and embed change in organisations with high staff turnover. Regarding recommendations for training, the experts believed third sector practitioners should be aware of BI, how it impacts survivors in addition to the other systemic factors which may be influencing the survivor's behaviour and practically what practitioners can do to help. Importantly when considering training, the expert participants noted the overwhelming need to ensure that any education is done with DV organisations to encourage systemic changes to provide support to practitioners from training planning and delivery to subsequent expected change in practice, in fitting with current literature on organisational and individual behaviour change (Gesme & Wiseman, 2010; Leathers et al., 2016). As such participants experience and views highlighted several theoretical and clinical implications which could be considered for future research, these should be carefully considered within the limitations of the research.

Clinical Implications

The study identified that there are racial and gender biases when clinicians see survivors which may be impacting their ability to recognise physical injuries (due to darker skin not seeing bruising) or symptoms of BI (expecting better communication from females). In my reflexive log I noted my position as a white researcher and the discomfort I felt when hearing that people with darker skin are often not identified as experiencing DV due to the difficulties seeing injuries, a topic which has been reported in recent media (Summers, 2021). DiAngelo (2018) notes that discomfort of white people talking and thinking about racial differences can perpetuate the difficulties being experienced by non-white people. The participants observations of this need highlight the problems and the need for training for practitioners to be able to explicitly address racial inequalities by asking about injuries, even if they are not visible. The increased risk and apparent neglect of communication disorders identified by some participants are in line with research and recommendations for specialist speech and language therapist assessment in female survivors of DV (Ballan & Freyer, 2019). Specifically, the collaboration between experts to share knowledge for practitioners to be able to recognise this need for onward referral to specialists and to help put in place communication recommendations (Ballan & Freyer, 2019).

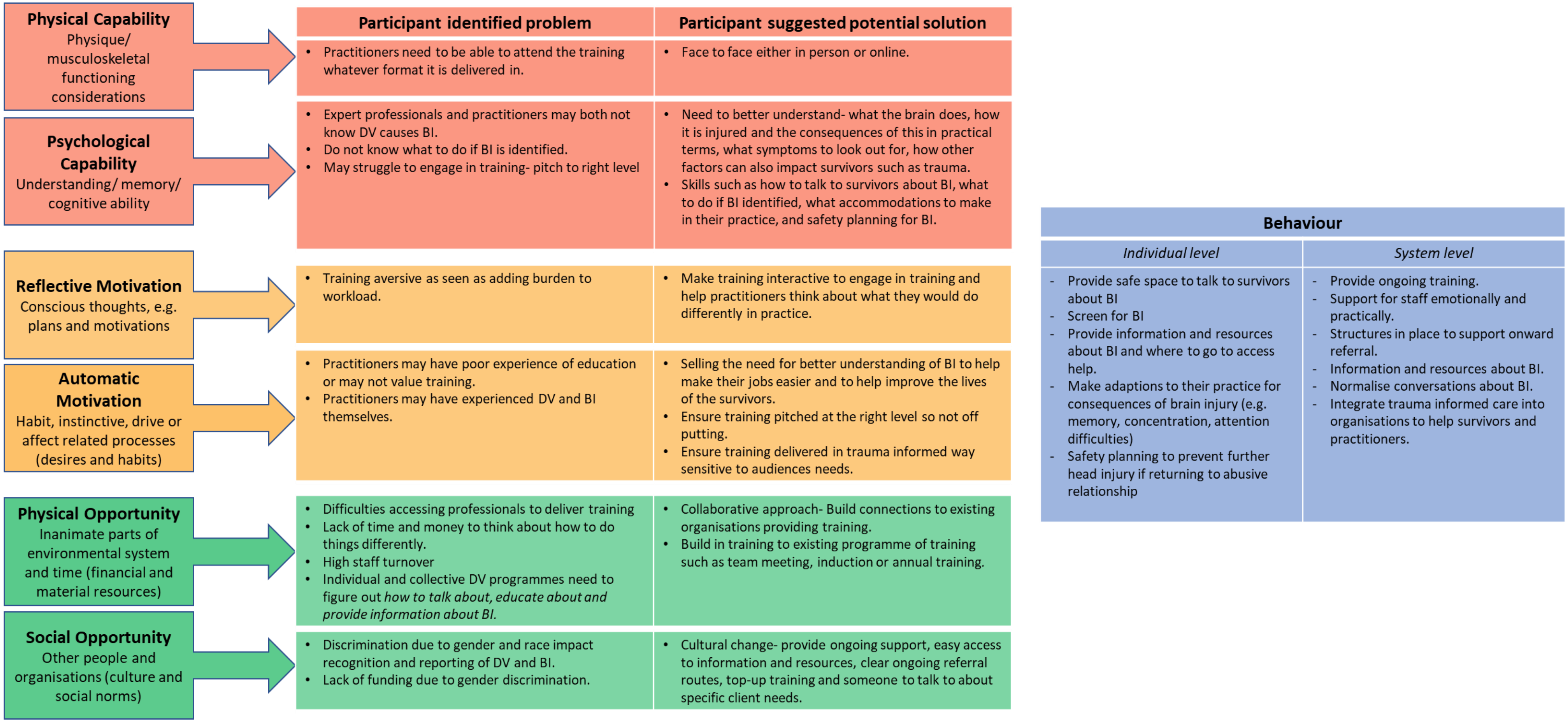
The participants noted that, in line with professional behaviour change literature, change at an individual practitioner level was influenced by organisational support and links with other agencies which take time and energy to build, whilst working in a resource stretched environment (Gesme & Wiseman, 2010; Leathers et al., 2016). Clinical psychologists are trained to think and work systemically, and these skills of formulating systemic difficulties help organisations in thinking about barriers and enablers of change in line with behaviour change theory (Leathers et al., 2016).

