

VOLUME ONE: RESEARCH COMPONENT

MINDFULNESS AND MEDITATION IN FORENSIC CLINICAL PSYCHOLOGY

by

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Thesis Overview

This thesis consists of two volumes submitted towards the Doctorate in Forensic Clinical Psychology.

Volume I comprises three research chapters. The first chapter presents a systematic review of the literature exploring meditative approaches in correctional settings. A number of meditation and mindfulness approaches are discussed in relation to psychological and physical wellbeing, criminogenic needs, and recidivism in offender populations. The second chapter is an empirical research study which sought to validate a measure of a Buddhist-derived concept of mindfulness, insight, in a UK undergraduate university sample. The third chapter is a public dissemination document which provides a brief and accessible overview of the review and empirical components.

Volume II comprises five forensic clinical practice reports. The first presents the case of Paul¹, a 22-year-old male presenting with verbal and physical aggression, formulated from two psychological models. The second presents a service evaluation of the involvement of service users in the care planning process in a secure inpatient hospital. The third presents a single-case experimental design of the case of Jane¹, a 22-year-old female with a mild learning disability and a suspected autistic spectrum condition, presenting with anxiety relating to pregnancy and motherhood. The fourth presents the case of Claire¹, a 17-year-old female experiencing symptoms of low mood, anger, and difficulties in her relationship with her mother. The fifth presents an abstract of an oral presentation about the case of John¹, a 34-year-old male serving an IPP sentence in a Category B prison, presenting with frequent self-harming behaviour.

¹ All names have been changed to maintain confidentiality.

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CHAPTER 1

LITERATURE REVIEW

A SYSTEMATIC REVIEW OF MEDITATIVE APPROACHES TO IMPROVING WELLBEING, TARGETING CRIMINOGENIC NEEDS AND REDUCING RECIDIVISM IN CORRECTIONAL SETTINGS

Abstract

Background

With the prison population increasing, safety in prisons declining, and the increase in mental health and substance misuse issues in the prison population, there is a need to offer effective interventions to target these issues and help to lower recidivism. In the past, research has explored whether meditation can help to address these issues in offender populations. The aim of this review was to bring together this research to assess the quality of this research and to see whether meditation has shown to be effective in improving wellbeing and reducing recidivism in prisoner populations.

Method

A search of the literature resulted in 21 studies being reviewed using the Quality Assessment Tool for Quantitative Studies.

Findings

5 studies were rated as 'strong', 3 studies were rated as 'moderate', and 13 studies were rated as 'weak'. Meditation was found to improve psychological wellbeing (e.g. reduce anxiety, depression, stress and trauma-related symptoms), physical wellbeing (e.g., improve sleep), target criminogenic needs (e.g., anger, self-esteem, impulsivity and substance misuse), and to reduce recidivism. However two studies also found that meditation may have led to increases in self-judgement and shame, and that prisoners who meditated for less than 4 weeks reported lower self-esteem and self-compassion than prisoners who did not meditate.

Conclusions

Whilst meditation approaches have shown to be beneficial in offender populations in terms of improving psychological and physical wellbeing, targeting criminogenic needs and reducing recidivism rates, 61.9% of the studies were rated as 'weak' in the overall quality of the research that was conducted. Further high quality research is therefore recommended to confirm the findings from the studies included in this review, as well as exploring potential adverse effects for prisoners engaging in meditation in correctional settings that may lead to a deterioration in psychological and/or physical wellbeing or increase the risk of recidivism.

Introduction

The world prison population is rising, with 10.74 million people recorded as being held in penal institutions around the world in 2018, which is a 24% increase since 2000. With the world prison population rate being estimated at 145 per 100,000, the Americas' prison population rate (376 per 100,000) and Europe's prison population rate (187 per 100,000) are two of the highest rates of imprisonment in the world (Walmsley, 2018).

In England and Wales, over the past 25 years the prison population has grown significantly from 44,246 in 1993 to 82,384 as at 2018, which has been largely attributed to a greater proportion of individuals convicted of an offence being given a custodial sentence, and custodial sentences becoming longer (Justice Committee, 2019).

Safety in Prisons

Safety in prisons has been acknowledged as rapidly deteriorating during the last seven years in England and Wales (Prison Reform Trust, 2019). The most recent Safety in Custody Statistics for England and Wales (Ministry of Justice, 2020a) showed that:

- In the 12 months to March 2020, there were 286 deaths in prison custody. Of these, 80 deaths were self-inflicted, which is a 36% increase since 2010, and 3 were homicides.
- Self-harm incidents reached a record high of 63,328 incidents in the 12 months to December 2019, up 14% from the previous 12 months. Between December 2018 and December 2019, the number of individuals self-harming increased by 3% from 12,573

to 12,977 and the number of self-harm incidents per individual increased by 11% from 4.4 to 4.9.

- There were 32,669 assault incidents in the 12 months to December 2019, which is a 115% increase since 2009. Of these 32,669 assaults, 9,995 assaults were on staff, and 23,113 were prisoner-on-prisoner assaults.

The decline in safety in prisons has been attributed in part to high levels of drug use and associated debt and bullying, and regime restrictions undermining the delivery of rehabilitative services including education, mental health treatment, substance misuse treatment and offending behaviour programmes (Beard, 2019).

Drug Misuse and Mental Health

The quantity of drugs seized by prison staff has increased by 41% between March 2018 and March 2019 and 1 in 10 random mandatory drug tests (MDT) in prison in 2019 were positive—the second highest level on record (Prison Reform Trust, 2019).

People in prison are more likely to suffer from mental health problems than those in the community. Nearly half the prison population have depression or anxiety, 25% have both (Ministry of Justice, 2013), and suicide rates are considerably higher than in the general population (Department of Health, 2005). In the year after release from custody, prisoners who have anxiety and depression are more likely to be reconvicted than those who do not (Ministry of Justice, 2012). The Royal College of Psychiatrists (2017) noted that there are significantly higher rates of neurodevelopmental disorders such as ADHD, autistic spectrum disorder, learning disabilities, personality disorder and dependence on and harmful use of drugs and alcohol in prisons than in the rest of the population. Prisoners have often had

prior experiences of disadvantage, abuse and violence, including childhood and family backgrounds of emotional, physical or sexual abuse and domestic violence (Ministry of Justice, 2012). People in prison have typically experienced a higher frequency of bereavement and are more likely to have experienced bereavement from traumatic deaths, such as murder or suicide (De, 2018). Moreover, 46% of women and 27% of men have attempted suicide at some point in their lives before custody, compared with just 6% of the general population (Justice Committee, 2019). Untreated mental health conditions, especially schizophrenia and personality disorders, and substance misuse disorders, are associated with higher rates of suicide and self-harm (Committee of Public Accounts, 2017).

The World Health Organisation has stated that “prisons are bad for mental health” and had identified a number of factors that are likely to exert a negative effect on mental health for prisoners such as overcrowding, various forms of violence, enforced solitude or conversely, lack of privacy, lack of meaningful activity, isolation from social networks, insecurity about future prospects (e.g. work, relationships), and inadequate health services, especially mental health services (World Health Organisation, 2005).

The complex and challenging nature of the prison population and the stresses and restrictions inherent in being incarcerated means that many prisoners find it extremely challenging to navigate the criminal justice system, and such individuals can be extremely challenging to manage within correctional settings (Justice Committee, 2019).

Recidivism

Alongside increasing rates of imprisonment and complexity within the prison population, reoffending is an equally serious problem in the UK, with the cost of

imprisonment rising in recent years, averaging £35,601 per prison place, which is an increase of 8% in the last five years (Prison Reform Trust, 2019). The proven re-offending rate over the last 12 years in England and Wales for adult and juvenile offenders has fluctuated between 28.7% and 31.8 (Ministry of Justice, 2020b). During the period January to March 2018, adults released from custodial sentences of less than 12 months had a proven reoffending rate of 62.7% and the total estimated economic and social cost of reoffending is currently thought to be £18.1 billion (Newton, 2019). Excluded from this estimate are the non-quantifiable and long-term costs to victims, families (of both victims and offenders), and to society more generally (Shonin et al., 2013).

In view of the above, there is a clear need for effective, evidence-based interventions that target recidivism, mental health and substance misuse.

Offending Behaviour Programmes

In the UK there are a number of offender behaviour programmes (OBP) which aim to change the thinking, attitudes and behaviours which may lead people to reoffend. These programmes often use 'second wave' cognitive behavioural techniques and are designed to target dynamic risk factors or "criminogenic needs" such as deficits in impulsivity, anger, substance misuse, and self-regulation (Andrews & Bonta, 2014; Dafoe & Stermac, 2013; Gottfredson & Hirschi, 1990; Hanson, 2009). Andrews and Bonta (2010) suggest that the number of criminogenic needs targeted in therapy plays an important role in treatment success. This is often referred to as the multimodal principle. Adhering to the multimodal principle has been shown to not only reduce recidivism but also increase the treatment effect size (Andrews & Bonta, 2010).

Meditative Approaches Used in Prisons

Whilst 'third wave' cognitive behavioural approaches have a robust evidence base in non-clinical and clinical populations, these have been slow to arrive in the criminal justice system. Meditative approaches have however been adapted for offender populations to support their mental health and reduce their recidivism rates. Within prison populations, there has been research exploring the use of three different types of meditation within prison settings: transcendental meditation, vipassana meditation, and mindfulness-based interventions.

Transcendental Meditation (TM)

TM is defined as a technique in which one systematically develops a finer, more subtle experience of conscious attention (Ferguson & Gowan, 1976). The actual psychological technique of TM is to recite a given mantra and return to this mantra any time the mind wanders. Practice is encouraged for 15 to 20 minutes twice a day, with the goal of TM being to transcend duality and suffering (Goleman, 1988).

Vipassana Meditation (VM)

Vipassana, is a form of insight-based mindfulness meditation which is rooted in Buddhist practice and which means "to see clearly" (Goleman, 1988). Vipassana is traditionally taught as a 10-day, silent residential retreat in which participants meditate for upwards to 10 hours in total silence. The actual technique behind Vipassana is the observation of the physical sensations occurring across the whole body involving

mindfulness of the breath and becoming aware of the impermanent (i.e., transient) nature of thoughts and feelings (Perelman et al., 2012).

Mindfulness-Based Interventions (MBIs)

Mindfulness has been operationalised as deliberate, non-judgmental awareness of the present moment (Kabat-Zinn, 2003). Mindfulness can be described as a trait, state, and process, and has been successfully incorporated into a number of evidence-based standardised mindfulness based programmes in both clinical and non-clinical populations including Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1990), Mindfulness-Based Cognitive Therapy (MBCT; Teasdale et al., 2000), and Mindfulness-Based Relapse Prevention (MBRP; Bowen et al., 2014).

MBSR is a group-based intervention generally delivered during an 8 week period and comprises weekly sessions, typically 3 hours in duration; guided mindfulness exercises; yoga exercises; a recording of guided meditation to facilitate self-practice; and an 8 hour silent retreat component. While originally developed as a programme for chronic pain, MBSR has since been adapted to a wide range of populations including those residing in correctional facilities.

MBCT attempts to reduce incidences of ruminative depressive thinking patterns and to prevent relapses in major depressive episodes (Baer, 2003; Teasdale, Segal, & Williams, 1995). The major aim of this programme is to combine MBSR with cognitive therapy to facilitate a de-centring approach to viewing one's thoughts (e.g., "I am not my thoughts"), feelings, and sensations (Baer, 2003; Teasdale et al., 1995).

MBRP (Bowen et al., 2011; Witkiewitz et al., 2005) follows a similar structure to MBSR, but is specifically tailored for treating substance misuse and integrates various cognitive-behavioural techniques designed to modify drug-related beliefs (Lee et al., 2010). A mindfulness approach to substance misuse focuses on bodily awareness and acceptance of craving, rather than reappraisal (Witkiewitz et al., 2005). MBRP includes the body scan, sitting, and walking meditation, as well as compassion meditation, with additional discussion of applying mindfulness to prevent drug and alcohol relapse (Bowen et al., 2011).

Meditative Research in Prisons

A recent systematic review and meta-analysis was carried out to explore the outcomes of psychological therapies for prisoners with mental health problems, and found that CBT and mindfulness-based therapies were modestly effective in prisoners in treating depression and anxiety symptoms, and that additional psychological treatments such as Dialectical Behaviour Therapy and other group treatments such as Music Therapy and Art Therapy (including self-help treatments) needed stronger evidence before they could be considered in jails and prisons (Yoon, Slade & Fazel, 2017).

The Mindful Nation UK Report (MAPPG, 2015) reviewed some of the literature relating to mindfulness-based interventions within the criminal justice system and showed that research was emerging that indicated the potential for mindfulness-based interventions to reduce violence in prisons and re-offending rates by improving self-regulation, reducing negative affectivity, reducing drug use and associated attitudes and behaviours, and improving regulation of sexual arousal and control of aggression in offender populations (MAPPG, 2015).

Over the last decade a number of reviews have explored the above meditative approaches within correctional settings (Auty et al., 2017; Chiesa, 2010; Dafoe & Stermac, 2013; Himelstein, 2011; Lyons & Cantrell, 2016; Per et al. 2020; Shonin et al., 2013).

Three narrative reviews (Dafoe & Stermac, 2013; Himelstein, 2011; Lyons & Cantrell, 2016) have reviewed studies conducted in correctional settings using MBIs, VM and/or TM. Dafoe & Stermac (2013) reviewed research relating to MBIs, TM and VM in correctional settings and concluded that a number of different meditative approaches have been shown to be effective across a number of clinical populations found in correctional settings and that they are effective for working with difficulties identified as dynamic, criminogenic needs such as self-regulation, and therefore have utility as an adjunct approach to working with individuals residing within the correctional system. Himelstein (2011) reviewed studies exploring meditation-based programmes in correctional populations and highlighted that meditation—based programmes could provide sufficient treatment in this population through the enhancement of psychological wellbeing, a decrease in substance use, and a decrease in recidivism and could therefore support rehabilitation for correctional populations. Lyons & Cantrell (2016) briefly reviewed three studies that used either a MBI or VM and concluded that meditation programmes could be used as part of a social and political movement to address the issue of mass incarceration, but to do this these programmes would need to incorporate concepts such as interdependency and non-duality between the “helper” and the “helped” and the building of meditation communities both inside and outside of prison. None of these reviews however conducted a systematic review of the literature or provided a robust evaluation of the quality of the studies included in the reviews, leading to tentative conclusions being drawn from these reviews.

Two systematic reviews have been conducted that have examined meditative approaches in correctional settings (Shonin et al., 2013; Chiesa, 2010). Shonin et al. (2013) carried out a systematic review of the literature of mindfulness and other Buddhist-derived interventions in correctional settings and reviewed 8 studies and found significant improvements across five key criminogenic variables: negative affect, substance use (and related attitudes), anger and hostility, relaxation capacity, and self-esteem and optimism. Shonin et al. (2013) however noted that there were a number of major quality issues and that methodological rigour needed to be substantially improved to be able to evaluate the suitability and efficacy of Buddhist-derived interventions for prisoner populations. Chiesa (2010) conducted a systematic review of VM, which included studies carried out with non-incarcerated populations in addition to incarcerated populations, and concluded that VM could reduce alcohol and substance abuse but not post-traumatic stress disorder symptoms in prisoners. The studies included in this review however were considered to be low quality, with any conclusions drawn being considered with caution, and it was highlighted that further research was needed in this area. Whilst these reviews have been a helpful addition to the literature on meditative approaches in correctional settings, limitations to these reviews are that they either focused on MBIs and VM (Shonin et al., 2013) or VM only (Chiesa, 2010) and did not include other meditative approaches such as TM, and that additional research has been carried out since the publication of both of these reviews.

Two more recent systematic reviews/meta-analyses have been carried on MBIs and/or VM (Per et al. 2020; Auty et al., 2017). Per et al. (2020) conducted a meta-analysis to quantify the effectiveness of MBIs in incarcerated populations on key psychological outcomes and criminogenic needs, and concluded that although findings offered preliminary

support of the efficacy of MBIs in targeting psychological health in incarcerated populations, further controlled studies were required to examine criminogenic outcomes and recidivism rates after treatment. Auty et al. (2017) carried out a review and two meta-analyses that examined whether prison yoga and meditation programmes are significantly related to increased psychological wellbeing and improvements in the behavioural functioning of prisoners. This paper concluded that yoga and meditation have favourable effects on prisoners however called for future research with more robust designs, of different prison populations, with longer follow-up periods, and making use of standardised assessment tools. Both of these reviews however did not include TM, and Auty et al. (2017) conducted their systematic review and meta-analysis on both MBIs and yoga, and Per et al (2020) excluded studies where data were insufficient to compute effect sizes, thereby missing a number of studies that have been conducted in this area.

Aims of Current Review

This systematic review aims to build on the aforementioned previous reviews by pooling together all published research on meditative approaches in correctional settings to provide a comprehensive and up-to-date review of the literature. More specifically, this current review aims to do the following:

1. To assess the quality of research of studies examining different meditative approaches in correctional settings and to examine whether the quality of the research in this area has improved over time.

