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Interventions for Adjustment, Impaired Self-Awareness, and Empathy

Hamish J McLeod
Fiona Ashworth
Tom McMillan

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Psychological therapy can have an important role in successful neurobehavioural rehabilitation, but there is a need for improved understanding of mechanisms of change, combined with a substantial increase in the quality of the primary outcome evidence base (McMillan, 2013). The need for improved treatments is exemplified by the long shadow cast by poor emotional adjustment and impaired interpersonal relationship skills commonly experienced after traumatic brain injury (TBI). This chapter provides an analysis of the issues that require attention with respect to adjustment, self-awareness and empathy, and the evidence for psychological interventions. We finish by presenting potentially fruitful areas for future development.

An Unmet Treatment Need

Psychological problems following TBI can continue long after acute medical issues and physical disability has resolved. A key issue in psychological recovery is adjustment to life changes, including social roles. Indeed, it is common, late after injury, for relatives to comment that whilst there has been little change in impairment severity, the person with TBI, as well as the family, have adapted to a change in lifestyle and learned to avoid situations which provoke socially challenging behaviour. This process might take years (Wood & Rutterford, 2006) during which there may be the breakdown of social relationships and employment (See Kreutzer et al this volume). Following the injury, poor adjustment can limit engagement in, and hence the effectiveness of, neurorehabilitation (Ownsworth & Clare 2006). Limited adjustment can be associated with denial ('I am not impaired as a result of the brain injury') or expressed as poor judgement ('I am impaired as a result of the brain injury, but I can return to work next week'). Together with impaired empathy, denial can often place a substantial strain on relationships via fundamental changes in the way in which the person regulates their own behaviour and relates to others. Previously warm and engaging people may suddenly seem uncaring, disengaged, abrupt, self-absorbed and lacking remorse. They may become a source of stress and worry because of their poor judgement and erratic regulation of previously manageable social and behavioural roles (Vaishnavi, Rao, & Fann, 2009).

The loss of social roles following brain injury can be associated with fundamental changes in self-concept that in turn can be associated with severe anxiety and depression. This picture is further complicated by the high incidence of pre-injury psychiatric disorders in those with TBI (Bombardier et al., 2010; Jorge & Robinson, 2003). Psychological factors such as mood and self-esteem have also

been found to predict changes in disability late after injury (SIGN, 2013). These aspects highlight the complexity of psychological difficulties that can arise when individuals struggle to adjust to their new circumstances following brain injury.

The central importance of adjustment and self-awareness to a good recovery and the successful outcome of neurobehavioural interventions have long been recognised. Restoration of impaired identity of self, via compensatory strategies and adjustment, was seen as key to successful rehabilitation in early work by Goldstein (see McMillan 2013). Sadly, these problems with psychological functioning have not stimulated the development of a coherent array of evidence-based treatment options. This makes it hard to specify effective treatment strategies and to develop new, more efficient, effective, and scaleable complex interventions (Craig et al., 2008; Moore, Audrey, Barker, Bond, Bonnell, et al., 2015b). As an example, the data to guide psychological treatment of depression following TBI is so limited that treatment guidelines have not been able to stipulate an empirically supported approach (SIGN, 2013). The evidence for managing anxiety disorders after brain injury is not much better except for limited evidence that CBT is indicated for acute stress disorder and the recommendation that CBT should be part of a holistic rehabilitation programme (SIGN, 2013; Soo & Tate, 2007). These are substantial limitations as lower levels of emotional distress are a particularly strong predictor of favourable post-injury outcome (Schonberger et al., 2014). If this association between adjustment, awareness, emotional disturbance and recovery is modifiable by psychological therapy, then there is great potential for improving outcomes for a currently neglected group.