Theoretical Implications

Participants highlighted that training alone was insufficient to lead to change in practitioner's practice in UK third sector organisations, this is in fitting with current literature which indicates that knowledge acquisition alone has been found to be a poor indicator of behaviour change in in practitioners (Arlinghaus et al., 2018). The COM-B model (Michie et al., 2011) has been utilised to helpfully demonstrate the multitude of factors which participants felt need to be considered when planning training for practitioners in third sector DV organisations. Figure 3 summarises the factors which analysis constructed (information was lifted directly from each theme and put into the figure).

Figure 3.

Figure delineating components of the COM-B model (West & Michie, 2020) which analysis determined that participants identified as important when considering behaviour change for practitioners working in third sector DV organisations.



	Participant identified problem	Participant suggested potential solution
Physical Capability Physique/ musculoskeletal functioning considerations	• Practitioners need to be able to attend the training whatever format it is delivered in.	• Face to face either in person or online.
Psychological Capability Understanding/ memory/ cognitive ability	• Expert professionals and practitioners may both not know DV causes BI. • Do not know what to do if BI is identified. • May struggle to engage in training- pitch to right level	• Need to better understand- what the brain does, how it is injured and the consequences of this in practical terms, what symptoms to look out for, how other factors can also impact survivors such as trauma. • Skills such as how to talk to survivors about BI, what to do if BI identified, what accommodations to make in their practice, and safety planning for BI.
Reflective Motivation Conscious thoughts, e.g. plans and motivations	• Training aversive as seen as adding burden to workload.	• Make training interactive to engage in training and help practitioners think about what they would do differently in practice.
Automatic Motivation Habit, instinctive, drive or affect related processes (desires and habits)	• Practitioners may have poor experience of education or may not value training. • Practitioners may have experienced DV and BI themselves.	• Selling the need for better understanding of BI to help make their jobs easier and to help improve the lives of the survivors. • Ensure training pitched at the right level so not off putting. • Ensure training delivered in trauma informed way sensitive to audiences needs.
Physical Opportunity Inanimate parts of environmental system and time (financial and material resources)	• Difficulties accessing professionals to deliver training • Lack of time and money to think about how to do things differently. • High staff turnover • Individual and collective DV programmes need to figure out *how to talk about, educate about and provide information about BI.*	• Collaborative approach- Build connections to existing organisations providing training. • Build in training to existing programme of training such as team meeting, induction or annual training.
Social Opportunity Other people and organisations (culture and social norms)	• Discrimination due to gender and race impact recognition and reporting of DV and BI. • Lack of funding due to gender discrimination.	• Cultural change- provide ongoing support, easy access to information and resources, clear ongoing referral routes, top-up training and someone to talk to about specific client needs.

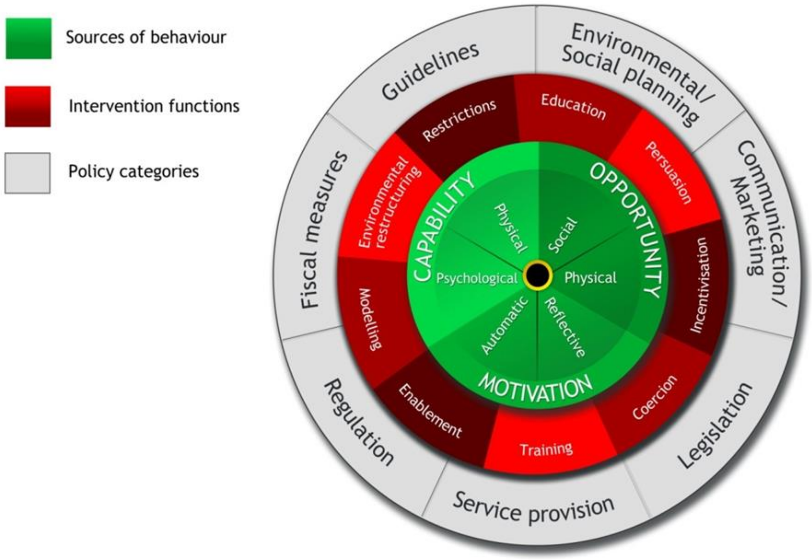
Behaviour

Individual level	*System level*
- Provide safe space to talk to survivors about BI - Screen for BI - Provide information and resources about BI and where to go to access help. - Make adaptions to their practice for consequences of brain injury (e.g. memory, concentration, attention difficulties) - Safety planning to prevent further head injury if returning to abusive relationship	- Provide ongoing training. - Support for staff emotionally and practically. - Structures in place to support onward referral. - Information and resources about BI. - Normalise conversations about BI. - Integrate trauma informed care into organisations to help survivors and practitioners.

The third theme in the current study indicated experts awareness that systemic considerations are needed for individual behaviour change; the Behaviour Change Wheel (BCW; Michie et al., 2014) builds upon the foundation of COM-B and is a culmination of behaviour change models which attempts to identify the multitude of systemic factors which can impact an individual’s change in behaviour. The authors suggest this is used in addition to the Theoretical Domains Framework (TDF; Francis et al., 2012) to determine specific behavioural aims when planning interventions.

Figure 4.

Behaviour Change Wheel (p. 7, Michie et al., 2014)



The BCW and TDF provide a useful theoretical guide for future research to build upon the current paper’s findings and specifically identify what behaviour change in practice is needed at an individual and organisational level.

Future Research

Expert participants supported findings by Valera et al., (2021) that females are underrepresented in TBI literature including clinical trials and studies which primarily focus on males (for example sport concussions; Resch et al., 2017). Expert participants felt this gap is undoubtedly impacting our theoretical understanding of female BI related to DV, supporting the reported discrepancy identified by Casper and O'Donnell (2019). This paper therefore supports Valera et al's (2021) conclusions that understanding sex differences and how these differences can be incorporated in research should be an essential aspect of future research.