2. To outline the findings of research into meditative approaches in correctional settings in terms of psychological and physical wellbeing, criminogenic needs, and recidivism.
3. To make recommendations for future research to help develop the evidence base for meditative approaches in correctional settings.

Method

Inclusion and Exclusion Criteria

For the purposes of this literature review, the following inclusion/exclusion criteria were used (see Table 1)

Table 1 - Inclusion and exclusion criteria

	Inclusion Criteria	Exclusion Criteria	Rationale
Study Design	Experimental, Quantitative, Correlational	Qualitative	To increase homogeneity and interpretability of the studies
Sample	Adults	Children and/or adolescents	There are acknowledged to be important biological, psychological and social factors that make juvenile offenders different from adult offenders, necessitating taking different approaches to interventions (Richards, 2011)
	Prison setting	Community/probation or inpatient forensic mental health settings	To increase homogeneity and interpretability of the studies
Intervention	Meditation was the main intervention used in the study (e.g. mindfulness, transcendental, vipassana)	An intervention other than meditation was used as the primary intervention or in conjunction with a meditation intervention (e.g. yoga) The meditation intervention was delivered as part of an established third-wave therapy (e.g. DBT, ACT)	To limit the inclusion of other mechanisms of action that could be associated with adjunct approaches that could confound the results.

Outcome measures	Outcomes measured relate to distress, criminogenic needs and/or recidivism	Outcomes measured did not relate to distress, criminogenic needs and/or recidivism	To enable the review to focus on outcomes relating to forensic clinical psychology
Language	Published in English	Published in any other language	Spoken language of author
Publication	Published in a peer reviewed journal	Thesis research and unpublished research	To ensure that the research has already been quality reviewed by other experts in the field
Data	Reporting original data (not a review)	Did not include new data (e.g. a theoretical and/or descriptive review paper)	To avoid replication of data

Search Strategy

An electronic search was conducted on 14th February 2020 using PsychInfo, Embase, Medline, Pubmed, Web of Science and CINAHL databases. To identify all papers relevant to the review question, the following search terms and search strategy was used, which are summarised in Table 2.

Table 2 - Search terms and search strategy

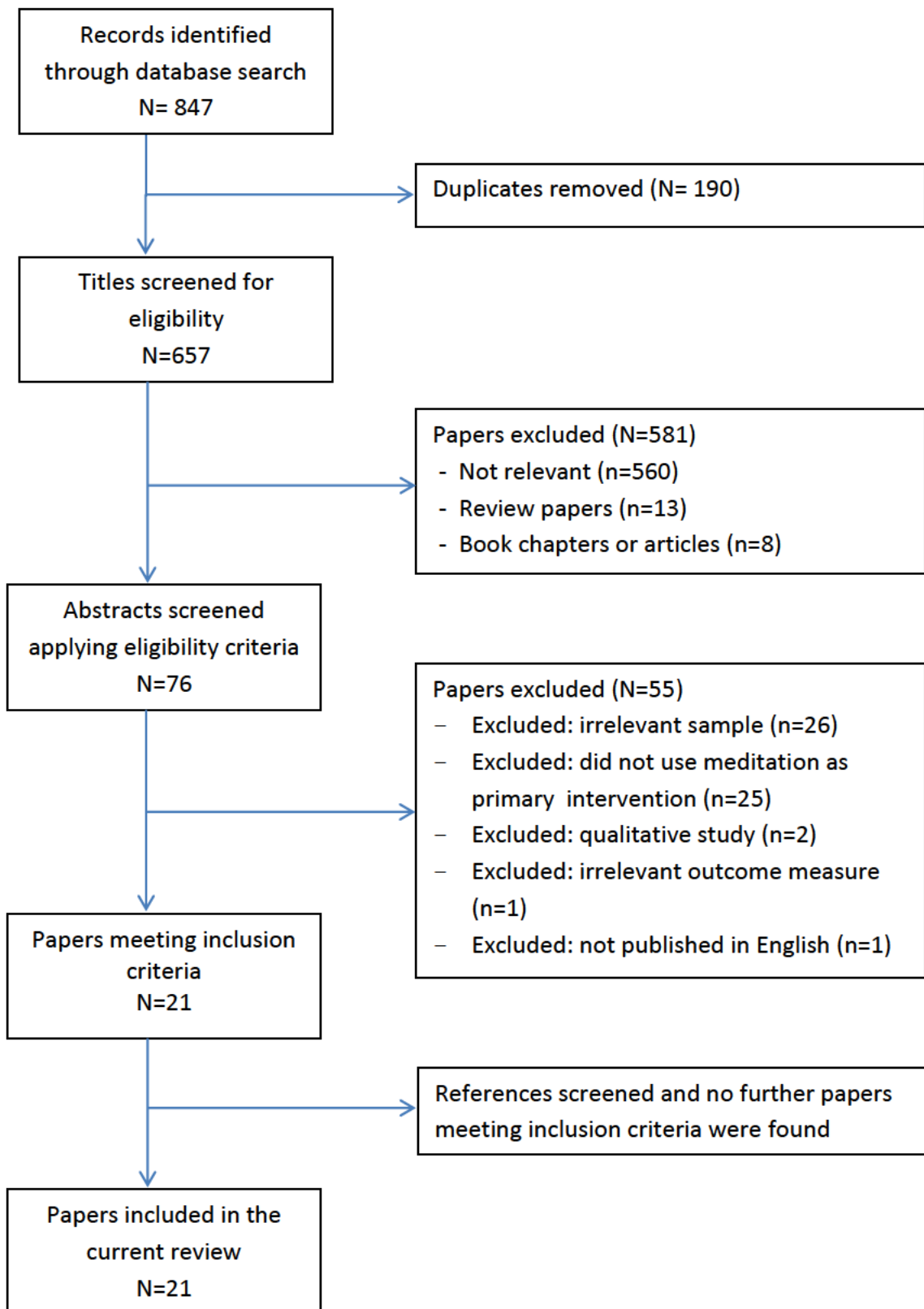
Search Terms	
1. Meditation 2. Mindful* 3. Transcendental 4. Vipassana	5. Forensic 6. Prison* 7. Correctional 8. Offend* 9. Incarcerat* 10. Crimin* 11. Justice 12. Jail 13. Inmate*
Search Strategy	
(1 or 2 or 3 or 4) AND (5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13) = 847	

Database Search Results (PRISMA)

As recommended by Moher et al.'s (2009) Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), in order to aid methodological clarity and transparency, Figure 1 shows the flow of information through the different phases of the current review.

A total of 21 papers were identified for inclusion. The search of PsychInfo, Embase, Medline, Pubmed, Web of Science and CINAHL databases provided a total of 847 citations published in English. After removal of duplicates, 657 papers were screened against the inclusion/exclusion criteria for eligibility. Of these, 560 papers were identified as irrelevant, 13 were identified as review papers, and 8 were identified as book chapters or articles. Abstracts of the remaining 76 papers were screened using the inclusion and exclusion criteria, and a further 55 papers were excluded. A total of 21 papers met the inclusion criteria and when the references of these papers were checked, no further papers meeting the inclusion criteria were found. A total 21 papers were therefore included in this current review.

Figure 1 – PRISMA flow diagram of review process with reasons for exclusion.



Results

Description of studies and quality review

Summary of Included Papers

Table 3 provides a summary of the 21 papers that were included in this current review.

Of the 21 papers reviewed, 19 incorporated a control group in the research design, 1 paper was a pre-post non-experimental design and 1 paper was a correlational study. Of the 19 studies that incorporated a control group, 6 used a wait-list control group, 6 used a treatment as usual control group, 3 used a matched control group, 2 used a comparison control group, 1 used a 'non-completers' control group, and 1 used a no-treatment control group.

The median sample size reported was 88, with 10 studies reporting fewer than 88 participants (total N range: 11 - 74 participants) and 10 studies reporting more than 88 participants (total N range: 89 - 1,350 participants). The majority of studies used male participants (n=14), however 4 studies used a mixture of male and female participants and 3 studies used all female participants. The majority of studies were conducted in the US (n=17), with 2 conducted in China, 1 conducted in Taiwan, and 1 conducted in the Netherlands Antilles. Studies were conducted using diverse offender populations from maximum security prisons (n=7), high-medium security prison (n=1), medium security prisons (n=6), minimum security jails (n=9), psychiatric prison (n=1), and women's prisons (n=4); with sentences ranging from 10 or more years for violent and/or repeat offences such as murder, robbery, kidnapping, corruption and drug trafficking, to 1 year sentences for

offences such as driving under the influence, theft, possession or sale of illicit drugs and prostitution.

A number of different forms of meditation were used for the experimental intervention in the studies, consisting of Transcendental Meditation (TM; n=6), Vipassana meditation (VM; n=4), MBSR (n=1), MBRP (n=2), Mindfulness-Based Emotional Intelligence (MBEI) training (n=1), MBCT (n=2), Re-Entry Values and Mindfulness Programme (REVAMP; n=1), mindfulness meditation: not-specified/generic (n=2), and eclectic mixes of meditation approaches (n=2).

The outcome measures in the studies included in this literature review fell under three broad categories: psychological and physical wellbeing, criminogenic needs, and recidivism. Out of the 21 studies included in this literature review, the majority of studies looked at both psychological and physical wellbeing alongside criminogenic needs (n=12), with 6 studies focusing solely on psychological and physical wellbeing, and 2 studies focusing solely on recidivism. One study (Malouf et al., 2017) looked at all 3 outcome categories. 3 studies used secondary data for their analysis (Rainforth et al., 2003; Simpson et al., 2007; Bowen et al., 2007).

Due to the broad inclusion criteria used in this review there was a large amount of heterogeneity in the 21 papers, particularly in terms of study design, intervention and outcomes measures, and a meta-analysis was therefore not feasible. The findings were however organised in terms of meditation approach and category of outcome measure as mentioned above, and were analysed in a systematic manner through the aid of a quality review tool which is described in the following section of this review.

Table 3 - Summary table of included papers

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
1	The impact of mindfulness meditation on self-esteem and self-compassion among prisoners (Morley & Fulton, 2020)	Mindfulness meditation treatment group vs wait list control group.	N= 56 (n=24 mindfulness meditation group; n=32 wait list control group) male inmates in a local US jail	Self-compassion (Self-compassion scale; Neff, 2003) Self-esteem (Rosenberg Self-Esteem Scale; Rosenberg, 1965; Robins et al., 2001)	Mindfulness meditation classes conducted once a week for an hour, consisting of guided meditation, walking, and silent meditation as well as a group discussion. The meditation classes varied in size and further meditation outside the class time was optional.	More experienced meditators (greater than 4 weeks) had higher self-esteem, self-compassion and felt less isolation than the less experienced meditation group (fewer than 4 weeks) and the control group. The less experienced meditation group (less than 4 weeks) experienced lower self-esteem and self-compassion compared to the control group. Self-kindness was higher among the more experienced meditators compared to the less experienced meditators, however this finding was not significant.	Self-report measures used – potential for fabrication and bias Not possible to determine whether the improved self-esteem and self-compassion were, in turn, associated with reduced criminality in the future. Duration and frequency of meditation Unable to obtain participants criminal history. Relatively small sample Sample from a single institution in one geographic area -

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
							<p>results may not generalisable</p> <p>Did not control for mental health, which is prevalent among incarcerated persons.</p> <p>Rosenberg's self-esteem scale does not account for the impact prison culture has on self-evaluation – alternative measures that are context and culture specific may extend results of the current study.</p>
2	Mindfulness-Based Relapse Prevention in a Jail Drug Treatment Program (Lyons, Womack,	MBRP treatment group vs attention control comparison group (receiving	N=125 (n=54 MBRP group; n=71 communication skills comparison control group) male inmates	Mindfulness - Five Facets Mindfulness Questionnaire (short form), Bohlmeijer et al., 2011; Freiburg	Mindfulness-Based Relapse Prevention (MBRP) – manualised 6 week programme.	In both the treatment and control groups, PTSD and craving scores declined while mindfulness scores on the Freiburg scale, though not the FFMQ, increased.	<p>Unable to follow participants in the community to assess substance use post release</p> <p>Since both the treatment and</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
	Cantrell & Kenemore, 2019)	communication skills curriculum - manualised 6 week programme) Participants enrolled into experimental and comparisons groups as randomised cohorts over time.	in cohorts of 25 participants US large urban jail All participants were residents on a therapeutic community in a separate wing of the jail.	Mindfulness Inventory, Walach et al., 2006. Anxiety - Beck Anxiety Inventory (BAI; Beck et al., 1988) Alcohol/Drug Craving - Penn Alcohol/Drug Craving Scale (Flannery et al., 1999) PTSD - PTSD Symptom Checklist (Blanchard et al., 1996)		The decline in anxiety and PTSD was greater in the experimental condition than the control condition, however this was not significant.	comparison interventions took place in a therapeutic jail community, are unable to distinguish the effects of MBRP from the beneficial effects of other treatment received by participants.
3	The effect of mindfulness training on mental health in long-term	Mindfulness training group vs wait list control group	N=40 (n=19 mindfulness training group; n=21 wait list control group)	Mindfulness - Five-Facet Mindfulness Questionnaire – Chinese	6-week mindfulness training programme based on the	The mindfulness training group achieved a significant enhancement in FFMQ scores and a significant	Research design was not actually entirely randomised due to scheduling issues related to the

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
	Chinese male prisoners (An et al., 2019)		Long-term male prisoners with remaining sentences of at least 10 years for serious criminal behaviours such as corruption, murder, drug trafficking and robbery. China	version (FFMQ; Deng et al., 2011) Mental Health - Symptom Checklist-90 (Xin et al., 2012) Stress - Chinese Perceived Stress Scale (CPSS; Yang & Huang, 2003)	MBCT protocol. Some contents designed for coping with depression were determined to not be suitable for the sample of this study. These sections were replaced with other meditation practices from MBSR, such as mindfulness yoga.	reduction in mental health symptoms (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism and additional items) and perceived stress compared to the wait list control group.	Chinese prison Measurements were solely collected via self-report questionnaires. There were no follow-up assessments in the current study to assess maintenance of the effects of mindfulness training.
4	The impact of mindfulness meditation and self-compassion on criminal impulsivity in a prisoner sample (Morley, 2017)	Correlational study	N=74 male inmates US county jail	Self-Compassion - Self-Compassion Scale (Neff, 2003a) Impulse Control - Self-Control Scale	Weekly mindfulness meditation program	Number of weeks of mediation and self-compassion were both negative predictors of criminal impulsivity. Self-compassion partially mediated the relationship between the practice of	All of the variables in this study were measures by self-report, which is often susceptible to fabrication and bias. Relies on correlation information -does not determine if

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				(Grasmick et al., 1993)		meditation and criminal impulsivity	variables display any causal influence on each other. Relatively small sample size - findings should be interpreted with caution
5	A pilot RCT of a values-based mindfulness group intervention with jail inmates(Malouf et al., 2017)	Treatment group (REVAMP+TAU) vs control group (TAU).	N=40 (n=21 REVAMP+TAU group; n=19 control group), male inmates in a US jail	Mindfulness - Mindfulness Inventory: Nine Dimensions (MIND; Harty et al., 2009 Emotion Regulation - Mindfulness Inventory: Nine Dimensions (MIND; Harty et al., 2009 Self-Control and Impulsivity - Brief Self-Control Scale	Values and mindfulness-based intervention (Re-entry and Values Mindfulness Program; REVAMP) incorporates and adapts elements from several MBIs, including ACT, Mindfulness-Based Relapse Prevention (MBRP), and DBT.	REVAMP group increased more on willingness/ acceptance, self-judgement, and shame relative to TAU. Increases in willingness/acceptance persisted at 3-month post-release. Marginally statistically significant trend of medium effect size for lower criminal recidivism in the REVAMP group compared to TAU.	Small sample size Although participants in both conditions had access to a broad range of programmes and services, it is possible that the REVAMP+TAU group received more treatment hours than TAU only. Generalisability to other populations, e.g. females or adolescent