The Need for Targeted Treatments

Among the many possible reasons for low penetration of psychological interventions in post-TBI recovery is the fact that a substantial proportion of patients display awareness and motivational problems that directly impede help seeking and treatment engagement (Flashman & McAllister, 2002; Pagulayan, Temkin, Machamer, & Dikman, 2007). Some may exhibit general problems in thinking about the mental states of others (i.e. their capacity for theory of mind is degraded; (Bibby & McDonald, 2005) or they may experience specific impairments in understanding the emotional needs of others (Hooker, Verosky, Germine, Knight, & D'Esposito, 2008). These problems with self-awareness and insight are well recognised following TBI (Ownsworth et al., 2007) but treatment guidelines are largely silent about the best way to respond therapeutically to these needs because of a lack of evidence (SIGN, 2013). This may in part arise from the fact that impaired awareness can take different forms. To complicate matters, being more aware of difficulties can induce depression in some cases (Malec, Testa, Rush, Brown, & Moessner, 2007) whereas denial can reflect the use of unproductive avoidant coping strategies that may superficially appear to be protective but actually elevates the risk of depression (Kortte, Wegener, & Chwalisz, 2003).

The need to adapt standard psychological therapies to take account of cognitive impairments is already an acknowledged need (Block & West, 2013; Bornhofen

& McDonald, 2008) but we also have to learn more about the specific therapeutic mechanisms and techniques that yield the greatest benefits for problems of psychological adjustment, empathy, or self-awareness after TBI.

The following is a selective review of the treatment outcome literature where psychological therapies have been applied to psychological adjustment, awareness, or empathy, either alone or in combination. Each study is described in terms of design and type of treatment, patient characteristics, treatment parameters, main outcome and further findings.

An Overview of Treatment Studies

The three summary tables below bring together key studies addressing problems of awareness (Table 1); studies targeting post-injury emotional and psychological adjustment (Table 2); and trials that address deficits in empathy and problems representing the mental and emotional state of others (Table 3). Studies on acquired brain injury of various aetiologies are included given the paucity of studies on TBI and together they represent data on 252 people. The studies range from single cases to large samples (N= 71), with most reporting data on small groups of 10 to 20 participants. These small sample sizes are likely to be a major contributor to the lack of clear cut effects across trials. Broadly there are six distinguishable therapeutic approaches in the 12 studies:

- compassion focused therapy
- supportive psychotherapy
- Cognitive Behaviour Therapy
- metacognitive skills and awareness training
- facial emotion discrimination training
- emotion and mental state discrimination training using written vignettes

The modes of treatment delivery included groups, conventional individual therapy, computer-based approaches with therapist support, and augmented rehabilitation approaches where scaffolding and problem-solving coaching were provided to help with the completion of practical tasks. The delivery settings varied between inpatient and outpatient care in a mixture of public health service and university research centres across high income countries. Of the target domains, the biggest range of data and largest number of studies addressed empathic awareness and the decoding of emotional and mental states in others. This appears to be an area of substantial activity in recent times.

Study	Design and Type of Treatment	Patient characteristics	Main Outcomes	Treatment Parameters	Findings and observations
Cheng & Man (2006)	Pre-post comparison design with random allocation in referral sequence. Awareness Intervention Training versus "Conventional Rehabilitation"	21 adults receiving inpatient TBI rehabilitation (index injury severity not stated) 11:10 experimental vs. control conditions	Self awareness of deficits Functional independence Activities of daily living	Individual sessions delivered at two 20-30 minute sessions per day, up to five days per week for four weeks. Interventions targeted self-knowledge of deficits, awareness of changed abilities, goal setting and task regulation practice. Modalities of training involved psychoeducation and copious task related feedback.	Awareness scores improved for the experimental group but no difference was observed for functioning scores. Total potential dose amounts to 40 sessions of treatment, about 20 hours of contact.
Goverover et al. (2007)	RCT Awareness training added to ADL skills training using structured tasks (e.g. packing a lunchbox; paying a bill)	20 community patients with mild-moderate ABI of various aetiologies. 10:10 treatment vs. control	General and task specific awareness ADL performance Self regulation skills	6 sessions of <45 minutes delivered over 3 weeks. Awareness training recipients got task relevant feedback, prompting, scaffolding, and help with problem solving	Active condition patients showed superior functional performance and self-regulation skills compared to controls. Between group changes in task specific self-awareness did not reach significance.