The current paper also supported findings that racial biases in female BI research need to be addressed by future research to address this health inequality and support evidence-based practice (Toccalino et al., 2022). The paper supports findings that non-white survivors may not be recognised as experiencing head injuries through DV (Hymel et al., 2018) and BI screening is needed for survivors to better identify unmet health needs such as BI and address this inequality (Oakley et al., 2021). Future research could therefore focus on what intervention may be needed to encourage screening for non-white BI in survivors.

The study was not a service evaluation which aimed to '*judge the quality of the current service*' (p.65, Twycross & Shorten, 2014), but rather was to '*generate new knowledge/ add to the body of knowledge'* (p. 65) and therefore interviewed participants across different organisations from the UK and USA rather than one organisation. As identified by participants each organisation and individual will have their own needs and any intervention needs to be tailored to these needs. Future research could therefore build upon this work by looking at a specific organisation in which to implement a behaviour change intervention and could utilise Michie et al's (2014) Guide to Designing Interventions using the Behaviour Change Wheel, discussed in theoretical implications above.

Limitations

Though participants were expert professionals in the USA and the UK the study aim was to explore the needs of UK third sector DV organisations, findings should be carefully considered in terms of transferability. Ideas of what the needs of DV organisations, practitioners and individual survivors will vary depending on national context, for example I noted in my reflexive log some difficulties are similar between countries (such as not being able to refer onwards) but for different reasons depending on country (e.g. in the USA because the survivor does not have insurance so can't pay for healthcare, compared to in the UK where participants reported disparate service provision and lack of service availability). This is just one example of varying national context which could impact participants answers, it is not possible to understand in the limited interview time the specific context of each participant, their influencing personal views, organisational context or the depth and breadth of their 'knowledge' (Buckwalter, 2019; Pynn, 2017). The purposive sampling enabled cross-cultural transfer of knowledge, to learn from places where the interventions had already been implemented as there is a president in the literature to do so (Guilding et al., 2021; Holden, 2001). The findings may have been more detailed about the UK context if only UK participants were recruited, more participants from UK DV organisations and experts by experience. As per the guidance of Braun and Clarke (2021) it is hoped the transparency of the research process will enable the reader to make their own decisions about what is transferable and applicable to their cultural context and helpful for future research.

Critical Appraisal

The recruitment method employed resulted in risk of deductive disclosure (Tolich, 2004) as the individuals' traits make them identifiable in the write up by contextual identifiers (Sieber & Tolich, 2012). Due to the recruitment method of targeted recruitment to expert professionals about DV and/ or BI and subsequent snowballing technique, expert participants were from a very small pool of professionals who are known to be interested in this field through work or academia. Breaches in confidentiality were therefore a risk and this resulted in a conflict between protecting participants identities and providing a rich, detailed account of the participants social perspectives. There is debate in the literature about methods of ensuring confidentiality such as changing non-essential participant details including, for example, where they live however this has implication in trustworthiness of research (Kaiser, 2009). Ultimately, I decided that minimum information would be provided to balance the transparency of the research process with the confidentiality of the participants, which unfortunately leads to less transparency in reporting of the study which is an additional limitation of the study.

I noted reflexively that all participants tended to refer to women as survivors rather than men despite reports that 14% of men report DV in their lifetimes (Foushee, 2017). Whilst this may be because more women report experiencing DV than men and may be more likely to experience injury due to men being stronger when inflicting injury (Wu et al., 2010) it is important to highlight that men experience DV and are at risk of BI from violence against them from both men and women (Costello & Greenwald, 2022). Transgender people report the highest levels of physical abuse from partners (Scottish Transgender Alliance, 2010) and literature indicates that transgender people struggle to access protection afforded to non-trans people and are a seemingly invisible population in the field of DV and BI (Yerke & DeFeo, 2016). Due to the limited resources of time, difficulties recruiting expert participants and being a solo researcher, this study did not specifically give voice to male or transgender survivors with BI, particularly experts by experience, and future research should consider these important populations and how their needs are met in addition to women's.

Conclusion

Reflexive Thematic Analysis of participant's responses utilising a critical realist lens identified factors which influenced practitioners working in UK DV third sector organisations understanding of BI in DV survivors, including a gender and racial biases and a lack of resource. Participants felt that how change is implemented and maintained in the long term needs to be considered thoughtfully. The behaviour change wheel (Michie et al., 2014) is one way which UK DV organisations could identify what they need to do to support organisational and individual level change in practice when planning training interventions to best support third sectors practitioners working with survivors with BI.

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Appendix A

Participant Information Sheet

Study title: Creating a psychoeducation training programme for third sector organisation staff working with people who have experienced brain injuries due to domestic violence and abuse**.**

Researcher name: Emily Broadbridge, Trainee Clinical Psychologist

Invitation and brief summary

The current study aims to ask professionals and people with lived experience of brain injury and domestic violence for their views on what would be useful to include in a psychoeducation training programme. The education programme will be aimed to be delivered to third sector (e.g. Charities) staff who work with people who currently or previously have experienced brain injuries due to domestic violence. Please take time to consider the information carefully and to discuss it with family or friends if you wish, or to ask the researcher questions.

Purpose of the study

The purpose of the study is to

1) Find out what support workers for survivors of domestic abuse need to know in order to recognise signs of traumatic brain injury. Why is this necessary? Research found that abuse survivors with brain injury can struggle thinking, speaking with others and managing their emotions but this may be easily overlooked when survivors seek help.
2) Ask you about what you have found useful or would find helpful so that this can be included in a training programme for staff working with people who have experienced domestic violence.
3) Ask how we can best deliver the training and evaluate how useful the training is.

This information will tell us what we need to include in our training program for staff, and the researcher will develop the programme.