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				<p>(BSCS; Tangney et al., 2004), UPPS Impulsive Behaviour Scale (Whiteside & Lynam, 2001)</p> <p>Shame- and Guilt-Proneness - Test of Self-Conscious Affect-4 (TOSCA-4; Tangney et al., 2008)</p> <p>BPD Features - Personality Assessment Inventory (PAI; Morey, 1991)</p> <p>Substance Use - Texas Christian University:</p>	<p>Throughout REVAMP, mindfulness meditation practice is encouraged through centring exercises at the beginning and end of sessions in addition to mindfulness meditation homework assignments.</p> <p>Delivered twice a week for 90 minutes over the course of 4 weeks.</p>		<p>offenders, or those not involved in the criminal justice system.</p> <p>Significant targets of the REVAMP intervention (e.g., values-based living) and aspects of the intervention (e.g. homework completion) were not formally assessed.</p> <p>Use of self-report measure of the majority of outcomes, which can be contaminated by social desirability bias and lack of insight</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				<p>Correctional Residential Treatment Form, Initial Substance Use Assessment (TCU-CRTF; Simpson and Knight, 1998).</p> <p>Recidivism – Frequency of criminal behaviour (arrests or undetected); Arrest frequency; Arrest latency</p>			
6	Transcendental meditation and reduced trauma symptoms in female inmates: a randomised controlled	TM group vs wait list control group	<p>N=22 (n=11 TM experimental group; n=11 wait list control group) female inmates</p> <p>US medium-security prison</p>	<p>PTSD - Post-traumatic Stress Disorder Checklist-Civilian version (PCL-C)</p>	<p>TM - Subjects participated in an individual personal instruction session and follow-up group meetings were held over 4</p>	<p>Significant reductions were found on total trauma scores, and on the intrusive thoughts and hyperarousal subscales.</p> <p>81% were compliant with their programme.</p>	<p>Use of self-report outcome measures may have introduced some possibility of bias.</p> <p>Pilot study with fairly small numbers and conducted during a</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
	study (Nidich et al., 2017)				consecutive days (about an hour each day). Participants were encouraged to practice individually in their prison cells twice a day for 20 minutes each session. They also were encouraged to attend 30- to 40-minute group meditation sessions, supervised by a TM teacher, twice a week during the 4-month intervention period.		relatively short time.
7	Reduced trauma symptoms and	TM group vs no-treatment control group	N=181 (n= 90 TM experimental	Trauma-related problems –	TM - Participants were taught the	Significant reductions in total trauma symptoms, anxiety,	Use of a no-treatment control condition in the

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
	perceived stress in male prison inmates through the transcendental meditation program: A RCT (Nidich et al., 2016)		group; n=91 no-treatment control group) male inmates with moderate- to high-risk criminal profile US – 1 medium-security and 1 maximum-security prison	Trauma Symptom Checklist-modified version (TSC-modified version; Briere, 1996) Stress - Perceived Stress Scale (PSS; Cohen et al., 1983)	technique during 5 sessions lasting approximately 1 hour per session. Participants were encouraged to practice individually in their prison cells twice a day for 20 minutes each session. They also were encouraged to attend 30- to 40-minute group meditation sessions, supervised by a TM teacher, several times a week during the 4-month intervention period.	depression, dissociation, and sleep disturbance subscales, and perceived stress in the TM group compared with controls. The high-trauma subgroup analysis showed higher magnitude of effects in the TM group compared with controls on all outcomes.	study rather than a more active control condition - the possibility that at least some of the benefits associated with the TM intervention are not specific to TM. Long-term stability and further improvement in trauma symptoms cannot be determined because of the absence of a follow-up measurement beyond the 4-month post-test assessment date.

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
8	The effects of mindfulness training on emotional health in Chinese long-term male prison inmates (Xu et al., 2016)	Mindfulness training group vs wait list control group	N=40 (n=19 mindfulness training; n=21 wait-list control) long-term male prisoners with at least 10 years remaining on sentence. Imprisoned for serious criminal behaviours, such as murder, robbery, kidnapping, or drug trafficking China	Mindfulness - Five-Facet Mindfulness Questionnaire – Chinese version (FFMQ; Deng et al., 2011) Anxiety - Zung Self-Rating Anxiety Scale – Chinese version (SAS; Tao and Gao, 1994) Depression - Zung Self-Rating Depression Scale – Chinese version (SDS; Liu et al., 1994) Mood State - Profile of Mood States – Chinese version (POMS; Wang et al., 2000)	6-week mindfulness training - 2.5 to 3 hours of group sessions once a week. Based on the MBCT protocol. Some of the contents designed for coping with depression were not suitable for the sample, and these sections were replaced with other meditation practices from MBSR, such as mindfulness yoga.. After each group session, participants were assigned 30 to 45 minutes of daily homework exercises. Due to limitations of privacy and personal space to	Mindfulness training group showed significant improvement in mindfulness level, anxiety, depression, tension-anxiety, depression-dejection, anger-hostility, confusion-bewilderment, and total mood disturbance.	Although we approximated randomization, it was not entirely randomised due to scheduling issues related to the Chinese prison system. All results were based on self-report measures Unable to collect long-term follow-up data Intervention was a 6-week mindfulness training without a full-day retreat. No qualitative data and behavioural data in this research Relatively small sample of long-term male prisoners - results cannot be generalised to other prison populations.

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
					meditate, the homework exercises were replaced by a short group mindfulness practice guided by a psychological counsellor of the prison.		
9	The impact on a mindfulness based program on perceived stress, anxiety, depression and sleep of incarcerated women (Ferszt et al., 2015)	Pre-post non-experimental design	N=33 (n = 18, Group 1 - Autumn 2012; n = 15, Group 2 – Autumn 2013) female inmates US	Stress - Perceived Stress Scale (PSS; Cohen et al., 1983) Anxiety - State Trait Anxiety Scale (STAI) Sleep - Pittsburgh Sleep Quality Index (PSQI) Depression - Center for Epidemiological Study D 10	Mindfulness-based emotional intelligence (MBEI) 12-week training programme (Path to Freedom), which also employs keys elements of social emotional learning and mindfulness-based cognitive behavioural training. 1 ½ hours per	Participants had significantly less perceived stress, anxiety, and depression following the intervention as compared to before the intervention.	Convenient small sample size Lack of control group Problems with the delivery of the intervention in the second group

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
					<p>week. Each session included a basic mindfulness meditation for 10 minutes and a mindfulness movement exercise for 10 minutes. A new meditation was delivered and practiced for 20 minutes.</p> <p>In between the group sessions, they had written homework assignments to complete and each participant was given a CD to practice relaxation and concentration meditations.</p>		
10	Meditation in a deep South	VM group vs comparison	N=127 (n=60 VM; n=69)	Mindfulness - Cognitive and	Intensive 10-day Vipassana	VM participants achieved enhanced	The motivations to participate or change

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
	<p>prison: A longitudinal study of the effects of Vipassana (Perelman et al., 2012)</p>	<p>group (Houses of Healing intervention)</p> <p>Longitudinal study (Pre, Post, and 1-year follow-up)</p>	<p>comparison group), male long-term inmates in a US maximum security prison, which specialises in managing repeat and violent offenders with lengthy sentences and inmates with repeated behavioural difficulties</p> <p>US</p>	<p>Affective Mindfulness Scale-Revised (CAMS-R; Feldman et al., 2007)</p> <p>Anger - Novaco Anger Inventory-Short Form (NAI-25; Mills et al., 1998)</p> <p>Mood State - Profile for Mood States-Short Form (POMS-SF; Shacham, 1983)</p> <p>Emotional Intelligence - Trait Meta-Mood Scale (TMMS; Salovey et al.,</p>	<p>Meditation retreat - students follow a strict schedule that includes approximately 11 hours of meditation each day. No oral, written, or nonverbal communication among students for the first 9 days is permitted, although they can however, communicate privately with the teacher during designated times. The retreats took place in one of the prison gyms adapted to</p>	<p>levels of mindfulness and emotional intelligence and had decreased mood disturbance relative to a comparison group.</p> <p>Both groups' rates of behavioural infractions were reduced at one-year follow-up.</p>	<p>in the treatment and comparison group can be assumed to have been comparable, especially given the similarity in the mindfulness approach of both programmes. Due to the lack of randomisation in the sample, the ability to distinguish between direct influences of the mediation retreat and factors related to volunteerism is diminished.</p> <p>Attrition across measurement time periods</p> <p>Relatively low levels of baseline infractions reflected</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				1995) Institutional Adjustment - Infractions, Segregation, and Infirmary visits.	create a mediation hall and areas for sleeping and eating.		in a sizable number of the participants' records - both groups had to meet certain eligibility criteria such that inmates who had several recent or consistently high levels of institutional infractions were generally screened out.
11	Psychosocial outcomes of mindfulness-based relapse prevention in incarcerated substance abusers in Taiwan: A preliminary study (Lee et al., 2011)	MBRP group vs TAU group (substance use education)	N=24 (n=10 MBRP group; n=14 TAU group) male inmates with substance use disorders (1-year sentences due to possession or sale of illicit drugs) Taiwan	Positive and negative aspects of drug use and frequency of drug use - Drug Use Identification Disorders Test: Extended (DUDIT-E; Berman et al., 2007) Self-Efficacy -	Mindfulness-Based Relapse Prevention (MBRP) – 10 week 1.5 hour sessions (weeks 1-4 focused on relapse prevention and weeks 5-10 focused on mindfulness)	MBRP participants had significantly higher negative expectancies of substance use compared to TAU group. Significant decreased depressive mood in MBRP group. Neither changes in positive expectancies nor self-efficacy differed significantly	Small RCT - may not have provided ample power to detect all effects. Lacked a longer-term follow-up assessment. Only male participants - cannot be generalised to female inmates. Depression was

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				<p>Drugs Avoidance Self-Efficacy Scale (DASE; Martin et al., 1995)</p> <p>Depression - Beck Depression Inventory-II (BDI-II)</p>		between groups from pre- to post-intervention.	measured weekly in the MBRP group only, disallowing the possibility of a between-group comparison of changes in BDI-II scores.
12	The benefits of meditation practice in the correctional setting (Sumpter et al., 2009)	Meditation group vs TAU control group	<p>N=33 (n=17 meditation group; n=16 control group) female inmates</p> <p>US residential detention facility for non-violent offenders. The programme was offered to female offenders in lieu of serving time, which</p>	<p>Physical symptoms (visual symptoms, aches, numbness and chest pain),</p> <p>Emotions (wanting to throw things or hit people, feeling guilty, feeling hopeless about the future)</p>	7-week meditation programme for 2 ½ hours per week. The following meditative practices were offered: counting in breaths and out breaths, repeating a phrase or mantra (which was self-selected),	Experimental group experienced fewer sleeping difficulties, less desire to throw things or hit people, and less nail or cuticle biting; were more hopeful about their future; and felt less guilt.	This meditation programme complemented the silence requirement of the facility - where detainees were not allowed to talk unless permission was granted. To qualify for participation, detainees had to complete part I of phase I of the programme (at the DOC) and have a minimum of 10

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
			could range from 5 to 15 years, in a state prison.	<p>Behaviours (nail biting, sleeping difficulties)</p> <p>All were measured using a modified version of the Medical and Psychological Symptoms Checklist, Borysenko, 1987)</p>	walking meditation, and moving meditation (simple yoga postures). This was termed a structured meditation programme because the facilitators took an active role in introducing and talking about meditation practices rather than just sitting together in quiet without instruction or discussion.		<p>weeks left in the programme. This process guaranteed that programme participants already experienced a period of quiet time and had the opportunity to begin the introspection process before the beginning of the workshop. It is arguable that ours is a conservative test of the effectiveness of meditation programme because our control group may have benefited from the silence of the facility.</p> <p>The measures collected for the medical symptoms, emotions, and behaviours were</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
							<p>self-reported, which may be prone to some inaccuracy as a result of less than accurate memory recall</p> <p>This study did not use a random sample of the female inmate population but was limited to female detainees under a probation sentence to serve approximately 20 weeks in a secure community correctional setting. This means that we cannot generalise our results to the broader population. Therefore, our findings may not be relevant to violent female offenders sentenced to an</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
							institutional setting or to male offenders Sample size is small
13	The role of thought suppression in the relation between mindfulness meditation and alcohol use (Bowen et al., 2007)	VM group vs TAU group	Uses secondary data (Bowen et al. 2006); N= 173 (n=57 VM group; n=116 TAU group) male and females inmates US minimum security jail for offenses such as driving under the influence, theft, drug possession, and prostitution. Inmates with violent felony charges or sex offences were	Thought suppression - White Bear Suppression Inventory (WBSI, Wegner & Zanakos, 1994) Quantity and frequency of peak weeks of alcohol use - Daily Drinking Questionnaire (DDQ; Collins et al., 1985). Alcohol-related negative consequences - Short Inventory of Problems	10-day Vipassana meditation program - participants practice sitting meditation for approximately 8-10 hours daily. Meditation instructions focused on observation of breath and body sensations, and acceptance, rather than reaction or avoidance, of internal experiences. Throughout the course, participants	Significant decreases in thought suppression for VM participants that partially mediated the effects of VM on post-release alcohol use and consequences 3 months following release from jail.	Absence of random assignment to condition Sample represents a unique and specific population of incarcerated adults who were not necessarily seeking treatment High attrition rate (approximately 47% at 3 months)

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
			not accepted by the facility.	(SIP; Miller et al., 1995).	refrained from reading, writing or speaking, aside from asking questions to the instructor.		
14	PTSD symptoms, substance use, and Vipassana meditation among incarcerated individuals (Simpson et al., 2007)	VM group vs TAU group	<p>Uses secondary data (Bowen et al. 2006); N=88 (n=29 VM group; n=59 TAU group) male and females inmates</p> <p>US minimum security jail for offenses such as driving under the influence, theft, drug possession, and prostitution. Inmates with</p>	<p>Alcohol use quantity and frequency - Daily Drinking Questionnaire (DDQ; Collins et al., 1985)</p> <p>Drug use quantity and frequency - Daily Drug-Taking Questionnaire (unpublished measure; Parks, 2001</p> <p>Impulse control, social responsibility,</p>	10-day Vipassana meditation program - participants practice sitting meditation for approximately 8-10 hours daily. Meditation instructions focused on observation of breath and body sensations, and acceptance, rather than reaction or avoidance, of internal experiences.	<p>PTSD symptom severity did not differ significantly between those who did and did not complete the course.</p> <p>Participation in the course was associated with significantly greater reductions in alcohol and drug use than TAU, regardless of PTSD symptom severity level.</p>	<p>Self-selection into the Vipassana course may have introduced bias and did yield unequal cell sizes</p> <p>Small final sample size</p> <p>Use of self-report measures - particularly the validity of self-reported alcohol and drug use.</p> <p>High attrition rate – although attrition analyses indicated that there were not significant</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
			<p>violent felony charges or sex offences were not accepted by the facility.</p>	<p>and physical, interpersonal, and intrapersonal consequences of alcohol use - Short Inventory of Problems (SIP-2R) adapted from the Drinker Inventory of Consequences (DrInC; Miller et al., 1995)</p> <p>Psychological distress - Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982)</p> <p>PTSD - PTSD Checklist-Civilian version (PCL-C; Blake et al., 1995)</p>	<p>Throughout the course, participants refrained from reading, writing or speaking, aside from asking questions to the instructor.</p>		<p>differences on key indices between those we were able to follow and those who were lost to follow-up, which suggests results are representative of the entire sample.</p> <p>May also not be generalizable to a non-incarcerated population.</p> <p>A measure of mindfulness and a diagnostic measure of PTSD was not included in study.</p> <p>PCL-C was not re-administered at the follow-up assessments; thus, we do not know whether the intervention had any</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
							specific beneficial, or detrimental, effect on the participants' PTSD severity.
15	Mindfulness-based stress reduction in Massachusetts correctional facilities (Samuelson et al., 2007)	MBSR group vs quasi-waitlist controls/quasi-follow-up group	N=1,350 male and female inmates with substance use disorder US institutions – 1 women's prison and 5 correctional institutions for men (4 medium-security facilities and 1 minimum-security, pre-release facility)	Hostility - Cook and Medley Hostility Scale (Barefoot et al., 1989) Self-Esteem - Rosenberg Self-Esteem Scale – (Rosenberg, 1979) Mood State - Profile for Mood States (POMS; McNair et al., 1992)	6-8 week MBSR programmes.12 – 20 participants. Class sessions varied from 1-1.5 hours. In some cases, where individual classes were shorter, two sessions were held per week.	Highly significant pre-to post-course improvements were found on measures of hostility, self-esteem, and mood disturbance. Improvements for women were greater than those for men. Improvements were also greater for men in a minimum-security, pre-release facility than for those in 4 medium-security facilities.	All measures were self-report No records of inmates' compliance with the out-of-class programme demands Did not include any examination of inmates' behaviour before, during, and after their participation in the MBSR programme or of the effects of the programme on their substance abuse attitudes, such as cravings. Did not have access to inmate

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
							demographics (other than their being incarcerated in drug units) and were not able to follow the participating inmates during a longer period. Unable to measure impacts on recidivism rates.
16	Mindfulness meditation and substance use in an incarcerated population (Bowen et al., 2006)	VM group vs TAU group	N=173 (n=57 VM group; n=116 TAU group) male and female inmates with substance use disorder. US minimum security jail for offenses such as driving under the influence, theft, drug	Alcohol use quantity and frequency - Daily Drinking Questionnaire (DDQ; Collins et al., 1985) Drug use quantity and frequency - Daily Drug-Taking Questionnaire (unpublished measure;	10-day Vipassana meditation program - participants practice sitting meditation for approximately 8-10 hours daily. Meditation instructions focused on observation of breath and body sensations, and acceptance,	Significant reductions for VM participants in alcohol, crack cocaine and marijuana use plus less psychological distress, greater alcohol-related internal locus of control, and greater optimism	Lack of a randomised controlled design - jail staff and VM teachers were already conducting course with inmates prior to the start of the current research. Number of days between course completion and post-release follow-up varied across individuals.