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Study	Design and Type of Treatment	Patient characteristics	Main Outcomes	Treatment Parameters	Findings and observations
Ashworth et al. (2011)	Single <i>n</i> case report with calculation of RCI. Patient received CFT embedded within a holistic neuropsychological rehabilitation centre	23 year old woman who suffered a severe TBI in a RTA.	Self-reported depression, anxiety, anger, and self concept	The initial 6 sessions used CBT formulation and techniques but following a reformulation to address self-criticism the remaining 18 sessions focused on CFT techniques.	RCI was observed for pre-post improvement in anxiety, depression, and self-concept.
Ashworth (2014)	Single <i>n</i> case report with calculation of RCI. Patient received individual CFT.	29 year old man who suffered a severe TBI in a RTA	Self-reported depression, anxiety, self-criticism/attacking, and self-reassurance	Individual CFT (16 sessions) delivered over 3 months. Session content based on CFT principles aimed at addressing underlying self-criticism/attacking.	RCI was observed for pre-post improvement in anxiety, depression. Pre-post treatment reduction in self-criticism/attacking and increase in self-reassurance.
Ashworth et al. (2014)	Mixed methods naturalistic uncontrolled design. Compassion Focused Therapy (CFT)	12 patients with ABIs from various aetiologies enrolled in an 18-week outpatient neuropsychological rehabilitation	Pre-post treatment change in anxiety, depression, self-criticism/attacking, and self-reassurance plus 3 month follow-up.	Individual CFT (mean = 16 sessions) and “mood group” run on CFT principles (4 sessions) embedded within a comprehensive holistic	Pre-post treatment reductions were observed in anxiety, depression, self-criticism, and self hatred and these were

		programme.		rehabilitation programme.	sustained at 3 month follow-up for retained patients (n=9).
Hofer et al. (2010)	Uncontrolled within subjects pre-post evaluation of change. Treatment was described as general psychotherapy with an emphasis on improving coping with the emotional consequences of acquired brain injury.	11 patients with moderate to severe ABI of traumatic or vascular aetiologies who met DSM criteria for Adjustment Disorder.	Self rated depression and coping skills	Treatment followed a period of intensive inpatient and/or outpatient neuropsychological rehabilitation. Phases of treatment included promoting acceptance, reconstructing self-image, finding new meaning, and setting goals. Participants received an average of 23 sessions (range 9-30) over a period of 12 to 18 months.	6 patients returned a significant RCI for improvement in depression scores. Significant group level improvements were seen for depression and self-reported coping.
Ashman et al. (2014)	RCT of CBT (n=22) versus Supportive Psychotherapy (SPT) (n=21)	43 patients with head injury ranging from mild-moderate to severe completed treatment who met DSM criteria for depressive mood disorder and/or had a baseline BDI score over 20.	Remission of depression and pre-post treatment reduction in BDI score.	16 individual sessions delivered over 3 months. Treatment session content was guided by written manuals for each arm of the trial.	Both treatment groups displayed pre-post reductions in depression symptoms. 35% of the CBT group and 17% of the SPT group achieved full remission at the end of treatment (no statistically significant difference).

Notes

RCI – Reliable Change Index; RCT – Randomised Controlled Trial; BDI – Beck Depression Inventory; ABI – Acquired Brain Injury; DSM – American Psychiatric Association Diagnostic and Statistical Manual

Table 3 <i>Empathy focused intervention studies</i>					
Study	Design and Type of Treatment	Patient characteristics	Main Outcomes	Treatment Parameters	Findings and observations
Radice-Neumann et al. (2009)	RCT Comparison of Facial Affect Recognition (FAR) training versus Emotional Processing from Written context training	19 patients with ABI from traumatic causes	Affect recognition from visual and written stimuli, adaptive functioning	Affect recognition involved training sensitivity to affect displays in others and awareness of ones own emotions. Social emotional training involved guided processing of written stories. Training was provided 3 times per week for up to 3 weeks for both conditions (average 6.5 days for both conditions)	Facial affect recognition training was associated with broader improvements in social emotional information processing.
Bornhofen et al (2008a)	RCT (active treatment vs. waitlist control) with multiple baseline measurement and one month follow-up.	11 outpatients with severe TBI and clinical evidence of social awkwardness or interpersonal difficulties.	Accurately labelling emotions in static photos and video clips. Social functioning.	25 hours of training across 8 weeks. Hierarchically structured tasks beginning with simple discrimination of	Treated patients showed greater ability to detect emotional deviations from neutral expressions and to