Why have I been approached?

You have been invited to take part in the study as you have been recognised as being a person who is an “expert by experience” in domestic violence and brain injury and/ or a person working with people who have experienced domestic violence and brain injury.

What would taking part involve?

1. You will be invited to attend a 1:1 interview about your knowledge about brain injury caused by domestic violence and how this might affect people and how they work with third sector organisations. Due to corona virus restrictions, the interview will be held via video conferencing (e.g. Skype, Zoom or Microsoft Teams). This interview should not last longer than an hour.
2. Following the individual interview, if you feel upset you can opt-in to have a chat with the researcher if you would like support for your emotional welfare.

What are the possible benefits of taking part?

There are no specific benefits to taking part in the study, to you personally. The benefit of the research will be for other people, such as the individuals working in charities and the clients who may be living with brain injuries which have not been noticed before. They will benefit as the training programme will be developed to deliver to them and you will help develop the training programme.

We believe having diverse perspectives on the topic of brain injury and domestic violence will enable us to develop accessible, relevant and useful training resource.

What are the possible disadvantages and risks of taking part?

Brain injury and domestic violence are sensitive and emotional topics, which might be upsetting. If for any reason you feel uncomfortable or upset, you can take a break in the research discussions or withdraw from the study. The researcher can direct you to sources for support and the offer one off telephone support at the end of participating in this research.

What will happen if I don't want to carry on with the study?

Taking part in this study is voluntary. You have the right to stop taking part in the study **at any time** **without giving a reason** why you are leaving. Please just let the researcher know by emailing ecb221@exter.ac.uk. Please note, after the interviews have been transcribed anonymously, it will not be possible to withdraw your individual participant data (i.e. as it is anonymous we cannot take your data out from everyone else's, once the data has been analysed).

If you feel uncomfortable with any questions, please feel that you can stop at any time or refuse to answer questions; you may refuse to answer any particular question(s).

How will my information be kept confidential?

All information you provide will be kept confidential and anonymous. This means no one will be able to see the transcripts outside the research team and your name or any way of identifying you will be removed from the transcripts. You will be allocated a participant number which all your information will be identified by. Information that is not anonymous, such as the consent form, will be stored separately to all other data.

Interviews will be audio recorded, transcribed, and analysed for themes. Once transcribed, to protect your anonymity, the audio recordings will be deleted. Under General Data Protection Rule (2018) you have the right to have full access to your transcript of your interview. You can access this transcript to check your responses, accuracy of the recording, to make changes to your response or for your own requirements.

Where will my data be kept?

Your personal information will be stored securely on the university secure servers (OneDrive) and all electronic data (including audio files and transcriptions) will be identified by participant number and kept in a separate, password protected file. If a paper consent form is sent through, it will be scanned electronically and then shredded. If you decide you no longer want to participate all information will be deleted up to your participant number.

The research data will be stored securely on an encrypted, password protected computer which can only be accessed by the research team, held at the University of Exeter. After the research is finished, the data will be securely destroyed at the end of a seven-year period. Your personal data (such as the consent form) will be destroyed following analysis of the data.

When will confidentiality be broken?

Confidentiality will only be broken when required by the law or psychological ethical guidelines (for example in cases when risk of harm to yourself or others is disclosed, we will ask some questions and provide relevant support, to make sure you are kept safe.). To keep you safe, before your individual interview the researcher will ask for your location, this information will be destroyed after the interview if it is not required.

What the University wants you to know and who to contact

The data will be kept strictly confidential and be held in accordance with the General Data Protection Regulation 2018. Due to recent regulatory changes in the way that data are processed (General Data Protection Regulations 2018 and the Data Protection Act 2018), the University of Exeter's lawful basis to process personal data for the purposes of carrying out research is termed as a 'task in the public interest'. The University will endeavour to be transparent about its processing of your personal data and this information sheet should provide a clear explanation of this. If you do not have any queries about the University's processing of your personal data that cannot be resolved by the research team, further information may be obtained from the University's Data Protection Officer by emailing dataprotection@exeter.ac.uk or at www.exeter.ac.uk/dataprotection . If you have any concerns about how the data are controlled and managed for this study then you can also contact the Sponsor Representative, Pam Baxter, Senior Research Governance Officer: p.r.baxter2@exeter.ac.uk

Corona Virus

Due to the Covid-19 pandemic the interviews will be held via an online platform, Microsoft Teams or Skype for Business. Whilst this is thought to be a secure online platform, as with all online communication there is a risk that this may not be secure (e.g. that someone might be able to hear what we are saying if they 'hack' into the call. To mitigate this risk, the software used will meet University of Exeter ethics committee standards of encryption.

Transcription services

Devon Transcription Services will be used to transcribe some of the interviews. Devon Transcription Services maintain strict confidentiality measures as standardised by English law and covered by the Official Secrets Act. The service has a privacy policy which can be requested from the researchers. Alternatively, further details of their confidentiality can be found at https://www.devontranscription.co.uk/about-us.html .

What will happen to the results of this study?

I am a Trainee Clinical Psychologist and I am completing this research as a part of the Doctorate in Clinical Psychology at the University of Exeter. The results will be submitted as a doctoral thesis. We also share the finding of this research in an article for publication in a peer-reviewed journal and/or conference presentations. As part of this, no personally identifiable information will be presented. Direct quotes may be used but will be anonymised.

Who is organising and funding this study?

The study is funded by Public Health England as part of the doctorate in clinical psychology programme.

Who has reviewed this study?

This project has been reviewed by the Psychology Research Ethics Committee at the University of Exeter Reference NumbereCLESPsy000953.

Invitation to ask further questions

If you have any questions, please ask them now before signing the consent form. If during the study you have any questions please feel free to email Emily Broadbridge on ecb221@exeter.ac.uk. If you would like to take part in the study please complete and return the attached consent form.