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
			possession, and prostitution. Inmates with violent felony charges or sex offences were not accepted by the facility.	Parks, 2001 Impulse control, social responsibility, and physical, interpersonal, and intrapersonal consequences of alcohol use - Short Inventory of Problems (SIP-2R) adapted from the Drinker Inventory of Consequences (DrInC; Miller et al., 1995) Perceptions of control over alcohol - Drinking-Related Locus of Control scale (Donovan &	rather than reaction or avoidance, of internal experiences. Throughout the course, participants refrained from reading, writing or speaking, aside from asking questions to the instructor.		3-month follow-up period may have been too short to examine relationships between course participation and long-term health and legal outcome All measures were self-report No adherence or mindfulness measures were given during or following the course to assess whether participants understood and correctly practiced the techniques The course setting (i.e., in a separate, silent, smoke-free environment with vegetarian meals)

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				<p>O'Leary, 1978)</p> <p>Thought suppression - White Bear Suppression Inventory (WBSI, Wegner & Zanakos, 1994)</p> <p>Psychological distress - Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982)</p> <p>Optimism - The Life Orientation Test (Scheier & Carver, 1985)</p>			may have played a role in the improvement of the participants. It is therefore not clear whether effects of course participation were due to mindfulness training or other course characteristics.
17	Effects of the Transcendental Meditation Program on Recidivism	Retrospective study - TM group vs matched control group	Uses secondary data (Bleick & Abrams, 1987); N=248 (n=120 TM	Recidivism – Salient factor score (the 1981 revised version; Hoffman,	Transcendental Meditation	TM group had a 46.7% recidivism rate during the follow-up period compared to 66.7% for the controls which was	Only a small fraction of actual crimes lead to arrest and reconviction, and so it is likely the

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
	Among former inmates of Folsom Prison: Survival analysis of 15 year follow-up data (Rainforth et al., 2003)		experimental group; n= 128 matched control group) male inmates US maximum security prison	1983); California Justice Department's Bureau of Identification rap sheets from post-release criminal records.		statistically significant. Survival analysis indicated the risk of recidivism was reduced by 43.5%, and that 58.1% of the TM group versus 73.7% of the control group would eventually re-offend.	released offenders in this study committed a greater number of new offenses than were recorded. Lack of random assignment - due to retrospective case-control design, alternative explanations for the results cannot be ruled out. Participants self-selected to learn the TM technique.
18	Consciousness-Based rehabilitation of inmates in the Netherlands Antilles: Psychosocial and cognitive changes	TM group (completers) vs control group (non-completers)	N=300 (n=149 TM group; n=151 control group) male inmates predominantly medium security inmates	Expectancy of benefits from the practice of TM - Expectancy Question (EXPECT; Alexander et al., 1996)	Transcendental Meditation	Significant positive changes in the experimental group on cognitive distortion and intelligence-related measures factors (specifically increases in field independence).	Low compliance with TM treatment High attrition rate Differential sensitivity of the measures to treatment effects, and possible

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
	(Hawkins et al., 2003)		Netherlands Antilles	<p>Socially desirable responding - Socially Desirable Response Set (SDRS; Hays et al., 1989); How I Think Questionnaire Anomalous Responding (HITAR) Subscale (Barriga & Gibbs, 1996; Gibbs et al., 1996)</p> <p>Mental health - Mental Health Inventory (MHI; Veit & Ware, 1983)</p> <p>Hostility - Buss-Durkee</p>		A trend towards significance on the psychological wellbeing factor (increase in the emotional ties the inmates felt to family and friends, increased general positive affect, increased self-esteem, and increased prosocial behaviour)	<p>differences in the susceptibility of the tests to socially-desirable responding</p> <p>Because the changes in cognitive distortion and field independence were seen only in a subgroup of the population sample, generalisability of these results remains questionable, although there is inconclusive evidence that the subgroup came from a different population than the larger group of subjects.</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				<p>Hostility Inventory (BDHI; Buss & Durkee, 1957)</p> <p>Impulsiveness - Barratt Impulsiveness Scale (BIS; Barratt, 1959, 1965; Patton et al., 1995)</p> <p>Cognitive distortions - How I Think Questionnaire (HIT; Barriga & Gibbs, 1996; Gibbs et al., 1996; Gibbs et al., 1995)</p> <p>Self-Esteem - Self-Esteem Scale (SE; Alexander et al. 1996)</p>			

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				<p>Behaviour during the past month - Behavioural Inventory (BI; Childs, 1977)</p> <p>Field dependence-independence (psychological autonomy) - Group Embedded Figures Test (GEFT; Witkin et al., 1971)</p> <p>Speed of information processing - Zhang's Inspection Time Test (ITT; Zhang, 1991)</p>			
19	The Transcendental	Retrospective study -	N=518 (n=259 TM)	Recidivism – California	Transcendental Meditation	TM inmates had more favourable parole	Impossible to construct a control

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
	Meditation program and criminal recidivism in California (Bleick & Abrams, 1987)	TM group vs matched control group	<p>experimental group; n= 259 matched control group) male inmates</p> <p>US prisons – 2 maximum security and 1 high-medium security prison</p>	<p>Department of Corrections (CDC) parole outcomes while the parolee remains on parole up to two years; California Justice Department’s Bureau of Identification rap sheets for long-term follow-up data after discharge from parole.</p>		<p>outcomes than state-wide parolees. By comparison to matched controls, the TM group also had more favourable outcomes as determined from rap sheets 1-5 years after parole. TM significantly reduced recidivism at 1 year and at 6 months to 6 years after parole, whereas prison education, vocational training, and psychotherapy did not consistently reduce recidivism.</p>	<p>group demonstrably equal in risk of recidivism to the experimental group.</p> <p>Matching was restricted to a few social and criminal history variables available on CDC computer printouts - psychological test scores were not used and detailed personal history variables were not available. Cannot rule out the absence of unknown variables for which the TM group could be preselected and which could reduce or even eliminate the observed TM effect.</p> <p>With respect to the</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
							<p>regressions in which prison-sponsored programme participation was correlated with reduced recidivism, it is difficult to distinguish between the effect of motivation and the effect of actual practice of the various programmes.</p> <p>Non-recidivists could not be surveyed regarding regularity of TM practice.</p>
20	Meditation in a specialised correctional setting: A controlled study (Rhead & May, 1983)	Meditation group vs matched control group	<p>N=11 (n=6 experimental group; n=5 matched control group) male inmates.</p> <p>US psychiatric prison</p>	<p>Mental health (self-report) - Symptom Checklist-90 (SCL-90; Derogatis et al., 1973); Clinical Analysis Questionnaire (CAQ; Delhees</p>	2 month program with weekly group meetings. The types of meditation practiced covered a variety of traditional	Experimental group showed a significant reduction in symptomatology on 4 of the 10 factors of the SCL-90 (Obsessive-Compulsive, Anxiety, Psychoticism, and Global Severity Index) and on 6 of the 7 CAQ	<p>Small sample size</p> <p>All significant differences were found on self-report measures</p> <p>No precise data was gathered on the duration or</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				<p>& Cattell, 1971)</p> <p>Mental health (therapist rated) - Brief Psychiatric Rating Scale (BPRS; Overall and Gorham, 1962)</p> <p>Impulsivity - Monroe Dyscontrol Scale (Plutchik et al. 1974)</p> <p>Progression within the prison – Institutional records (tier level system)</p> <p>Behaviour - Institutional records: Medical</p>	<p>approaches. This variety was presented in the hope that each individual would select one or two techniques best suited to his own taste and personality. Participants were encouraged to practice regularly with the approach(s) they had selected. The forms of meditation covered Yogic disciplines of open concentration, attentiveness and imagery; Christian and Islamic prayer;</p>	<p>factors (more forthright, more relaxed, less anxious depression, high energy euphoria, low schizophrenia, low psychasthenia).</p> <p>Changes noted on 5 out of the 6 variables derived from therapists' reports (the single score of the PCS and 4 out of the 5 scales on the BPRS) showed changes that favoured the experimental group in terms of reduction of psychopathology and more adequate functioning in therapy, but these did not reach statistical significance.</p>	<p>frequency of these individual practices.</p> <p>Appeared that the measures used may have lacked sensitivity for the kinds of measurement required in the present study.</p> <p>Motivation of participants – concern over potential negative evaluation as a result of participation and a general impression that certain “far-out” experiences might be induced through meditation as a way to “get high”.</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				<p>incident reports (a resident is referred to the institutional infirmary for any kind of medical treatment) and Non-medical incident reports (occasions when the resident is reprimanded by one of the staff for a rule violation).</p> <p>Engagement in psychotherapy (therapist rated) - Personal Constructs Scale (Tomlinson,</p>	and Tibetan, Zen and other Buddhist approaches		

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				1967)			
21	The Transcendental Meditation program and rehabilitation at Folsom State Prison: A cross-validation study (Abrams & Siegel, 1978)	<p>TM experimental group vs wait-list control group</p> <p>Cross-validation study (2 separate TM experimental groups and 2 separate wait-list control groups at two different time points) resulting in a 'standardisation sample' (TM group 1 and control group 1) and a 'validation sample' (TM group 2 and control group 2)</p>	<p>N=89 (n=49 TM group; n=40 wait-list control group) male inmates in a maximum security prison via a cross-validation study</p> <p>US</p>	<p>Anxiety - State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970)</p> <p>Hostility - Buss-Durkee Hostility Inventory (BDHI; Buss & Durkee, 1957)</p> <p>Extraversion/Introversion - Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1968)</p> <p>Blood pressure – systolic and diastolic – and pulse rate.</p>	<p>Transcendental Meditation - each inmate who was assigned to learn the TM technique was instructed in the same manner. Personal instruction consisted of the assignment of a special meaningless sound or mantra to the individual by the instructor and individualised instruction in the procedure of thinking the mantra effortlessly. The pace of the instruction and</p>	<p>Parallel significant differences between the TM and control groups across all the inventories were found via multivariate analysis of covariance, indicating reduction in anxiety, neuroticism, hostility, and insomnia as a function of the treatment.</p>	<p>Due to custody requirements, only 60% of several hundred interested participants were allowed to attend, and as a result only 120 potential participants were selected from the sign-up list and invited to take part.</p> <p>A lockdown occurred just prior to the planned collection of the sleep and smoking post-survey data for control group 1 resulting in lost data.</p> <p>The assessment battery for the validation sample was an abbreviated version of the one</p>

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
				A sleep and smoking survey.	the specific instructions given are based on the learner's experiences. The following day 3 group meetings were held on consecutive days to verify the correctness of practice and discuss the procedure and the experiences of the learners. 10 days following the third meeting the first of a series of 12 voluntary weekly meetings were held. These meetings included a group meditation,		used on the standardisation sample. Blood pressures and pulses were not taken in control group 2 due to the unavailability of the physicians.

	Paper	Research Method/Design	Participants	Outcome Measures	Intervention	Results and Conclusions	Limitations identified by authors
					discussion of the effects of the programme and question/answer sessions.		

Key: TM = Transcendental Meditation, VM = Vipassana Meditation, MBSR = Mindfulness-Based Stress Reduction, MBCT = Mindfulness-Based Cognitive Therapy, MBRP = Mindfulness-Based Relapse Prevention, MBEI = Mindfulness-Based Emotional Intelligence, REVAMP = Ren-Entry and Values Mindfulness Programme, TAU = Treatment as Usual.

Quality Review

The Quality Assessment Tool for Quantitative Studies (Effective Public Healthcare Panacea Project, 2010) was used to assess the quality of the above papers, and was originally designed to provide a method for assessing the quality of research covering a wide range of health-related topics in order to support public health interventions and research.

The Quality Assessment Tool for Quantitative Studies uses 8 different components (A-F) to assess the quality of a particular piece of research: selection bias, study design, confounders, blinding, data collection method, withdrawals and dropouts, intervention integrity, and analysis. Each component is assessed and given a rating of “strong,” “moderate,” or “weak” based on the criteria outlined in Appendix 1. After each component has been rated, an overall rating of “strong,” “moderate,” or “weak” is given to the research paper based on the composite 8 component ratings to indicate the overall quality of the research paper. In order to capture important information to assess the integrity of the meditation intervention used in each study, in view of some of the known issues with meditation and mindfulness research, the criteria outlined by the EPHPP for the ‘Intervention Integrity’ component was adapted to capture the type of meditation intervention used, whether the intervention followed a protocol, whether fidelity of implementation was assessed, and the training/experience of the instructors delivering the intervention. The original scoring criteria for all 8 components, as well as the adapted scoring for the intervention integrity component, can be found in Appendix 1.

Table 4 summarises the quality review carried out for each of the 21 papers reviewed in this literature review using the EPHPP Quality Assessment Tool for Quantitative Studies.

Table 4 - Summary of quality assessment

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
1	The impact of mindfulness meditation on self-esteem and self-compassion among prisoners (Morley & Fulton, 2020)	Q1 – 3 (Not likely) Q2 – 5 (Can't tell) Rating: Weak	Other – post measures only. No randomisation Rating: Weak	Q1 – 3 (Can't tell) Q2 – 4 (Can't tell) Rating: Weak	Q1- 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 – 4 (N/A) Q2 – 5 (N/A) Rating: N/A	Mindfulness meditation Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Weak	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
2	Mindfulness-Based Relapse Prevention in a Jail Drug Treatment Program (Lyons, Womack, Cantrell & Kenemore, 2019)	Q1 – 1 (Somewhat likely) Q2 – 5 (Can't tell) Rating: Moderate	RCT Was the study described as randomised? - Yes Method of randomisation described? - Yes Was the method appropriate? – Yes Rating: Strong	Q1 – 3 (Can't tell) Q2 - 3 (Can't tell) Rating: Weak	Q1- 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 - 2 (No) Q2 – 2 (50-79%) Rating: Moderate	MBRP Q1 – 1 ((Yes) Q2 – 1 (Yes) Q3 – 3 (Can't tell) Q4 – 3 (Can't tell) Rating: Strong	Q1 - Yes Q2 – No Rating: Strong	MODERATE

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
3	The effect of mindfulness training on mental health in long-term Chinese male prisoners (An et al., 2019)	Q1 – 3 (Very likely) Q2 – 1 (80-100%) Rating: Strong	CCT Was the study described as randomised? - Yes Method of randomisation described? - No Was the method appropriate? – No Rating: Strong	Q1 – 2 (No) Q2 – N/A Rating: Strong	Q1- 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 – 1 (Yes) Q2 – 2 (60-79%) Rating: Moderate	MBCT/MBSR Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	STRONG

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
4	The impact of mindfulness meditation and self-compassion on criminal impulsivity in a prisoner sample (Morley, 2017)	Q1 – 3 (Not likely) Q2 – 5 (Can't tell) Rating: Weak	Other – Correlational study No randomisation Rating: Weak	Q1 – 3 (Can't tell) Q2 - \$ (Can't tell) Rating: Weak	Q1- 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 – 4 (N/A) Q2 – 5 (N/A) Rating: N/A	Mindfulness meditation Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Q3 – 3 (Can't tell) Q4 – 3 (Can't tell) Rating: Weak	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
5	A pilot RCT of a values-based mindfulness group intervention with jail inmates (Malouf et al., 2017)	Q1 – 1 (Very likely) Q2 – 1 (80-100%) Rating: Strong	RCT Was the study described as randomised? - Yes Method of randomisation described? - Yes Was the method appropriate? – Yes Rating: Strong	Q1 – 2 (No) Q2 – N/A Rating: Strong	Q1 – 2 (No) Q2 – 2 (No) Rating: Strong	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 – 1 (Yes) Q2 – 2 (60-79%) Rating: Moderate	REVAMP Q1 – 1 (Yes) Q2 – 1 (Yes) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Strong	Q1 - Yes Q2 – No Rating: Strong	STRONG

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
6	Transcendental meditation and reduced trauma symptoms in female inmates: a randomised controlled study (Nidich et al., 2017)	Q1 – 1 (Very likely) Q2 – 1 (80-100%) Rating: Strong	CCT Was the study described as randomised? - Yes Method of randomisation described? – No Was the method appropriate? – Can't tell Rating: Strong	Q1 – 2 (No) Q2 – N/A Rating: Strong	Q1 – 3 (Can't tell) Q2 – Yes Rating: Moderate	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 – 1 (Yes) Q2 – 1 (80-100%) Rating: Strong	Transcendental meditation Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	STRONG

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
7	Reduced trauma symptoms and perceived stress in male prison inmates through the transcendental meditation program: A RCT (Nidich et al., 2016)	Q1 – 1 (Very likely) Q2 – 2 (80-100%) Rating: Strong	CCT Was the study described as randomised? - Yes Method of randomisation described? – No Was the method appropriate? – Can't tell Rating: Strong	Q1 – 3 (Can't tell) Q2 - 3 (Can't tell) Rating: Weak	Q1- 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 – 1 (Yes) Q2 – 2 (60-79%) Rating: Moderate	Transcendental meditation Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	MODERATE