	Treatment involved teaching emotion processing and discrimination skills.	5:6 Active treatment vs. waitlist control		emotion states and working up to more complex dynamic judgements and shaping of self-instructional training. Errorless learning procedures were employed.	accurately discriminate between emotional states in an other. No effect for psychosocial functioning. Improvements were durable over one month follow-up.
Bornhofen et al. (2008b)	RCT with two treatment arms (self instructional training vs. errorless learning) and waitlist control with one month and 6 month follow-ups. Initial allocation was 6 participants to each arm.	18 outpatients who had suffered a severe TBI more than 6 months previously and were reported to have social functioning difficulties (e.g. apparent difficulty processing social cues)	Static (photos) and dynamic (videos) facial affect processing plus assessment of ability to make accurate social inferences. Self reported psychosocial functioning, depression, and anxiety.	Weekly 2.5 hour treatment sessions for 10 weeks. Therapy procedures were manualised to promote consistency.	Both intervention arms showed improvements in discrimination of facial emotions and inferring emotional cues from context. Self instructional training was showed signs of being superior.
O'Neill & McMillan (2012)	Between groups repeated measures comparison of compassionate imagery versus relaxation training on empathy as the main outcome. Allocation to condition was randomised.	24 inpatients with severe head injury and problems with social-emotional information processing.	Empathy quotient, fear of compassion, self-compassion, and self-rated relaxation scores.	Compassionate Imagery training or Relaxation Training was delivered individually in a single 30-minute session according to a scripted protocol that ensured uniformity for both groups.	No significant effects were observed for empathy, subjective relaxation or fear of compassion. A trend toward improved self-compassion was observed for both groups (p=.07).
Neumann et al (2015)	Multisite RCT with two experimental treatment arms (face processing	71 patients with moderate to severe TBI incurred more than one	Pre-specified primary outcomes were facial affect recognition and	Therapist supported computer delivered training in 9 one hour	Facial emotional information processing was significantly better

	training or social story processing training) or a comparison treatment (non-social cognitive brain training online games). Outcomes were assessed at post-treatment, 3 and 6 month follow-up.	year previously who had significant problems with facial information processing.	emotional inference from written stories. Empathy was assessed as a secondary outcome.	sessions three times per week for three weeks.	for patients who received the face processing intervention and this effect was durable over 6 month follow up. These effects did not generalise to processing social stories.

Main Findings and Outcomes

These studies provide some indications of the positive outcomes that can be achieved for problems with empathy, adjustment, or awareness following TBI or acquired brain injury more generally. But, further work is required to refine and validate treatment options given the conflicting findings and methodological weaknesses of the studies.

There are contradictory findings across the two trials that primarily focused on improving awareness. Both used strategies that could be considered to be metacognitive, in that the participants were helped to take an observer perspective on their actions and use this awareness to adopt more effective behavioural choices. Despite these similarities in general approach, one study reported enhanced awareness and no functional behavioural change (Cheng & Man, 2006), while the other showed improvement in functioning with no awareness changes (Goverover, Johnston, Toglia, & DeLuca, 2007).

The five studies that addressed post-injury psychological adjustment (Table 2) used CBT, compassion focused therapy (CFT), or supportive psychotherapy to target self-understanding and processing of emotions after TBI. Interestingly, the description of the treatment techniques and the rationale across the studies suggests a unifying theme of promoting self-understanding and self-acceptance. In the case of CFT, these outcomes are shaped via compassionate mind training as an antidote to self-criticism, self-attack, and coldness towards the post-injury self. Although the CFT studies outlined here addressed anxiety and depression, the therapy also aims to develop the different elements of compassion within oneself, including empathy. The results of these five studies suggest that the therapy techniques had some beneficial effect on emotional adjustment as found in depressive symptom scores. There are also hints that these approaches are associated with durable effects on other emotional outcomes such as reduced anxiety, as well as secondary appraisal processes, such as reduced self-attack and improved coping. The main problem when interpreting these studies is the use of uncontrolled designs, which means that change might be attributable to non-specific therapeutic factors such as therapist attention and support (Mansell, 2011). Also, the relatively weak experimental designs allow little scope for inferring mechanisms of change.