What to do if you have concerns about the study

If, for any reason, you are not happy with any aspect of the studyand wish to complain please contact the project supervisors Dr Anke Karl or Dr Alicia Smith at a.smith@exeter.ac.uk.

If you have ethical queries please contact the CLES Psychology Ethics Chair, Nick Moberly at n.j.moberly@exeter.ac.uk

Thank you for your interest in this study.

Sources of support

Contacting health professionals:

A number of health professionals are able to offer help and advice to people troubled by extreme mood states or distressing thoughts and feelings. These include:

- **Your GP**. You can contact your GP to arrange an appointment, or in an emergency: most GP surgeries will connect you to an out-of-hours service if you call outside of office hours needing help. As a student you can contact Exeter University Student Health Centre, whether or not you are currently registered there:

Other sources of support / information:

- **Samaritans**: Samaritans provides confidential emotional support 24 hours a day. You can telephone them at any time or visit them in person between the hours given below.
    - 24 hour helpline: 116 123
    - Email help service: jo@samaritans.org
    - Website: http://www.samaritans.org

- **MIND** provides information about many topics related to mental distress. They can be contacted on 0845 766 0163

- The **Depression Alliance**. Information and advice about depression: www.depressionalliance.org.uk

- **Headway**- is a national charity helping individuals who have survived head injury. They have a helpline which is open Monday-Friday, 9-5 and local branches throughout the UK. Telephone- 0808 800 2244

- **National Domestic Violence Helpline** runs a 24/7 helpline, telephone 0808 2000 247

Appendix B

Consent Form

Title of Project: Creating a psychoeducation training programme for third sector organisation staff working with people who have experienced brain injuries due to domestic violence and abuse

Participant Identification Number:

Name of Researcher: Emily Broadbridge (Trainee Clinical Psychologist)

Please check the tick boxes (by clicking on the box) if you have read and agree to each point.

1. I confirm that I have read the information sheet dated 27.01.2021 (version no 1.1) for the above project. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
1. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without my legal rights being affected.	☐
2. I confirm that I understand that the web-based platform used for interviews may not be secure.	☐
3. I understand taking part involves an interview which will be audio-recorded and transcribed.	☐
4. I understand that audio transcripts of the interview will be deleted after downloading on to a secure server as will my paper consent forms (shredded).	☐
5. I understand my data will be kept strictly confidential and held in accordance with the GDPR (2018) and the Data Protection Act (2018).	☐
6. I understand confidentiality may need to be broken if I disclose a risk to myself or other people. The researcher will this disclose this information to their supervisor and the researchers will alert external agencies such as the police if	☐

appropriate to protect myself or others.	
7. I understand my data will be anonymised and my confidential personal information will be kept separately and destroyed once the data has been analysed.	☐
8. I understand that my personal information will be stored securely on an encrypted, password protected laptop on a secure server, and all electronic data including audio recordings, field notes and transcriptions of interview data will be given a unique participant number to protect my identity and confidentiality.	☐
9. I understand that the research data will be stored securely on a password-protected server with access to the files restricted to the research team. I have the right to have complete access to my data at any point in the research.	☐
10. I understand my' personal details and study data (linked to code) will be kept in different electronic locations such that someone who managed to access one would not be likely to find the other.	☐
11. I understand that after the research has finished, the anonymise data will be stored securely in line with university regulations for postgraduate study then destroyed by the chief investigator at the end of a seven-year period.	☐
12. I understand that I can withdraw my interview data up until the point of data analysis from the project (after 30 days). I understand that I will not be penalised for withdrawing my data, nor will I need to give a reason.	☐
13. I understand that my interview data may be transcribed by Devon Transcription service, I understand the procedures they will take to protect my data.	☐
14. I agree to take part in the study ‘Creating a psychoeducation training programme for third sector organisation staff working with people who have experienced brain injuries due to domestic violence and abuse’	☐

15. I would be happy to be contacted by the research team in the future to evaluate the training programme, once it is created.	YES ☐	NO ☐

____________________	____________________	____________________
Name of Participant	Date	Signature
____________________	____________________	____________________
Name of researcher taking consent	Date	Signature

When completed: 1 copy for participant; 1 copy for researcher/project file

If you have any queries at the end of the study, or you wish to discuss any of the events further you may contact the experimenters:

Emily Broadbridge- Ecb221@exeter.ac.uk

OR

Dr Alicia Smith (a.smith@exeter.ac.uk) or Dr Anke Karl (a.karl@exeter.ac.uk) (study supervisors)

Appendix C

Demographics Form

Demographic measure

Participant number……………………

Date………………………..

1. How would you define your expertise relevant to this research (please select all that apply)

Lived experience	
Academic expertise	
Health care expertise	
Social care expertise	
Other	

Please describe your area of knowledge or work in relation to domestic violence and brain injury:

…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………….

In terms of healthcare expertise, would you define this (select all that apply):

- Health consequences of DV

- Physical health (generally)
- Physical health in the context of DV
- Mental health (generally)
- Mental health in the context of DV
- Neuropsychology/neurorehabilitation (generally)
- Neuropsychology/neurorehabilitation in the context of DV

In terms of academic expertise, would you define this level as (select all that apply)

- Research Associate
- Lecturer or Senior Lecturer
- Associate Professor or Professor

In terms of social care expertise, what organisations have you worked in supporting survivors of domestic violence (select all that apply):

- local authorities - e.g. social services
- charity and voluntary organisations
- residential and non-residential care organisations
- prison service and probation services
- private or independent organisations
- schools, colleges and universities.
- health services - e.g. hospitals, mental health trusts, community based settings
- Other:

2. How many cumulative years of experience or expertise do you have in the field of domestic violence or brain injury?

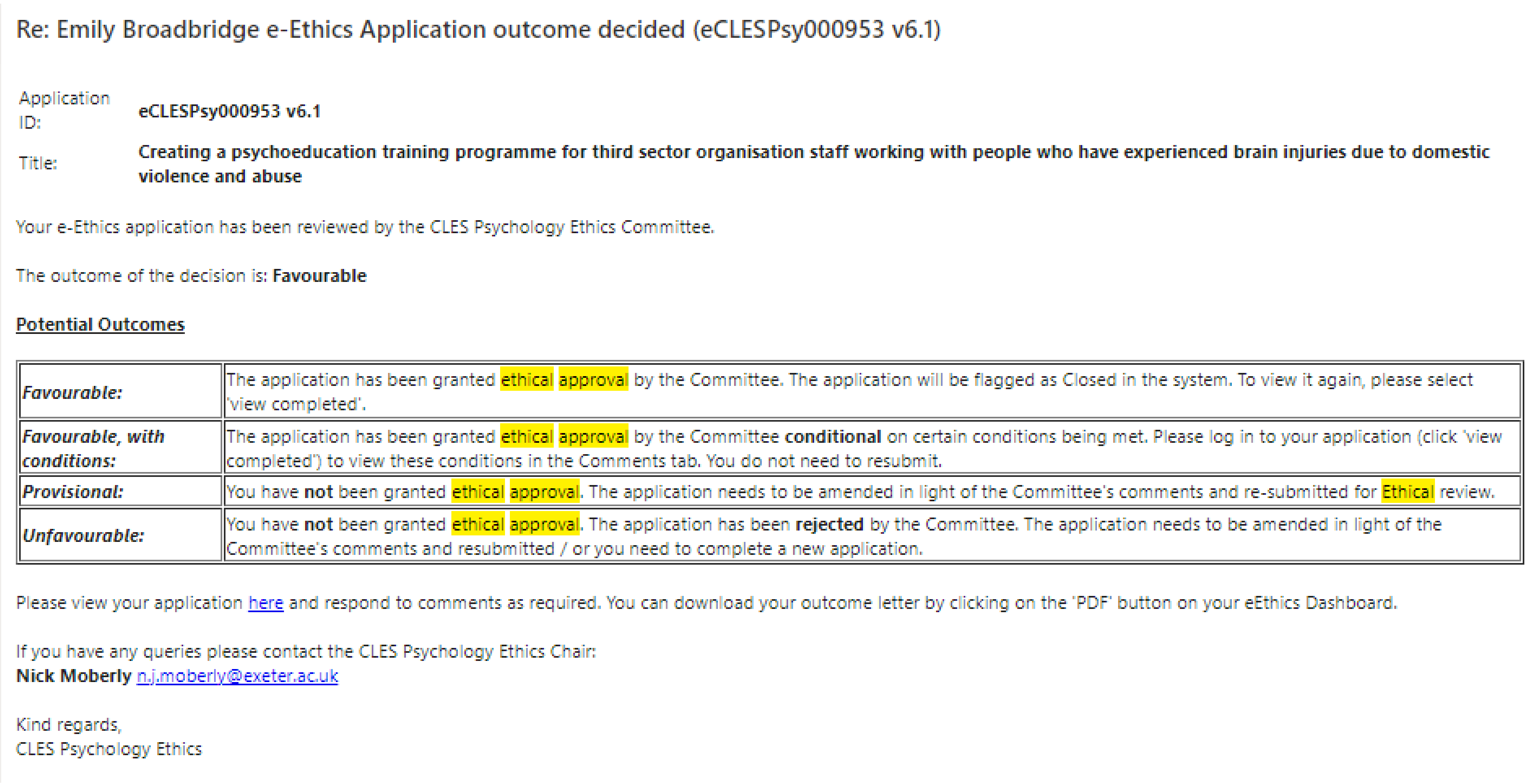
3. If applicable, what is your professional training? e.g. clinical psychology, medicine, occupational therapy etc.

…………………………………………………………………………………………………

4. Gender (self-define): …………………………………..
5. Age (years):……………………………….
6. Ethnicity (self-define): ………………………………………
7. Country of residence/occupation: ……………………………………………..

Appendix D

Ethical Approval



Re: Emily Broadbridge e-Ethics Application outcome decided (eCLESPsy000953 v6.1)

Application ID:	**eCLESPsy000953 v6.1**
Title:	**Creating a psychoeducation training programme for third sector organisation staff working with people who have experienced brain injuries due to domestic violence and abuse**

Your e-Ethics application has been reviewed by the CLES Psychology Ethics Committee.

The outcome of the decision is: **Favourable**

Potential Outcomes

Favourable:	The application has been granted ethical approval by the Committee. The application will be flagged as Closed in the system. To view it again, please select 'view completed'.
Favourable, with conditions:	The application has been granted ethical approval by the Committee **conditional** on certain conditions being met. Please log in to your application (click 'view completed') to view these conditions in the Comments tab. You do not need to resubmit.
Provisional:	You have **not** been granted ethical approval. The application needs to be amended in light of the Committee's comments and re-submitted for Ethical review.
Unfavourable:	You have **not** been granted ethical approval. The application has been **rejected** by the Committee. The application needs to be amended in light of the Committee's comments and resubmitted / or you need to complete a new application.

Please view your application here and respond to comments as required. You can download your outcome letter by clicking on the 'PDF' button on your eEthics Dashboard.

If you have any queries please contact the CLES Psychology Ethics Chair:
Nick Moberly n.j.moberly@exeter.ac.uk

Kind regards,
CLES Psychology Ethics

Appendix E

Debrief

Debrief- Participant Information Sheet

This sheet provides information about the study you have participated in and sources of support you might find helpful.