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
8	The effects of mindfulness training on emotional health in Chinese long-term male prison inmates (Xu et al., 2016)	Q1 – 1 (Very likely) Q2 – 1 (80-100%) Rating: Strong	CCT Was the study described as randomised? - Yes Method of randomisation described? – No Was the method appropriate? – No Rating: Strong	Q1 – 2 (No) Q2 – N/A Rating: Strong	Q1- 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 – 1 (Yes) Q2 – 2 (60-79%) Rating: Moderate	MBCT/MBSR Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	STRONG

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
9	The impact on a mindfulness based program on perceived stress, anxiety, depression and sleep of incarcerated women (Ferszt et al., 2015)	Q1 – 1 (Very likely) Q2 – 4 (N/A) Rating: Strong	Cohort (two groups pre- and post-intervention) Was the study described as randomised? – No Method of randomisation described? – N/A Was the method appropriate? – N/A Rating: Moderate	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Weak	Q1 – 1 (Yes) Q2 – 1 (Yes) Rating: Weak	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 - 2 (No) Q2 – 1 (80-100%) Rating: Strong	MBEI Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
10	Meditation in a deep South prison: A longitudinal study of the effects of Vipassana (Perelman et al., 2012)	Q1 – 3 (Not likely) Q2 – 4 (N/A) Rating: Weak	Cohort analytic (two group pre + post) Was the study described as randomised? – No Method of randomisation described? – N/A Was the method appropriate? – N/A Rating: Moderate	Q1 – 1 (Yes) Q2 – 4 (Can't tell) Rating: Weak	Q1 – 1 (Yes) Q2 – 3 (Can't tell) Rating: Moderate	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q1 - 2 (No) Q2 – 3 (Less than 60%) Rating: Weak	Vipassana meditation Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
11	Psychosocial outcomes of mindfulness-based relapse prevention in incarcerated substance abusers in Taiwan: A preliminary study (Lee et al., 2011)	Q1 – 1 (Very likely) Q4 – (80-100%) Rating: Strong	CCT Was the study described as randomised? – Yes Method of randomisation described? – No Was the method appropriate? – Can't tell Rating: Strong	Q1 – 1 (Yes) Q2 – 1 (8-100%) Rating: Strong	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1- 1 (Yes) Q2 - 1 (Yes) Rating: Strong	Q4 – 5 (N//A) Q2 – 5 (N/A) Rating: N/A	MBRP Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	STRONG

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
12	The benefits of meditation practice in the correctional setting (Sumpter et al., 2009)	Q2 – 2 (Somewhat likely) Q1 – 1 (80-100%) Rating: Moderate	CCT Was the study described as randomised? – Yes Method of randomisation described? – No Was the method appropriate? – Can't tell Rating: Strong	Q1 – 2 (No) Q2 – N/A Rating: Strong	Q1 – 3 (Can't tell) Q2 – 1 (Yes) Rating: Moderate	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Weak	Q4 – 5 (N//A) Q2 – 5 (N/A) Rating: N/A	Eclectic mix of meditation approaches Q1 – 2 (No) Q2 – 2 (No) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Weak	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
13	The role of thought suppression in the relation between mindfulness meditation and alcohol use (Bowen et al., 2007)	Q1 – 3 (Not very likely) Q1 – N/A Rating: Weak	Cohort analytic (two groups pre- and post-intervention) Was the study described as randomised? – No Method of randomisation described? – N/A Was the method appropriate? – N/A Rating: Moderate	Q1 – 2 (No) Q2 – N/A Rating: Strong	Q1 – 1 (Yes) Q2 – 3 (Can't tell) Rating: Moderate	Q1 – 3 (Can't tell) Q2 – 1 (Yes) Rating: Weak	Q1 – 1 (Yes) Q2 – 3 (Less than 60%) Rating: Weak	Vipassana meditation Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 3 (Can't tell) Q4 – 1 (Yes) Rating: Weak	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
14	PTSD symptoms, substance use, and Vipassana meditation among incarcerated individuals (Simpson et al., 2007)	<p>Q1 – 3 (Not very likely)</p> <p>Q1 – N/A</p> <p>Rating: Weak</p>	<p>Cohort analytic (two groups pre- and post-intervention)</p> <p>Was the study described as randomised? – No</p> <p>Method of randomisation described? – N/A</p> <p>Was the method appropriate? – N/A</p> <p>Rating: Moderate</p>	<p>Q1 – 1 (Yes)</p> <p>Q2 – 4 (Can't tell)</p> <p>Rating: Weak</p>	<p>Q1 – 1 (Yes)</p> <p>Q2 – 3 (Can't tell)</p> <p>Rating: Moderate</p>	<p>Q1 – 1 (Yes)</p> <p>Q2 – 1 (Yes)</p> <p>Rating: Strong</p>	<p>Q1 – 1 (Yes)</p> <p>Q2 – 3 (Less than 60%)</p> <p>Rating: Weak</p>	<p>Vipassana meditation</p> <p>Q1 – 1 (Yes)</p> <p>Q2 – 2 (No)</p> <p>Q3 – 3 (Can't tell)</p> <p>Q4 – 1 (Yes)</p> <p>Rating: Weak</p>	<p>Q1 - Yes</p> <p>Q2 – No</p> <p>Rating: Strong</p>	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
15	Mindfulness-based stress reduction in Massachusetts correctional facilities (Samuelson et al., 2007)	Q1 – 2 (Somewhat likely) Q1 – N/A Rating: Moderate	Cohort (one group pre + post) Was the study described as randomised? – No Method of randomisation described? – N/A Was the method appropriate? – N/A Rating: Moderate	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Weak	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1 – 1 (Yes) Q2 – 3 (Can't tell) Rating: Moderate	Q1 – 2 (No) Q2 – 2 (60-79%) Rating: Moderate	MBSR Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 3 (Can't tell) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	MODERATE

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
16	Mindfulness meditation and substance use in an incarcerated population (Bowen et al., 2006)	Q1 – 3 (Not very likely) Q1 – N/A Rating: Weak	Cohort analytic (two groups pre- and post-intervention) Was the study described as randomised? – No Method of randomisation described? – N/A Was the method appropriate? – N/A Rating: Moderate	Q1 – 2 (No) Q2 – N/A Rating: Strong	Q1 – 1 (Yes) Q2 – 3 (Can't tell) Rating: Moderate	Q1 – 3 (Can't tell) Q2 – 1 (Yes) Rating: Weak	Q1 – 1 (Yes) Q2 – 3 (Less than 60%) Rating: Weak	Vipassana meditation Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 3 (Can't tell) Q4 – 1 (Yes) Rating: Weak	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
17	Effects of the Transcendental Meditation Program on Recidivism Among former inmates of Folsom Prison: Survival analysis of 15 year follow-up data (Rainforth et al., 2003)	Q1 – 3 (Not likely) Q2 – N/A Rating: Weak	Case-control Was the study described as randomised? – No Method of randomisation described? – N/A Was the method appropriate? – N/A Rating: Moderate	Q1 – Yes Q2 – 1 (80-100%) Rating: Strong	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1 – 1 (Yes) Q2 – 1 (Yes) Rating: Strong	Q1 – No Q1 – 1 (80-100%) Rating: Strong	Transcendental meditation Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 3 (Can't tell) Q4 – 1 (Yes) Rating: Weak	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
18	Consciousness-Based rehabilitation of inmates in the Netherlands Antilles: Psychosocial and cognitive changes (Hawkins et al., 2003)	Q1 – 3 (Not likely) Q2 – N/A Rating: Weak	Cohort analytic (two groups pre- and post-intervention) Was the study described as randomised? – No Method of randomisation described? – N/A Was the method appropriate? – N/A Rating: Moderate	Q1 – 2 (No) Q2 – N/A Rating: Strong	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1 – 2 (No) Q2 – 2 (No) Rating: Weak	Q1 – 2 (No) Q2 – 3 (Less than 60%) Rating: Weak	Transcendental meditation Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 3 (Can't tell) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
19	The Transcendental Meditation program and criminal recidivism in California (Bleick & Abrams, 1987)	Q1 – 3 (Not likely) Q2 – N/A Rating: Weak	Case-control Was the study described as randomised? – No Method of randomisation described? – N/A Was the method appropriate? – N/A Rating: Moderate	Q1 – 1 (Yes) Q2 – 1 (80-100%) Rating: Strong	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1 – 1 (Yes) Q2 – 1 (Yes) Rating: Strong	Q1 – N/A Q2 – N/A Rating: N/A	Transcendental meditation Q1 – 1 (Yes) Q2 – 2 (No) Q3 – 3 (Can't tell) Q4 – 1 (Yes) Rating: Weak	Q1 - Yes Q2 – No Rating: Strong	WEAK

	Study (Authors and Date)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Intervention Integrity	Analysis	Global Rating
21	The Transcendental Meditation program and rehabilitation at Folsom State Prison: A cross-validation study (Abrams & Siegel, 1978)	Q1 – 2 (Not likely) Q2 – 1 (80-100%) Rating: Weak	CCT Was the study described as randomised? – No Method of randomisation described? – N/A Was the method appropriate? – N/A Rating: Strong	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Weak	Q1 – 3 (Can't tell) Q2 – 3 (Can't tell) Rating: Moderate	Q1 – 2 (No) Q2 – 2 (No) Rating: Weak	Q1 – 1 (Yes) Q2 – 2 (60-79%) Rating: Moderate	Transcendental Meditation Q1 – 1 (Yes) Q2 – 3 (Can't tell) Q3 – 1 (Yes) Q4 – 3 (Can't tell) Rating: Moderate	Q1 - Yes Q2 – No Rating: Strong	WEAK

Summary of Study Findings

Of the 21 studies that were reviewed in this literature review, 5 papers received a global rating of 'strong', 3 studies received a global rating of 'moderate', and 13 studies received a global rating of 'weak'. Table 5 provides an overview of the global and component ratings for the 21 studies included in this review.

Table 5 - Overview of global and component ratings for the 21 studies included in the review

Global Rating/ Component Rating	Strong	Moderate	Weak	N/A
Global Rating	5 (23.8%)	3 (14.3%)	13 (61.9%)	
Selection Bias	7 (33.3%)	3 (14.3%)	11 (52.4%)	
Study Design	9 (42.9%)	10 (47.6%)	2 (9.5%)	
Confounders	11(52.4%)	0 (0%)	10 (47.6%)	
Blinding	1 (4.8%)	19 (90.4%)	1 (4.8%)	
Data Collection Method	15 (71.4%)	0 (0%)	6 (28.6%)	
Withdrawals and Dropouts	3 (14.3%)	7 (33.3%)	6 (28.6%)	5(23.8%)
Intervention Integrity	2 (9.5%)	10 (47.6%)	9 (42.9%)	
Analysis	21 (100%)	0 (0%)	0 (0%)	

The findings from this study for the main outcomes of psychological and physical wellbeing, criminogenic needs, and recidivism are discussed under the main themes of: type of mindfulness intervention, gender and security level, and length of meditation.

Meditation Intervention

Transcendental meditation

One of the first types of meditation to be studied in correctional settings was Transcendental Meditation (Abrams & Siegel, 1978). In the current review, 6 studies looked at TM between 1978 and 2016 (Abrams & Siegel, 1978; Bleick & Abrams, 1987; Hawkins et

al., 2003; Rainforth et al., 2003; Nidich et al., 2016; Nidich et al., 2017), and have explored all three categories of outcomes: psychological and physical wellbeing, criminogenic needs, and recidivism. In the two most recent studies on TM (Nidich et al., 2016; Nidich et al., 2017), significant reductions in trauma symptoms in both males and females in medium and maximum-security prisons, as well as in trauma-related problems such as anxiety, depression, dissociation, sleep disturbance and perceived stress in the female sample were found. One of these studies received an overall quality rating of 'strong' (Nidich et al., 2017) and the other study received a rating of 'moderate' (Nidich et al., 2016), indicating good support for the above findings. However, one of the studies used a relatively small sample size (n=22; Nidich et al., 2017) and the other study used a no-treatment control group as opposed to an active control group (Nidich et al., 2016), resulting in the possibility that some of the benefits associated with the meditation group were not specific to TM. The other 4 studies of TM (Abrams & Siegel, 1978; Bleick & Abrams, 1987; Hawkins et al., 2003; Rainforth et al., 2003) all found improvements in psychological and physical wellbeing (anxiety, neuroticism, insomnia), criminogenic needs (hostility and cognitive distortion), and lower recidivism at 1 year, at 6 months to 6 years after parole, and at 15-year follow up, as well as showing more favourable parole outcomes than state-wide parolees. One of these studies, however, used secondary data for their analysis (Rainforth et al., 2003), and all four studies received overall 'weak' ratings due to significant issues with selection bias, confounders, data collection methods, intervention integrity, and withdrawals and dropouts. Due to the significant methodological issues in these four studies, any conclusions drawn from these studies must be made with caution.

Vipassana meditation

Another type of meditation to be explored within correctional studies was Vipassana meditation. 4 studies in this current review used Vipassana meditation as the experimental intervention (Bowen et al., 2006; Simpson et al., 2007; Bowen et al., 2007; Perelman et al., 2012). These studies found reductions in alcohol and drug use, less psychological distress, greater alcohol-related internal locus of control, greater optimism, decreased thought suppression that partially mediated the effects of VM on post-release alcohol use and consequences 3 months following release from jail, enhanced levels of mindfulness and emotional intelligence and decreased mood disturbance, and a reduction in behavioural infractions at 1 year follow up. However 2 of the 4 studies used secondary data for their analysis (Bowen et al., 2007; Simpson et al., 2007), and all 4 of the studies were given an overall rating of 'weak' due to issues relating to selection bias, confounders, data collection method, withdrawals and dropouts, and intervention integrity.

Mindfulness-based interventions (MBIs)

The more recent type of meditation to be used in correctional studies are mindfulness-based interventions. 9 studies used a mindfulness-based intervention in this literature review: 7 of which were described as structured, protocol-driven mindfulness-based interventions (e.g., MBSR, MBCT, MBRP, REVAMP, MBEI) (An et al., 2017; Ferszt et al., 2015; Lee et al., 2011; Lyons et al., 2019; Malouf et al., 2017; Samuelson et al., 2007; Xu et al., 2016), and 2 of which were referred to as 'mindfulness meditation' but did not expand on this (Morley, 2017; Morley & Fulton, 2020).

One MBSR study found significant pre- to post-programme improvements on measures of hostility, self-esteem, and mood disturbance in both male and female samples (Samuelson et al. 2007). 2 studies used MBRP with offenders with a history of substance abuse and found significantly higher negative expectancies of substance use and levels of mindfulness, and decreased depressive mood, cravings for substances, and anxiety (Lee et al., 2011; Lyons et al., 2019). 2 studies used MBCT in long-term Chinese male prisoners and found significant improvements in mindfulness level, perceived stress, mental health symptoms (somatisation, obsessive-compulsive, interpersonal anxiety, depression, tension-anxiety, phobic anxiety, paranoid ideation, psychoticism, depression-dejection, confusion-bewilderment, and total mood disturbance) and criminogenic needs (anger-hostility, interpersonal sensitivity) (An et al., 2019; Xu et al., 2016;). One study used REVAMP and found increases in willingness/acceptance, self-judgement, and shame on completion of the programme, with increases in willingness/acceptance found to persist at 3-month post-release. There was also a marginally significant trend of medium effect size for lower recidivism in the REVAMP group (Malouf et al., 2017). One study used the MBEI training programme in a female only sample and found significantly less stress, anxiety, and depression (Ferszt et al., 2015).

Two studies reported using a mindfulness meditation programme in their studies, however the intervention was not described in the study, and it is therefore unclear what each intervention consisted of (Morley, 2017; Morley & Fulton, 2020). Despite this however, in one of the studies self-compassion was found to be a negative predictor of criminal impulsivity and to partially mediate the relationship between the practice of meditation and criminal impulsivity (Morley, 2017). In the other study, participants who practiced

mindfulness meditation for 4 weeks or more were found to have higher self-esteem, self-compassion and feel less isolation than the control group (Morley & Fulton, 2020).

With regards to quality assessment, the more structured, protocol-based interventions were rated as mostly 'strong' (n=4; An et al., 2019; Lee et al., 2011; Malouf et al., 2017; Xu et al., 2016) or 'moderate' (n=2; Lyons et al., 2019; Samuelson et al., 2007) quality overall, with the exception of the MBEI intervention which was given an overall rating of 'weak' due to issues with confounders and blinding (Ferszt et al., 2015). The overall higher quality of research in this subsection of the meditation intervention possibly reflects advances in methodological rigor as these studies represented more current research that has been conducted within the last 13 years, with only two of the studies using structured, protocol-driven interventions receiving one component rating of 'weak' out of the 8 components assessed (Samuelson et al., 2007; Lyons et al., 2019), both of which were due to important differences between groups prior to the intervention not being reported in the studies.