The final set of studies includes examples of programmatic research that attempts to replicate and build on findings across a series of studies. These five studies share a “dismantling” approach where elements of an intervention are identified and then systematically tested relative to other elements. As these elements are likely to be germane to the content of holistic rehabilitation, this approach begins to address a major limitation in the psychotherapy literature - that psychotherapeutically active ingredients of holistic rehabilitation are rarely empirically assessed (see Chapter x Prigatano). The main finding in four of the five studies addressing empathic awareness is that the ability of people with TBI to discriminate emotional states from visual-facial cues can be improved and these effects can be durable over time. What is less clear is whether training in

one modality (e.g. using written vignettes describing socioemotional information) can generalise to fluent processing in another stimulus category (e.g. face cue discrimination) and whether those skills generalise to produce improvements in social relations (see Chapter X Williams and Wood).

Analysis of Intervention Techniques and Strategies

The foregoing description of intervention studies highlights a few key patterns that characterise the wider TBI treatment literature. First, there is considerable variation in the general approach to selecting therapeutic strategies. Three studies imported protocols that were based on a broad psychological therapy model (e.g. CBT or CFT) and investigated whether the treatment works for people with TBI. This “package” driven approach is common in the history of psychological interventions such as CBT, whereby protocols were tested for efficacy across an increasing array of diagnoses and clinical populations (Butler, Chapman, Forman, & Beck, 2006). The other main approach has been to apply a technique or strategy that focusses on a proposed mediator of a clinical problem. This kind of study attempts to tie the therapeutic intervention very clearly to a putative mechanism that could explain the cause and/or maintenance of a problem (e.g. improving facial affect recognition skills to reduce insensitive behaviour arising from low empathy). However, the mixed findings suggest a remaining need for a more fundamental re-consideration of the techniques and strategies used to help people with TBI overcome problems arising from poor empathy, unawareness, or difficulties of adjustment. The problem is not a fundamental lack of viable techniques and strategies, but rather an insufficient momentum and coordination of research effort. This presents an opportunity to specify parameters that should support the development of more effective TBI interventions. Fortunately, recent efforts aimed at improving an understanding of the development and implementation of complex interventions have led to approaches that can be useful in producing more effective interventions for problems with adjustment, empathy, and/or awareness after TBI.

Building More Effective Complex Interventions

The past two decades have seen a more systematic approach to understanding how complex interventions work in mental health and why they are sometimes difficult to implement at scale across a variety of contexts. This work was stimulated by the frequently observed problem that efficacious treatments may be endorsed in clinical standards and guidelines but are then used rarely in “routine” clinical services (Haddock et al., 2014). Recognition of this problem stimulated the development of guidance frameworks for treatment developers to enable them to plan to determine not only whether a complex intervention is efficacious, but also how it can be transferred into routine care (Murray et al., 2010). The need for this kind of systematic approach for TBI is evident given the lack of data on effective psychosocial treatments (SIGN, 2013); Matrix 2015; Cicerone et al 2011) and presents an opportunity to focus on the development of therapy protocols that can be delivered at scale and taught to “real world” clinicians (Hogue, Ozechowski, & Robbins, 2013; Sholomskas et al., 2005; Singla et al., 2014). An initial step will be to analyse promising interventions in a way

that promotes a better understanding of mechanisms of change and a more targeted approach that maps interventions to needs (e.g. (Michie & van Stralen, 2011)). A strong theory-informed approach to psychological treatment development that targets specific symptoms and underlying processes can reduce the interpretative problems that arise by continuing to add elements into already complicated protocols. The following quote captures the problem: “Multi-element packages are often loosely bound having the quality of collections of elements. As new manuals are written they combine elements of older packages, mixed together into a kind of technological stew”. (Hayes, Long, Levin, & Follette, 2013) p. 873). To ensure that psychological therapies remain an important contributor to neurobehavioural rehabilitation, there is a need to focus the evaluation of treatment trials, not just on broad outcomes, but also on mechanisms of change.