Study title: Creating a psychoeducation training programme for third sector organisation staff working with people who have experienced brain injuries due to domestic violence and abuse

Researcher name: Emily Broadbridge, Trainee Clinical Psychologist

What was the purpose of the research?

The purpose of the study was to make a training programme which focussed on the impact of brain injury from domestic violence. The training programme was to be delivered to third sector organisation staff, as they work with the most survivors of domestic violence and abuse, and therefore likely brain injury. We also wanted to be able to give recommendations about how the training could be delivered and evaluated (i.e. to find out how useful it is).

How did we do this?

To achieve this, we asked a number of people wo were either professionals working in the field of brain injury and/ or domestic violence and/or were experts by experience of domestic violence and brain injury. We interviewed everyone individually to find out what they thought should be included in the training. We also asked how people thought the training would be best delivered to third sector staff and how we could find out if it was useful. The researcher then made a draft training programme which will be published in a doctorate in clinical psychology thesis.

What happens now?

The aim of the study is to inform further research and ultimately help develop a training programme for individuals working in third sector organisations with survivors of Domestic violence who may have experienced brain injuries. We have asked you if you would like to be contacted in the future to see what you think of the proposed training programme.

What do I do if I feel upset?

If you feel upset or because of the study, below are listed a number of sources of support. You can also have a debrief telephone call with the researcher, to arrange this please email me at ecb221@exeter.ac.uk.

What do I do if I have questions?

If you wish to discuss the study further or have any concerns please contact Emily Broadbridge at ecb221@exeter.ac.uk or the study supervisor Dr Alicia Smith at a.smith@exeter.ac.uk.

If you have ethical queries please contact the CLES Psychology Ethics Chair, Nick Moberly at n.j.moberly@exeter.ac.uk

Thank you very much for participating in the study.

Sources of support

Contacting health professionals:

A number of health professionals are able to offer help and advice to people troubled by extreme mood states or distressing thoughts and feelings. These include:

- **Your GP**. You can contact your GP to arrange an appointment, or in an emergency: most GP surgeries will connect you to an out-of-hours service if you call outside of office hours needing help. As a student you can contact Exeter University Student Health Centre, whether or not you are currently registered there:

Other sources of support / information:

- **Samaritans**: Samaritans provides confidential emotional support 24 hours a day. You can telephone them at any time or visit them in person between the hours given below.
    - 24 hour helpline: 116 123
    - Email help service: jo@samaritans.org
    - Website: http://www.samaritans.org
- **MIND** provides information about many topics related to mental distress. They can be contacted on 0845 766 0163

- The **Depression Alliance**. Information and advice about depression: www.depressionalliance.org.uk

- **Headway-** is a national charity helping individuals who have survived head injury. They have a helpline which is open Monday-Friday, 9-5 and local branches throughout the UK. Telephone- 0808 800 2244

- **National Domestic Violence Helpline** runs a 24/7 helpline, telephone 0808 2000 247

Appendix F

Topic Guide

Table 3

Topic Guide

Topic	Guiding questions	Possible areas to explore (from the literature)	Possible follow up questions.
Warm up questions	Tell me about your work in the field of domestic violence and brain injury?	• History • Current work • Expertise • Motivation	What is your particular area of interest or expertise as you would define it? What is your motivation for doing this work? What are you currently focusing your work on in this topic? Can you tell me about your interest in the field of domestic violence and brain injury?
(Capability) Understanding the need for training?	How well do you think people understand the issue of brain injury in the context of domestic violence?	• Different perspectives • Current training • Benefits of training	- What might be some benefits of training staff about difficulties associated with brain injury as a result of domestic violence? - In your opinion, what issues about brain

			injury should be more widely known to help survivors of domestic violence? - Survivors, perpetrators, staff, broader society What training already exists for people to understand brain injury in domestic violence? What are the strengths/weaknesses of that training? How could training about brain injury improve the lives of domestic violence survivors? What kind of difficulties might a person with a brain injury have in interacting with professionals?
Knowledge	So, in thinking about the training package for third sector staff… What *key information* would be useful for people to know about brain injury in domestic violence survivors? What *other topics* should be included in the brain injury awareness training for DV staff?	- Brain injury - Domestic violence - Health outcomes mental health issues	- What information about *brain injury* is important to know? - What information about *health outcomes* of domestic violence is important to know? - What information about *health problems associated with brain injury* should be known? - What are the common problems that DV survivors with BI (diagnosed or undiagnosed) present with? - Are there any particular problems you think people should look out for? For

			example with communication, behaviour, cognition?
How can staff engage better?	How can staff best support survivors with health issues like brain injury? Relating to the above problems, what kind of things do you think staff would find useful to think about when changing how they interact with people with brain injuries?	- Help-seeking - communication - problem solving - goal setting	- What challenges to help-seeking to DV survivors have generally? - How can DV survivors be encouraged to seek help in relation to head trauma? - How can staff sensitively ask about head injuries? - what language or communication problems might be experienced and how to work with this? - How could staff work with survivors to support problem solving? - How could staff work with survivors to set relevant goals?
Training delivery method	What would be the ideal way to deliver brain injury awareness training to staff working with DV survivors?	- Context of training (e.g. culture of learning, supervision and line management) - Mode of delivery (e.g. online, in person) - Approach – individual or group - Access to expertise in neurology/neuropsychology), Ways include from literature - Face to face, - on the internet, - just written and sent out, interactive sessions, - group discussions, - role play, - simulation exercises	- In your opinion, what's the most effective way to offer training to staff working with DV survivors? - What way would the training ideally be delivered? - Would it be better to be delivered face to face or via online learning? - What take home materials would be useful to have from the training? - Could access to specialist professionals help the transfer of knowledge?