The two mindfulness meditation interventions that did not report the details of the intervention received an overall rating of 'weak' as these had significant issues with selection bias, study design and confounders, despite these studies being carried out more recently (Morley, 2017; Morley & Fulton, 2020). This was mainly due to the sample used being participants that were either already practicing mindfulness or on the wait-list to practice mindfulness meditation at the time of conducting the research. In terms of study design, one study used a correlational design (Morley, 2017) and the other used post-measures only and did not randomise participants into the experimental and wait-list control groups (Morley & Fulton, 2020). Again, neither study reported whether there were

important differences between the groups in terms of potential confounds such as age, race, ethnicity or education level.

Mixed meditation

One study conducted in 1983 used a variety of meditation approaches which covered Yogic disciplines of open concentration, attentiveness and imagery; Christian and Islamic prayer; and Tibetan, Zen and other Buddhist approaches (Rhead & May, 1983). In this study it was found that the meditation group showed a significant reduction in global symptomatology, obsessive-compulsive, anxiety and psychoticism on one measure, and on another measure were found to be more forthright, more relaxed, less anxious depression, high energy euphoria, low schizophrenia, and low psychasthenia. Therapist reports also reflected a reduction in psychopathology and more adequate functioning in therapy, but these did not reach statistical significance. Alongside issues with the variability of meditative techniques used and the absence of measurement of the consistency of the intervention, there were also significant issues within this study relating to selection bias, confounders, data collection methods, and withdrawals and dropouts. This study was also carried out within a psychiatric prison, whereby each resident attends group psychotherapy at least once a week. Whilst this was acknowledged in the paper, this wasn't incorporated into the study design and analysis, which leaves the potential for any changes in participants to be partly attributable to 'treatment as usual'. In view of these significant methodological issues, this study was given an overall rating of 'weak'.

The second study offered a meditation programme to female only participants which consisted of counting in breaths and out breaths, repeating a phrase or mantra (which was self-selected), walking meditation, and moving meditation (simple yoga postures) (Sumpter

et al., 2009). This was termed a structured meditation programme because the facilitators took an active role in introducing and talking about meditation practices rather than just sitting together in quiet without instruction or discussion. This study found participants experienced fewer sleeping difficulties, less desire to throw things or hit people, and less nail or cuticle biting, were more hopeful about their future, and felt less guilt. Alongside the absence of a reported protocol for the intervention or measure of the consistency of the intervention, there were also issues with the data collection methods. Similar to the above study, this research was also carried out in a unique setting whereby there was a silence requirement of the facility where detainees were not allowed to talk unless permission was granted, which meant that participants had already experienced a period of quiet time and had the opportunity to begin the introspection process before starting the intervention, which could partly explain any benefits observed in participants rather than the meditation intervention. As a result of these issues, this study was also given an overall rating of 'weak'.

Gender and Security Level

Samuelson et al. (2007) found that improvements on self-report measures of hostility, self-esteem, and mood disturbance were greater for women than those for men after completing an MBSR course, and that improvements were also greater for men in a minimum-security, pre-release facility than for those in four medium-security facilities. Whilst this study received an overall rating of 'moderate', the confounders' component for this study was rated as 'weak'.

Length of meditation

Morely & Fulton (2020) found that more experienced meditators (greater than 4 weeks participation in meditation classes) had higher self-esteem, self-compassion and felt less isolation than the less experienced meditation group (fewer than 4 weeks participation in meditation classes) and the control group; however conversely they also found that the less experienced meditation group experienced lower self-esteem and self-compassion compared to the control group. The authors also found that self-kindness was higher among the more experienced meditators, however this finding was not significant (Morley & Fulton, 2020). Morely (2017) also found that the number of weeks of meditation was a negative predictor of criminal impulsivity. However it is important to note that both of these studies received an overall rating of 'weak' due to significant issues relating to selection bias, study design, confounders and intervention integrity.

Discussion

The discussion section will provide a broad summary of the literature in an attempt to answer the three main aims of this literature review, which were:

1. To assess the quality of research of studies examining different meditative approaches in correctional settings and to examine whether the quality of the research in this area has improved over time.
2. To outline the findings of research into meditative approaches in correctional settings in terms of psychological and physical wellbeing, criminogenic needs, and recidivism.
3. To make recommendations for future research to help develop the evidence base for meditative approaches in correctional settings.

Quality of research studies

As shown in the results section, out of 21 studies 5 papers received a global rating of 'strong' (23.8%), 3 studies received a global rating of 'moderate' (14.3%), and 13 studies received a global rating of 'weak' (61.9%). In terms of meditative approach, there were a larger number of studies exploring MBIs (n=9) which, on average, were of better quality, whereby 4 studies were rated as 'strong' (44.4%), 2 studies were rated as 'moderate' (22.2%), and 3 studies were rated as 'weak' (33.3%). In terms of VM, all 4 studies (100%) were rated as 'weak'. In terms of TM, 1 study was rated as 'strong' (16.6%), 1 study was rated as 'moderate' (16.6%), and 4 studies were rated as 'weak' (66.6%). In terms of mixed meditation approaches, both studies received a rating of 'weak' (100%).

Of note, all of the MBI studies were conducted between 2007 and 2020, whereas the majority of research studies that explored TM, VM or mixed mediation approaches were conducted prior to 2010. This likely reflects the growing popularity of MBIs over the last two decades (Van Dam et al., 2017) and advances in methodological rigor in mindfulness research, which has been a consistent criticism of reviews that have explored research studies carried out in correctional studies exploring meditative approaches in this population (Auty et al., 2017; Chiesa, 2010; Dafoe & Stermac, 2013; Himelstein, 2011; Lyons & Cantrell, 2016; Per et al. 2020; Shonin et al., 2013). Whilst there appears to be a general trend of improvements in the quality of research carried out over time, particularly since 2011, there have still been significant methodological issues in contemporary meditative research studies in correctional populations, with very few robust RCTs being conducted in this area of research. In this systematic review, of the 21 studies that met the inclusion criteria, the higher percentages of 'weak' ratings given to studies were in the following areas: selection bias (52.4%), confounders (47.6%), intervention integrity (42.9%) data collection methods (28.6%), withdrawals and dropouts (28.6%).

Several reviews acknowledge the difficulties of conducting high quality meditative research, particularly RCTs, in correctional settings (Auty et al., 2017; Per et al. 2020; Shonin et al., 2013). As part of a systematic review and meta-analysis of outcomes of psychological therapies for prisoners with mental health problems, a thematic analysis on the difficulties of conducting RCTs in prisons was conducted on 37 studies from 7 different countries (Yoon, Slade & Fazel, 2017). The main themes that were identified were post-treatment follow-up and institutional constraints. The most common theme was difficulties with post-treatment follow-up because of high rates of release, rapid turnover of prisoners, short duration of

stay, and with difficulties in ensuring continuity of care. The second most commonly identified problem was institutional constraints which reflected two main subcategories: constraints on the scheduling of sessions (e.g., scheduling conflicts with other activities and 'lock downs'), high attrition rates (partly attributable to scheduling changes) and inmate infractions that restricted enrolment into treatment programmes. The second subtheme – constraints on the implementation of proposed individual study characteristics – covered a broad range including policies against gathering biological markers or video recording and controlling for changes in the social environment of the prison (Yoon, Slade & Fazel, 2017).

Outcome measures

Psychological and Physical Wellbeing

Out of the 19 studies that examined the impact of different meditative approaches on psychological wellbeing in correctional settings, all 19 reported beneficial outcomes in the following psychological wellbeing outcomes: anxiety/neuroticism, depression, stress, PTSD/trauma symptoms, mood disturbance, paranoid ideation, psychoticism, somatisation, obsessive-compulsive symptoms, phobic anxiety, tension, confusion-bewilderment, and dejection.

Three studies found that TM (Abrams & Siegel, 1978; Nidich et al., 2016) and a mixed meditation intervention (Sumpter et al., 2009) led to improvements in sleep. Other outcomes which were measured but for which no significant difference were found were blood pressure and pulse rate, smoking, and physical symptoms such as visual symptoms, aches, numbness and chest pain (Abrams & Siegel, 1978; Sumpter, 2009).

Whilst the quality of this research is mixed, these findings are consistent with previous reviews of meditative approaches in correctional settings, which have also documented the benefits of using different meditative approaches on psychological wellbeing in offender populations (Auty et al., 2017; Chiesa, 2010; Dafoe & Stermac, 2013; Himelstein, 2011; Lyons & Cantrell, 2016; Per et al. 2020; Shonin et al., 2013)

In addition to the above, Malouf et al. (2017) found that the REVAMP intervention resulted in increased willingness/acceptance (a core mindfulness dimension) in the active treatment group, and that these increases persisted at 3-month post-release. Whilst this could be argued as an outcome of psychological wellbeing in and of itself, this could also be a proposed mechanism of change in some of the other psychological wellbeing outcomes measured. Indeed, there is evidence to suggest that willingness/acceptance is related to less psychopathology and greater wellbeing (Hayes et al., 2006) and is an essential component to positive behaviour change (Linehan, 1993).

Also of note, whilst Malouf et al. (2017) found increases in willingness/acceptance in the active treatment group, they also found increases in self-judgment and shame relative to the control group. The authors suggest that whilst these findings might seem counterintuitive, an increase in willingness/acceptance may have helped inmates overcome experiential avoidance related to their offending, which can often lead to externalisation of blame, denial, and which can act as barrier to individuals being able to reflect on past behaviour and learn from this (Malouf et al., 2017). Tangney et al., (2014) also found that shame exerted a significant indirect positive effect on subsequent recidivism in their longitudinal study of 508 jail inmates charged with felonies, which again could be argued may have assisted in offenders engaging in positive behavioural change.

Criminogenic needs

Out of the 13 studies that examined the impact of different meditative approaches on criminogenic needs in correctional settings, all 13 reported beneficial outcomes in the following areas related to criminogenic needs: anger/hostility, cognitive distortions, self-esteem, criminal impulsivity, substance misuse (drugs and alcohol), the desire to throw things or hit people, and behavioural infractions at one-year follow-up.

In addition, Morley (2017) found that the number of weeks of mindfulness meditation predicted criminal impulsivity, and that self-compassion was also found to predict criminal impulsivity and partially mediate the relationship between the practice of meditation and criminal impulsivity. This finding is of interest as another potential mechanism of change, which has also been advocated as having utility in offender populations (Shonin et al., 2013).

Of note however, Morley & Fulton (2020) did find that the less experienced meditation group (less than 4 weeks) experienced lower self-esteem and self-compassion compared to the control group. This highlights concerns raised that research into adverse effects in meditative research is under-developed (Van Gordon et al., 2015).

Recidivism

Out of the 3 studies that examined the impact of different meditative approaches on recidivism, two studies of TM found statistically significant findings with respect to more favourable parole outcomes and adjudication sheets 1-5 years after parole and reduced recidivism at 1 year and 6 months to 6 years after parole (Bleick & Adams, 1987) and at 15

year follow-up (Rainforth et al., 2003). Malouf et al., (2017) found marginally statistically significant trend for lower criminal recidivism in the REVAMP group compared to TAU.

A number of problems in measuring recidivism that have been highlighted, which include definitions of outcomes varying (e.g. re-arrest, reoffending, re-imprisonment), differences in samples (e.g. offenders, prisoners, individuals from open or closed institutions), and a lack of consistent follow-up times being used. As a result, comparisons between countries can be difficult (Fazel & Wolf, 2015).

Strengths and Limitations of Current Review

Methodological Strengths and Limitations

One methodological strength is that a number of different meditative approaches have been included in an attempt to bring together the literature to be able to compare and contrast these different approaches. Previous review have tended to focus on either VM or MBIs, or VM and MBIs, and excluded TM (Auty et al., 2017; Chiesa, 2010; Lyons & Cantrell, 2016; Per et al. 2020; Shonin et al., 2013).

Another methodological strength of this current review is that a quality assessment tool was applied to all studies in a systematic way in order to assess the quality of the literature in this area and the conclusions drawn from these studies. Previous reviews that have looked at TM, VM and MBIs have been narrative reviews which have not used a quality assessment tool to assess the quality of the literature (Dafoe & Stermac, 2013; Himmelstein, 2011).

In terms of the studies that were included in the review, one strength is that positive findings for meditative approaches was found in a variety of different countries, despite the

fact that prison culture and conditions are known to widely vary from country to country (MOJ, 2012). In addition, studies included males and female and differing security levels. This suggests a level of robustness to the findings and improves the generalisability of the research.

There are however a number of methodological limitations to this review. Firstly, this review did not explore meditative approaches in adolescent populations in correctional settings and did not include qualitative studies. As there are several studies that have conducted qualitative research in this area (Bouw et al., 2019; Ranganathan et al., 2008; Ronel et al., 2013), and a number of reviews exist exploring the utility of meditative approaches in juvenile offenders (Murray et al., 2019; Zoogman et al., 2015), important findings from this research may have been excluded in this review. Also excluded from this review were studies that were published in a language other than English, along with research theses and unpublished research, which may have also led to the omission of important empirical evidence in this current review.

With regards to quality of the research, whilst a good number of studies included in this review were rated overall as 'strong', 61.9% of the studies were rated as 'weak'. This finding is line with previous reviews that have warned that whilst meditative approaches show promise in this population, significant methodological issues in the studies undermines some of these findings which need to be interpreted with caution (Van Dam et al., 2017).

As a meta-analysis was not carried out in this review due to the low number of RCTs and the heterogeneity of the outcome measures used, effect sizes were not calculated to

indicate whether any of the significant differences found in the included studies were meaningful.

Implications for Forensic Clinical Psychology

The focus on psychological and physical wellbeing and criminogenic needs and recidivism in the literature on meditative research in correctional settings is representative of important debates present in forensic clinical psychology. One such debate is risk management approaches, such as the Risk-Need-Responsivity model (RNR; Andrews & Bonta, 2010) versus strengths-based approaches to rehabilitation in offenders, such as the Good Lives Model (Ward & Stewart, 2003). For example, the RNR model distinguishes between criminogenic and non-criminogenic needs and refers to the main criminogenic risk factors as the 'central eight' (criminal history, pro-criminal attitudes, pro-criminal associates, antisocial personality pattern, family/marital, school/work, substance abuse, and leisure/recreation). Bonta & Andrews (2016) have stated that interventions that target more criminogenic needs relative to non-criminogenic needs lower the recidivism rate, whereas programmes that predominantly target non-criminogenic needs (such as self-esteem, feelings of personal distress, major mental disorder, and physical health) are associated with increased crime. However, one of the main criticisms of the RNR model is that non-criminogenic needs are disregarded in the model (Basanta et al., 2018) and that the RNR model takes a reductionist approach (Ward & Maruna, 2007) and dismisses the crucial importance of human needs and their influence in determining offending behaviour (Ward et al., 2007). It could be argued that the literature on meditative research in correctional settings addresses important issues in both of these approaches, and could represent one area in forensic clinical psychology that tries to integrate both risk management in terms of

criminogenic needs and recidivism and human needs in terms of psychological and physical wellbeing.

One important consideration is the risk of adverse effects of meditative approaches in this population. More generally, adverse effects of meditation have reported to include psychotic episodes, painful kinesthetic sensations, addiction to meditation, anti-social behaviour, impaired reality testing, dissociation, despair, and exhaustion (Shonin et al., 2014). Indeed, Van Dam et al. (2017) highlights that numerous authors have recommended that schizophrenia spectrum disorders, bipolar disorder, posttraumatic stress disorder, depression, and risk factors for psychosis (e.g., schizoid personality disorder) are contraindications to participation in an MBI that is not specifically tailored to one of these conditions. Witharana & Adshead (2013) warn of the importance of being aware of the potential adverse effects of meditation in this population in medico-legally sensitive environments such as forensic clinical environments.

There have also been concerns raised around the cultural acceptability of meditative approaches in correctional settings, particularly as psychological practice can often be underpinned by values that are punishment-oriented (Howells et al., 2010). However as illustrated in this review, a number of studies have implemented meditative interventions within correctional settings with apparent success and many meditative interventions are delivered in as secularised format. Of note, second-generation mindfulness-based interventions (SG-MBIs) are being advocated more generally in the mindfulness literature, which incorporate more traditional Buddhist teachings such as ethical awareness, impermanence, emptiness/non-self, loving-kindness and compassion meditation (Van Gordon et al., 2015). On the surface it would appear that SG-MBIs could complement

rehabilitation models such as the Good Lives Model and third wave therapies used in forensic clinical settings such as Dialectical Behaviour Therapy (DBT; Linehan, 1993), Acceptance and Commitment Therapy (ACT; Hayes et al. 1999) and Compassion-Focused Therapy (CFT; Gilbert, 2009), and could therefore warrant further exploration.