Capability, Opportunity, and Motivation as Key Factors in Psychosocial Treatments following TBI

A major element of psychological therapy focusses on behaviour change that promotes adaptive functioning and improved wellbeing. However, achieving durable change that persists across contexts, and continues after active treatment has been withdrawn, can be challenging. One response to this challenge is to develop explicit models of how these various change elements fit together. As an example, Susan Michie and colleagues developed the COM-B model. This proposes that behaviour change is influenced by three key factors: 1. Physical and psychological capabilities (e.g. skills and knowledge that need to be learned, consolidated, or amplified); 2. Motivational factors (both automatic and consciously represented); and 3. The repeated creation of opportunities to engage in, and rehearse, the target behaviour (see (Michie & van Stralen, 2011) for a full description and rationale for this approach). The intervention studies reviewed above typically address some, but not all of these elements (e.g. skills may be taught but not linked to salient motivational factors). This tendency for TBI treatment packages to incompletely address all key areas of behaviour change might explain some of the observed problems with treatment generalisation and durability.

Problems with generalisation of treatment-effects is a major issue for many focused psychological interventions, especially for people experiencing cognitive impairments (Cella, Reeder, & Wykes, 2015). This highlights a complicated but important need in the development of interventions for recovery from TBI; the creation of motivational salience that can sustain behaviour change once active intervention is withdrawn or phased out. Some interventions target motivational salience implicitly (e.g. via conditioning processes) while others attempt to increase conscious awareness of the rewarding feelings associated with achieving desired goal outcomes (e.g. (Cheng & Man, 2006; Hofer, Holtforth, Frischknecht, & Znoj, 2010). Some third wave CBT strategies such as Acceptance and Commitment Therapy (ACT) augment goal setting by adding a deliberate focus on the clarification and pursuit of personal values that can be used to organise behavioural choices and persistence in the face of challenges (Whiting, Simpson, McLeod, Deane, & Ciarrochi, 2012). The benefits of this approach to

generalisation of outcomes is yet to be demonstrated under trial conditions, but there are theoretical arguments that support the use of ACT as an intervention to address psychological adjustment after TBI (Kangas & McDonald, 2011; Soo, Tate, & Lane-Brown, 2011). However, the evidence that many interventions show inconsistent outcomes, erratic generalisation, and mixed acceptability to patients suggests that a substantial amount of work on tapping the salient motivational processes is needed to provide the momentum for lasting behavioural change (see Kring & Barch, 2014) for a discussion of parallel issues relevant to improving motivation in people with schizophrenia).

Known Unknowns and the Future Development of Psychological Therapy for Awareness, Empathy and Adjustment

Given the costs associated with persistent disability and the expense of multimodal holistic treatment approaches, there are economic and quality of life benefits from improving design, evaluation, dissemination, and delivery of focused psychological interventions for TBI. But, there are many unknowns. For example, the impact of acquired neurocognitive deficits on the capacity to utilise psychological interventions is an area of substantial challenge (e.g. Doering & Exner, 2011). One common assumption is that there is a need to adapt psychological interventions in order to accommodate problems with memory, attention, and concentration but the evidence base to guide such adaptations is very limited (Block & West, 2013). None of the studies reviewed above shed light on whether the capacity to benefit from therapy for low awareness, empathy and emotional adjustment is strongly affected by neurocognitive deficits. A planned approach to describing and measuring adjustments to the therapy process should help identify which adaptations give the most benefit for the greatest number of patients (e.g. improving the description and analysis of what happens in sessions will help to distil and describe key mechanisms of change; see (Forman, Chapman, Herbert, & Goetter, 2012) for an example).

Conclusion

Psychological intervention studies highlight innovative work aimed at improving outcomes for people experiencing problems with adjustment, empathy, or awareness following TBI. But, the evidence for treatment effectiveness is very limited and generalisation of treatment effects is generally poor. There has been insufficient attention to the motivational factors that can have an impact on the durability of behavioural change over time. These issues have been confronted in the psychological treatment of other complex problems (e.g. psychosis) and there is hope that beneficial outcomes can be achieved for TBI despite the challenges of severe symptoms, concomitant cognitive impairment, and significant loss of social functioning. But, like the lessons learned from other applied areas of psychological intervention, there is need to take a systematic approach to understanding mechanisms of change and to view the treatments for TBI in terms of complex intervention development (Hayes et al., 2013; Moore, Audrey, Barker, Bond, Bonell, et al., 2015a; Moore, Audrey, Barker, Bond, Bonnell, et al., 2015b).

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