Evaluation	How could the training be evaluated?	- Acceptability - Knowledge gained - Staff behaviour change - Impact on DV survivors?	- How could we tell if people had gained knowledge from the training? - How would we tell if the training was useful? - How would we tell if it was helping people who come into services? - How would we tell if it were making things worse? - How would we tell if it were pitched at the right level?
AOB	Is there anything else you want to share to help develop this training programme?		
Thank you	Thank you so much for talking to me and sharing your views. I will send a debrief about this research project by email and sources of support sheet in case this interview has raised any issues for you. If you feel you need emotional support a we can do a debrief- you can email me anytime in the next 30 days		

Appendix G

Process of Reflexivity using Six-phase Framework

Table 4

Examples of reflexivity and reflexive response to data coding at each stage of coding, linked with six- phase framework for thematic analysis (Braun & Clarke, 2006)

Step of Six-phase Framework	Examples of reflexive noticing and responses

Step	Component	Description	Example summary of reflexive notes	Example reflexive response	Example
1	Become familiar with the data	Researcher reads and rereads the transcripts to become familiar with the data corpus and write down early impressions.	My reflexive notes focused on participants emotions such as passion and anger. I became stuck on one thought which was that participants felt that creating a training resource was not appropriate as first organizational connections and changes need to be made.	I worried project was not right and that I should stop interviewing. I spoke to supervisors who advised keep interviewing and begin coding to better understand nuanced meanings, this provided focus.	"*you could produce an affordable, high-quality training course around brain injury and domestic violence, and it will just sit in a cupboard or on a computer somewhere because it's not getting out to the people who actually need it*." -P3
2	Generate initial codes	Organise data in systematic, meaningful way by coding data into chunks of meaning for example how they relate to the research questions.	I initially used descriptive codes. This led me to be really confused about the meaning of certain codes as my assumptions and experience whilst engaging with the data changed the way I was coding and interpreting data. Reflexively I felt I was missing potential important nuances of context from participants responses. For example, the context was talking about girls in sport rather than domestic violence and abuse.	Reviewed literature and discussed with course tutor and recoded using in-vivo line by line coding.	"*That led me to see this anomaly of girls being brought to the clinic much later than boys or not even brought to the clinic."*- P1 Initially coded as 'sex differences' and then recoded as "*anomaly of girls being brought to the clinic much later than boys"* *And* *"[girls] not even brought to*

					the clinic"
3	Search for themes	Define themes or 'patterns' within the data. These are themes which are particularly significant or interesting in relation to the data and the research questions.	Themes were initially defined by using participants language and my own. I noticed there were themes which particularly grabbed me for example screening for BI was felt to be essential, I noticed that participants felt quite differently about how this should be approached and by whom. I noticed that in relation to the research question that although this felt to me like it could be the whole training it was as a part of the larger context being recommended by participants.	Screening was initially a theme and was recategorized as a sub theme into another theme 'things that can help'.	*"Just ask the damn question"*– P1 *"If you are screening for something, we have to have something effective to offer*." -P9
4	Review themes	Review, modify and further develop the preliminary themes identified in step 3. Gather all data relating to the themes and ensure the data supports the themes identified.	Codes and themes were reviewed by uninterested third party (qualitative researcher and clinical psychologist) who noticed that grouping of codes in themes were not self-explanatory, for example, needed explanations as to context.	Themes and subthemes were reorganised and were carefully constructed using participants language to categorise themes to increase transparency of coding and themes.	For example: '*Sex differences (descriptive)*' was recoded using participants language of 'sexism and discrimination' and subthemes were included such as *'if you're female, there is an expectation around your level of communication'* And *'why aren't women in your*

					research’ Into which initial codes were organised.
5	Define themes	Define themes to ‘identify the ‘essence’ of what each theme is about’ (Braun & Clarke, 2006, p.92). Consider how the themes relate to one another, any subthemes, and are there overarching themes.	I reviewed the themes and contained codes again and again to ‘identify the ‘essence’ of what each theme is about’. I felt that the themes were comprehensive however review by an uninterested third party highlighted that the descriptions of the themes did not perfectly summarize the contained sub themes. I was very adverse to changing these and I noticed that was because I felt strongly that the participants words should be used instead of mine to increase trustworthiness.	I returned to Braun and Clarke’s literature about reflexive thematic analysis and emersed myself in its essence. I realigned myself with the RTA principles of co-constructed themes and realized that I needed to use my own words to better present my data to be understandable to all.	‘*The meat and potatoes, the most important aspects’* (participant language) was renamed “*Specified educational needs of practitioners”* (my language to summarise theme)
6	Write up	Write up the results for the dclin thesis.	In writing up the thesis I noticed I wanted to include all the information the participants had given about each theme and felt annoyed that I could not.	Discussion with supervisors and tutor TA group and examiner feedback. The group aided my reflexivity in noticing that I needed to write to the aims of the project and guiding questions, this helped me prioritise what data to include in the write up.	I felt that much information about what needed to be included in training and evaluation was needed in the write up and appendix. To streamline the findings appendix were removed and instead concisely summarized in the analysis.

Appendix H

Manuscript Submission Guidelines for the Journal of Interpersonal Violence

https://journals.sagepub.com/author-instructions/JIV

Appendix I

Dissemination statement

The results of this study will be disseminated to interested parties through feedback, journal publication and presentation.

Dissemination to participants and NHS services.

As stated on the participant information sheet participants will be informed of the results of the study. Participants will be provided with details of who to contact, should they require further information. Additionally all participants involved in the research will be provided with a summary of the findings. The NHS research ethics committee at Exeter and RD&E Research and Development team will be sent a summary of the findings of the study and will be informed that the study is now complete.

Journal Publication

It is expected that the study will be submitted for publication with Journal of Interpersonal Violence (impact factor 3.573).

Presentation

On 28th June 2021, my research findings were presented to an academic audience, for peer review, as part of the Doctorate in Clinical Psychology at the University of Exeter.