A further implication is that meditative approaches could be beneficial in helping staff to manage the challenges of working in these environments. Elliot & Day (2003) highlight that forensic health care professionals are often assumed to be at greater risk of occupational stress , and both MBSR and MBCT have been shown to lead to reductions in emotional distress, stress and burnout in health care professionals when practiced regularly (Brady et al., 2012; Cohen-Katz et al., 2005a; Cohen-Katz et al., 2005b; De Zoysa, et al., 2014a, 2014b; Ruths et al., 2013; Shapiro et al., 2005; Shapiro et al., 2007).

Recommendations for future research

Due to the highlighted methodological issues in conducting meditative research in correctional settings, the field would benefit from further research in this area which takes into account the following: using an active control rather than an inactive control, assessing adherence to practice and fidelity of implementation, obtaining qualitative feedback from participants, including longer follow-up periods, and including more objective outcome measures rather than relying solely on self-report methods.

Another area for future research would be to compare meditative approaches to identify the comparative effects of each approach, provide useful insight into any significant differences between the different approaches, and to identify the mechanisms of change.

Whilst studies have looked at gender and different security levels, it would be interesting to explore the effectiveness of meditative approaches in terms of offence-type and/or mental health needs, as well as to explore predictors of the effectiveness of meditative approaches in this population. Finally, further research on meditative approaches and recidivism is warranted due to the lack of research in this area.

Conclusions

Whilst meditation approaches have been shown to be beneficial in offender populations with regards to psychological and physical wellbeing, criminogenic needs and recidivism, further high quality research is needed to be able to confirm these findings. There is however the potential for meditative approaches in correctional settings to have far reaching consequences for both the wellbeing of the prisoner and the protection of the public in reducing future re-offending.

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CHAPTER 2

EMPIRICAL PAPER

THE VALIDATION OF A MEASURE OF A BUDDHIST-DERIVED CONCEPT OF MINDFULNESS (INSIGHT) IN A UK UNDERGRADUATE UNIVERSITY SAMPLE

Abstract

Introduction

One criticism of mindfulness-based interventions (MBIs) in Western societies is that mindfulness skills are being taught separately from the Buddhist teachings from which mindfulness originated that are thought to contribute towards the effectiveness of mindfulness-based approaches. One such Buddhist teaching is that of 'insight' into the three characteristics of human existence: *Dukkha* (suffering is an inevitable part of life), *Anicca* (everything is impermanent), and *Anatta* (there is no true existence of a separate self). As there is currently no validated measure of Buddhist insight, this study aimed to validate a measure of Buddhist insight, the Cognitive Insight Scale (CIS), in a UK undergraduate university sample.

Method

484 undergraduate students were asked to complete the CIS along with 6 additional questionnaires measuring levels of mindfulness and wellbeing online. An exploratory factor analysis was performed to produce the initial factor structure for the measure. Next a confirmatory factor analysis was conducted to validate the factor structure identified from the exploratory factor analysis. Normative and reliability data, along with convergent validity, was subsequently established for the resultant CIS measure.

Results

The exploratory factor analysis yielded a final 24-item, 5 factor model, derived from an initial 7 factor solution model, which was shown to provide the best fit to the data from a statistical perspective. A confirmatory factor analysis showed that the 5 factor model was a

'moderate' fit to the data and was accepted as the best fit to the data. Significant differences in overall CIS and subscales scores were found for gender, age and meditation practice. The CIS was found to have good reliability and convergent validity.

Conclusions

Whilst these initial findings show promise, future research is needed to confirm whether the CIS is an accurate measure of Buddhist insight in Western cultures. Future research is needed to validate such a measure in both Eastern and Western cultures, and in various populations within cultures.

Introduction

Since the early 2000s there has been a significant amount of research within the field of mindfulness in the areas of health, education, the workplace and the criminal justice system (MAPPG, 2015). Mindfulness has been positioned as either a central tenant in ‘third wave’ psychological therapies such as Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 2003), Mindfulness-Based Cognitive Therapy (MBCT; Segal et al, 2002) and Mindfulness-Based Relapse Prevention (MBRP; Marlatt & Kristeller, 1999) or a significant component of therapies such as Dialectical Behaviour Therapy (DBT; Linehan, 1993) and Acceptance and Commitment Therapy (ACT; Hayes et al. 1999).

Whilst there are a number of definitions of mindfulness that exist, due to the variability across contemporary Mindfulness-Based Interventions (MBIs), it has been suggested that the term ‘mindfulness’ has now become an umbrella term used to characterise a large number of practices, processes, and characteristics, largely defined in relation to the capacities of attention, awareness, memory/retention, and acceptance/discernment (Van Dam et al., 2017).

With an increase in mindfulness research, there have however been concerns raised surrounding the difficulties in defining mindfulness and methodological issues in the mindfulness research. Indeed, Van Dam et al., 2017 warned these difficulties “may lead public consumers to be harmed, misled, and disappointed” in respect to mindfulness (Van Dam et al. 2017, p. 1)

One significant criticism of MBIs such as MBSR, MBCT and MBRP, which have been coined First-Generation MBIs (FG-MBIs), is that these interventions have been far removed

from their Buddhist roots. This has led some authors to question whether contemporary mindfulness interventions are inaccurate and/or misleading by referring to the techniques used as 'mindfulness' (Van Gordon et al., 2015).

In developing MBSR as a Western psychological treatment, Jon Kabat-Zinn described the tension between making mindfulness acceptable in Western society whilst still respecting central aspects of the Buddhist traditions about the use of mindfulness (Williams & Kabat-Zinn, 2011). The reasoning therefore behind teaching mindfulness as a set of skills with little reference to the Buddhist teachings from which it originated was to ensure that MBIs were deemed to be culturally acceptable and not seen as religious, but as secular and scientific.

However, whilst FG-MBIs have been helpful in gaining acceptance in Western society there is now a call for the development of Second-Generation MBIs (SG-MBIs). These are distinguished from FG-MBI's through advocating an 'active' rather than 'non-judgemental' form of awareness, incorporating the notion of spirituality, and teaching mindfulness in conjunction with other meditative practices and principles that are traditionally deemed to promote effective mindfulness practice (Van Gordon et al. 2015) - key of which is 'insight' (Grabovac et al. 2011).

'Insight' within the Buddhist traditions refers to a "non-conceptual, experiential form of understanding that results in lasting reductions in attachment and mental proliferation" (Grabovac, 2015, p. 591) of the nature of human existence through the 'three characteristics of existence': *Dukkha* (suffering is an inevitable part of life), *Anicca* (everything is impermanent), and *Anatta* (there is no true existence of a separate self) (Grabovac et al. 2011). In Buddhist tradition, developing insight into these three characteristics of existence

is facilitated by mindful meditation upon mindfulness of the body (*Kaya*), mindfulness of sensations and feelings (*Vedana*), mindfulness of consciousness and thoughts (*Citta*), and mindfulness of natural phenomena (*Dhamma*) (Wallace, 2011). The practice of mindfulness alongside the teachings of the three characteristics of existence is said to promote psychological wellbeing and reduce psychological distress (Grabovac et al., 2011).

A number of randomised controlled studies have demonstrated that SG-MBIs can be effective treatments for depression, anxiety and stress, schizophrenia, pathological gambling, work addiction, work-related stress, nicotine dependence, anger dysregulation and antisocial behaviour (Shonin & Van Gordon, 2015). A study by Jarukasemthawee et al. (2019) found, in a RCT with 141 Thai participants and an uncontrolled trial with 96 Australian participants, that a SG-MBI developed by the authors (the Insight-Based Mindfulness Programme; IBMP) improved wellbeing and mindfulness, developed key insights, and reduced psychological distress.

Although research would appear to support the use of SG-MBIs, it is still unknown whether the beneficial changes that are documented are a direct consequence of changes in insight. A valid self-report instrument for the specific measurement of insight in relation to the three characteristics of existence has not yet been developed, and yet, to ensure a rigorous scientific research-base (which is one of the conditions of acceptability), the development of satisfactory measures of such key components is required (Van Dam et al. 2017).

In an attempt to address this, Jarukasemthawee et al. (2020) developed the Cognitive Insight Scale (CIS) using a Thai sample, which was designed to measure insight of the three Buddhist characteristics of existence – suffering, impermanence and non-self

attachment. The results of this study showed that there was evidence for three separate factors corresponding to the three characteristics of existence and that this measure showed good internal consistency, test-retest reliability, and criterion validity. However, this measure has not yet been validated in other cultures in which the Buddhist notion of insight is less commonplace, and there is therefore the possibility that the factor structure may differ in other cultures due to differences in the way mindfulness is understood, taught and practised in Western societies.

The aim of this research is therefore to extend the research carried out by Jarukasemthawee et al. (2020) to validate the CIS in a UK undergraduate university sample. In establishing a reliable and valid measure of insight, the CIS can help further the development of research into SG-MBI's across cultures in order to establish the effectiveness of these approaches and test the underpinning mechanisms through which change may occur.

Method

Development of the CIS Items

The initial development of the 44-item version of the CIS, which is described below, was carried out by Jarukasemthawee et al. (2020) prior to the author's involvement in this study. The development of the CIS was consistent with the standards for scale construction recommended by Simms (2008). An initial pool of items was created following a systematic review of Thai and English Buddhist teachings and literatures relating to the three characteristics of existence. A total of 60 Thai language items were initially created, which related to one of the three characteristics of existence. A procedure in scale translation proposed by Brislin (1970) was used whereby a person who is bilingual in English and Thai translated the initial items from Thai to English, and a second bilingual person independently translated the English version back to Thai. The original and back-translated questionnaires were compared and discrepancies were discussed and used to refine the translation. The initial 60 items were then evaluated by five psychologists with long-term experience in Buddhist psychology for appropriateness of specificity for conceptualisation of the three characteristics of existence, accuracy of content, and ease of comprehension. The experts also offered their own suggestions of revised item wordings. Sixteen items were excluded due to the fact that these were thought to represent more than one aspect of the three characteristics of existence. This resulted in 44 remaining items that were thought to relate to one of the three characteristics of existence: suffering (13 items), impermanence (17 items), and non-self attachment (14 items) on which the exploratory factor analysis was performed. 13 of these items were reversed scored (Items 9, 13, 14, 20, 25, 29, 31, 35, 39, 40, 41, 42, 44). A copy of the initial 44 item CIS can be found in Appendix 2. Each item is

rated on a six-point Likert scale ranging from 0 (not true of my experience) to 5 (always true of my experience).

Participants and Procedure

Undergraduate students were recruited from the University of Birmingham via the Research Participation Scheme (RPS), which is an online platform that allows students to sign up to take part in research online in order to gain course credit, and were asked to complete 7 questionnaires via Qualtrics (a secure online platform). Participants were informed that this would take approximately 20 minutes, and that upon completion of all 7 questionnaires, participants would be granted 0.5 course credits.

Before completion of the 7 questionnaires, participants were asked to provide demographic information relating to gender, age, ethnicity, education, religion and occupation. Participants were also asked if they had regularly engaged in meditation practice (i.e., at least 3 times/week) during the last two weeks. If so, participants were asked how long they had been meditating for; on average, how many times did they meditate each week; on average, and how long did they engage in meditation each time. Participants were also asked if they knew how to engage in meditation. If so, participants were asked from whom did they learn to meditate and how much did they think meditation benefited them. Table 6 provides a summary of participant demographic information and Table 7 provides a summary of participant meditation practice.

Full ethical approval for the study was granted from the University of Birmingham's Science, Technology, Engineering and Mathematics Ethical Review Committee (Appendix 3). Several ethical issues were considered and measures were put in place in relation to

Table 6 - Summary of participant demographic information

Demographic Information	N (%)
Gender	
Male	81
Female	402
Other	1
<i>Total</i>	<i>484</i>
Age Range	
18-24 year olds	479
25-34 year olds	5
<i>Total</i>	<i>484</i>
Ethnicity	
White (British)	285
White (Other)	43
Mixed/Multiple Ethnic Groups	24
Asian	96
Black/African/Caribbean	32
Other	4
<i>Total</i>	<i>484</i>
Highest Level of Education Completed	
GCSEs	1
A-Levels	443
Undergraduate degree	14
Postgraduate degree	1
Other	25
<i>Total</i>	<i>484</i>
Religious Preference	
Christian	130
Jewish	19
Muslim	28
Buddhist	5
Sikh	14
Agnostic	86
Atheist	155
Other	47
<i>Total</i>	<i>484</i>
Occupational Status	
Full-time	98
Part-time	118
Unemployed	268
<i>Total</i>	<i>484</i>

Table 7 - Summary of participant meditation practice information

Meditation Practice	N (%)
Have you regularly engaged in meditation (i.e.at least 3 times/week) during the last 2 weeks?	
Yes	40
No	444
<i>Total</i>	<i>484</i>
How long have you been meditating for?	
Less than 2 weeks	6
Between 2 weeks - 1 month	6
1-3 months	6
3-6 months	3
6-12 months	5
1-3 years	8
3-5 years	4
5+ years	2
<i>Total</i>	<i>40</i>
On average, how many times do you meditate each week?	
Less than 3 times per week	28
4-5 times per week	7
More than 5 times per week	1
Everyday	4
<i>Total</i>	<i>40</i>
On average, how long do you engage in meditation each time?	
Less than 10 minutes	19
10 – 15 minutes	12
15 - 30 minutes	6
30 – 60 minutes	3
<i>Total</i>	<i>40</i>
Do you know how to engage in meditation?	
Yes	250
No	234
<i>Total</i>	<i>484</i>
From whom did you learn to meditate?	
Parents	21
Siblings	1
Other family members	7
Online	118
Instructor	44
Friends	17
Other	46

<i>Total</i>	254
How much do you think meditation benefits you?	
Not at all	1
Slightly	4
Somewhat	16
Mostly	12
Definitely	7
<i>Total</i>	40

informed consent, confidentiality and anonymity, and storage of data. There were no anticipated risks to participants by taking part in the study as all of the measures included in the study are routine, non-clinical measures and as far as the author is aware, none are associated with adverse outcomes. Upon completion of the study, all participants were provided with links to further resources which included the NHS mindfulness webpage, BeMindful.co.uk, and the Mind mindfulness webpage.

Analysis

The development and evaluation of the CIS in this study was conducted, and is subsequently reported, in four separate parts. Part 1 reports the development of the item list for the CIS and details the exploratory factor analysis that was performed to produce the initial factor structure for the measure. Part 2 reports the confirmatory factor analysis that was conducted to validate the factor structure identified from the exploratory factor analysis. Part 3 details the normative and the reliability data for the CIS measure. Part 4 reports the convergent validity for the CIS. SPSS was the statistical package used to export the data from Qualtrics and was used for the normative and reliability data. JASP was the statistical package used to conduct the exploratory factor analysis and the confirmatory factor analysis. RStudio was the statistical package used for the convergent validity data.

Results

Part 1: Exploratory Factor Analysis

An exploratory factor analysis was performed on the 44 CIS items with the aim of identifying the 'latent' variables or underlying factor structure which best explains the variance amongst the items. Factor analysis is used extensively in the development of psychometric scales (Coolican, 2018) and is particularly relevant to construct validity as it allows researchers to discover the factorial validity of the questions that make up each scale or construct (Dancy & Reidy, 2017).

484 undergraduate students participated in the study. The data set was split by randomly selecting 75% of the sample (N=372) with which to perform an exploratory factor analysis to identify the factor structure that best fit the data.

Step 1: Initial Solution and Data Checking

An exploratory factor analysis was carried out on 75% of the data set using parallel analysis, which produced a 7 factor initial solution. The correlation matrix was inspected to ensure suitability of the data for analysis by ensuring that the majority of correlations were above 0.3. All 44 items correlated to one or more factors by 0.3 or more, except item 30, and the data was therefore deemed to be suitable for subsequent analysis (Table 8).

Step 2: Factor Rotation

An orthogonal varimax rotation was performed on the data, whereby the factors are not allowed to correlate with each other and remain unrelated. This tries to maximise high

Table 8 – Correlation matrix showing the factor loadings for the 44 items of the Cognitive Insight Scale (CIS)

CIS Item Number	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Uniqueness
CIS_1	0.665	.	.	.	.	.	.	0.513
CIS_10	.	.	0.287	0.376	.	.	0.292	0.637
CIS_11	.	.	0.277	0.312	.	.	0.519	0.517
CIS_12	.	.	.	.	.	.	0.602	0.562
CIS_13recoded	.	0.480	.	.	.	.	.	0.687
CIS_14recoded	.	.	.	.	.	0.660	.	0.486
CIS_15	0.455	.	0.417	.	.	.	.	0.535
CIS_16	0.722	.	0.287	.	.	.	.	0.360
CIS_17	.	-0.228	.	.	0.607	.	.	0.534
CIS_18	0.333	.	0.201	0.314	.	.	.	0.686
CIS_19	0.216	0.358	0.501	.	.	-0.253	.	0.488
CIS_2	0.738	.	.	.	.	.	.	0.419
CIS_20recoded	.	0.428	.	.	.	0.340	.	0.641
CIS_21	.	.	.	0.679	.	.	.	0.466
CIS_22	.	.	.	.	0.691	.	.	0.452
CIS_23	.	.	0.586	.	.	.	.	0.575
CIS_24	.	.	.	0.577	0.223	.	0.264	0.518
CIS_25recoded	.	0.649	.	.	.	.	.	0.529
CIS_26	0.543	.	0.389	0.273	.	.	.	0.429
CIS_27	.	.	.	0.263	0.511	.	.	0.551
CIS_28	0.289	.	0.410	0.311	.	.	.	0.621
CIS_29recoded	.	0.456	.	.	.	.	.	0.726
CIS_3	0.517	.	.	.	.	.	.	0.622
CIS_30	0.216	.	.	0.221	.	.	.	0.743
CIS_31recoded	.	0.318	.	.	.	0.448	.	0.686
CIS_32	0.610	.	0.399	0.202	.	.	.	0.383
CIS_33	0.410	.	0.424	0.299	.	.	.	0.536
CIS_34	.	.	.	0.763	.	.	.	0.329
CIS_35recoded	.	.	.	.	.	0.780	.	0.339
CIS_36	0.202	.	0.425	.	.	.	.	0.730
CIS_37	0.265	.	0.583	0.235	.	.	.	0.527
CIS_38	.	.	0.603	.	.	.	.	0.540
CIS_39recoded	.	0.694	.	.	.	.	.	0.476
CIS_4	0.203	.	.	.	0.568	.	.	0.570
CIS_40recoded	.	0.397	-0.269	.	.	0.489	.	0.520
CIS_41recoded	.	0.792	.	.	.	.	.	0.318
CIS_42recoded	.	0.689	.	.	.	.	.	0.486
CIS_43	0.336	.	0.327	0.462	.	.	.	0.535
CIS_44recoded	.	0.403	.	.	.	0.366	.	0.647
CIS_5	.	-0.253	.	.	0.566	.	.	0.527
CIS_6	0.420	.	0.239	0.273	.	.	.	0.661

CIS_7	0.393	.	.	.	.	.	0.238	0.714
CIS_8	0.291	.	0.517	.	.	.	0.207	0.572
CIS_9recoded	.	0.546	.	.	.	.	.	0.631

correlations and minimise low correlations, resulting in the uniqueness of each factor being maximised.

Step 3: Factor Extraction

Using the 7 factor initial solution, a number of criteria were used to determine the most economical number of factors whilst also explaining as much of the variance as possible.

All eigenvalues (the proportion of the total variance accounted for by each factor) greater than 1 were retained, as any factor with an eigenvalue greater than 1 explains more variance than a single observed variable (Coolican, 2018). Table 9 shows the eigenvalues for the 7 factors proposed in the initial solution.

Table 9 - Eigenvalues for each factor proposed in the initial solution 7 factor model

Factor	Eigenvalue
1	8.8309
2	4.3891
3	1.5639
4	1.3418
5	0.8433
6	0.5343
7	0.4774

As shown in Table 9, 4 factors had an eigenvalue of >1, which would suggest a 4 factor model over a 7 factor model. However, it has been noted in the literature that using a cut-off of 1 can result in either too many factors being retained or theoretically important

factors being removed, and therefore caution is advised when using this criterion, and other criteria are suggested to be used in conjunction with the eigenvalues (Coolican, 2018).

Another important criterion to use in factor extraction is the scree test, which plots each factor against their eigenvalue. The recommendation is to retain all the factors above the break or 'elbow' in the plot as these factors explain larger proportions of the total variance (Coolican, 2018). A parallel analysis was also performed to generate the average eigenvalue for each factor based on random generation of data, highlighting that eigenvalues greater than this should be retained. Figure 2 shows the scree plot generated from the factor analysis in this study and suggests that a 3-7 factor model.

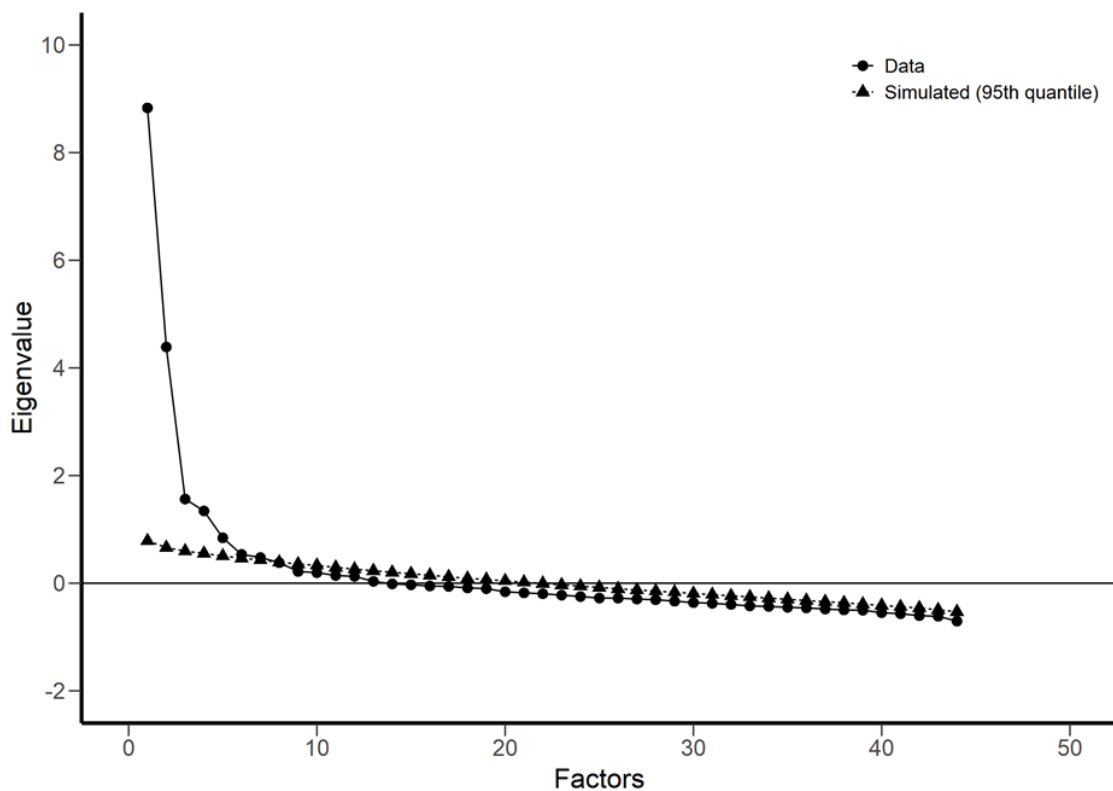


Figure 2 - Scree plot of the eigenvalues for each factor

Based on the initial solution, eigenvalues, and scree plot, additional exploratory factor analyses were performed on a 4, 5, 6 factor model, in addition to the 7 factor exploratory factor analysis, in order to ascertain which factor structure was most statistically robust and provided the best fit to the data. Table 10 reports the Root Mean Square Error of Approximation (RMSEA), Tucker-Lewis Index (TLI) and the Bayesian Information Criterion (BIC) values for a 4, 5, 6, and 7 factor model.

Table 10 - Goodness of fit measures for a 4, 5, 6, and 7 factor model

Number of Factors	RMSEA	RMSEA 90% CI		TLI	BIC
		Lower	Upper		
4	0.0593	0.0530	0.0603	0.806	-2892
5	0.0523	0.0456	0.0535	0.852	-2950
6	0.0491	0.0422	0.0504	0.870	-2874
7	0.0439	0.0364	0.0454	0.898	-2832

As can be seen from Table 10, the 7 factor model shows the lowest RMSEA value (RMSEA = 0.0439; cut-off < 0.05), the highest TLI value (TLI = 0.898; cut-off > 0.95) and the smallest BIC value (BIC = -2832) whereby there was more than a 10 point difference compared to the other BIC values when the 7 factor model was compared to a 4, 5, and 6 factor model, which constitutes ‘very strong’ evidence in favour of the 7 factor model (Hu & Bentler, 1999). A 7 factor model was therefore chosen in favour of a 4, 5, or 6 factor model, and was used to perform the confirmatory factor analysis.

Figure 3 shows the path diagram for this 7 factor model, and the factor statistics for the 7 factor model can be seen in Table 11 and Table 12.

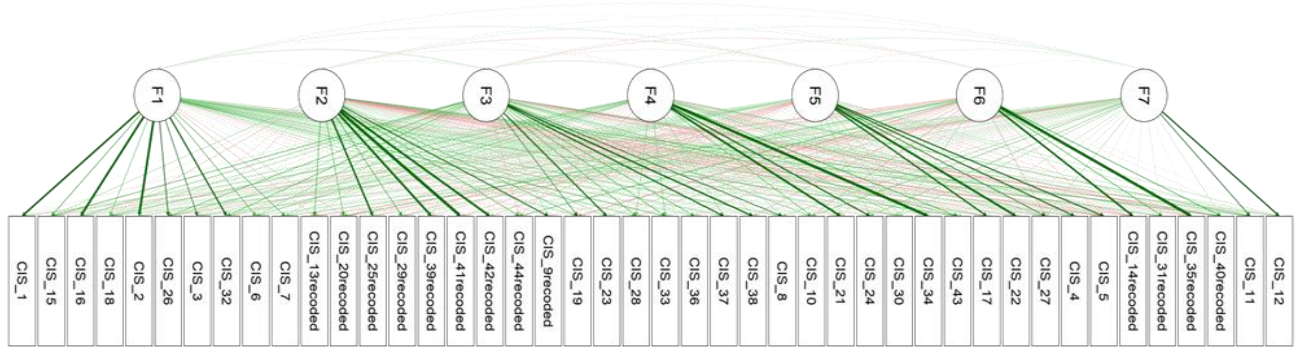


Figure 3 - Path diagram of the 7 factor model

Table 11 shows that the 7 factor model appears to explain 45.40% of the overall variance in the data. Table 12 shows that none of the factors significantly correlate with each other.

Table 11 - The sum squared loadings for each factor, the percentage of the total variance explained by each factor, and the cumulative percentage of the total variance

Factor	SS Loadings	% of Variance	Cumulative %
1	4.07	9.24	9.24
2	3.92	8.90	18.14
3	3.50	7.96	26.10
4	2.78	6.33	32.43
5	2.29	5.20	37.62
6	2.15	4.88	42.50
7	1.27	2.90	45.40

Table 12 - The factor correlation matrix

	1	2	3	4	5	6	7
1	-	0.00164	0.1275	0.0185	0.0758	0.00305	0.02732
2		-	0.0509	-0.0238	-0.0831	0.04574	0.01765
3			-	0.0996	-0.0329	-0.07486	0.05600
4				-	0.0710	-0.00922	0.07764
5					-	-0.02335	0.04162
6						-	0.00978
7							-

Table 13 shows the factor loadings of each item onto each factor from this exploratory factor analysis, whereby a factor loading cut-off of 0.5 was used. This cut-off was used as it is suggested that a variable should have a rotated factor loading of at least 0.4 (Coolican, 2018), and the cut-off of 0.5 was used as this is above the recommended factor loading of 0.4 and also minimised the number of variables loading onto more than one factor.

As can be seen from Table 13, 16 of the original 44 Items (CIS 6, 7, 10, 13, 15, 18, 20, 28, 29, 30, 31, 33, 36, 40, 43, and 44) did not load on to any of the 7 factors above the 0.5 factor loading cut-off, and therefore were removed from the factor structure (see Table 8 for the factor loadings for the removed items).

Table 13 - Factor loadings matrix for the exploratory factor analysis

CIS Item Number	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Uniqueness
CIS_1	0.665	.	.	.	.	.	.	0.513
CIS_10	0.637
CIS_11	0.519	0.517
CIS_12	0.602	0.562
CIS_13recoded	0.687
CIS_14recoded	0.660	.	0.486
CIS_15	0.535
CIS_16	0.722	.	.	.	.	.	.	0.360
CIS_17	0.607	.	.	0.534
CIS_18	0.686
CIS_19	.	.	0.501	.	.	.	.	0.488
CIS_2	0.738	.	.	.	.	.	.	0.419
CIS_20recoded	0.641
CIS_21	.	.	.	0.679	.	.	.	0.466
CIS_22	0.691	.	.	0.452
CIS_23	.	.	0.586	.	.	.	.	0.575
CIS_24	.	.	.	0.577	.	.	.	0.518
CIS_25recoded	.	0.649	.	.	.	.	.	0.529
CIS_26	0.543	.	.	.	.	.	.	0.429
CIS_27	0.511	.	.	0.551
CIS_28	0.621

CIS_29recoded	.	.	.	.	.	.	.	0.726
CIS_3	0.517	.	.	.	.	.	.	0.622
CIS_30	.	.	.	.	.	.	.	0.743
CIS_31recoded	.	.	.	.	.	.	.	0.686
CIS_32	0.610	.	.	.	.	.	.	0.383
CIS_33	.	.	.	.	.	.	.	0.536
CIS_34	.	.	.	0.763	.	.	.	0.329
CIS_35recoded	.	.	.	.	.	0.780	.	0.339
CIS_36	.	.	.	.	.	.	.	0.730
CIS_37	.	.	0.583	.	.	.	.	0.527
CIS_38	.	.	0.603	.	.	.	.	0.540
CIS_39recoded	.	0.694	.	.	.	.	.	0.476
CIS_4	.	.	.	.	0.568	.	.	0.570
CIS_40recoded	.	.	.	.	.	.	.	0.520
CIS_41recoded	.	0.792	.	.	.	.	.	0.318
CIS_42recoded	.	0.689	.	.	.	.	.	0.486
CIS_43	.	.	.	.	.	.	.	0.535
CIS_44recoded	.	.	.	.	.	.	.	0.647
CIS_5	.	.	.	.	0.566	.	.	0.527
CIS_6	.	.	.	.	.	.	.	0.661
CIS_7	.	.	.	.	.	.	.	0.714
CIS_8	.	.	0.517	.	.	.	.	0.572
CIS_9recoded	.	0.546	.	.	.	.	.	0.631

A preferred factor structure is one where each factor loads strongly on at least three items otherwise factors are considered to be unstable, and where items do not ‘cross-load’ on two or more items (Tabachnik & Fidel, 2013). From inspection of the factor loadings matrix it can be seen that two of the factors only load strongly on to two items: Factor 6 (CIS 14 and CIS 35) and Factor 7 (CIS 11 and CIS 12). As a result of this, both factors (all items) were removed from the factor structure. Further inspection of the remaining factor loadings for each item shows that each item loads significantly on to only one factor, and therefore no further items were removed due to cross-loading on two or more factors.

This resulted in a final 24 item 5 factor model derived from the initial 7 factor solution model, which has been shown to provide the best fit to the data from a statistical perspective. Table 14 summarises the final 5 factor CIS measure with regards to the

construct (3 characteristics of existence), the subscale name (and factor number), the item number (and if this item number is recoded), and the item statement. The subscale names were agreed upon through consensus discussion between the author and the supervising Psychologists (two of whom are mindfulness practitioners and researchers) by examining the construct that each item was designed to measure and each item statement.

Part 2: Confirmatory Factor Analysis

The remaining 25% (n=112) of the total number of participants (N=484) not used in the exploratory factor analysis were used to perform a confirmatory factor analysis in order to validate the factor structure identified from the exploratory factor analysis.

Table 15 shows the factor loadings of each item onto each factor from this confirmatory factor analysis, whereby a factor loading cut-off of 0.5 was used, as this is above the recommended factor loading of 0.4 (Coolican, 2018) and also minimised the number of variables loading onto more than one factor. Figure 4 shows the model plot for the 5 factor model.

A number of goodness of fit measures were calculated to determine how well the proposed 5 factor model fits the data (Table 16).

Table 14 - Summary of the 5 factor Cognitive Insight Scale (CIS)

Construct	Subscale (Factor number)	Item Number	Item Statement
Suffering	Acceptance and Embrace of Suffering (Factor 1)	CIS 1	I calmly accept physical suffering is a part of being human
		CIS 2	I fully accept that suffering is natural and normal
		CIS 3	I experience and accept that my suffering and that of my loved ones results from conditions prevailing at the time
		CIS 16	I accept with understanding the inevitability of suffering as part of being human
		CIS 26	When suffering, I observe with understanding that suffering is a part of life
		CIS 32	I accept with understanding the suffering that I experience in life
Impermanence and Non-Self Attachment	Acceptance of Impermanence and Non-Self Attachment (Factor 2)	CIS 9 (recoded)	I dislike changes that occur every day
		CIS 25 (recoded)	When facing an unsatisfactory or upsetting event, I take a long time to accept it
		CIS 39 (recoded)	I'm stressed and shaken up when having to encounter unanticipated and unwanted changes
		CIS 41 (recoded)	When things don't go as I wish, I feel highly distressed
		CIS 42 (recoded)	When an event upsets me, I wait anxiously for it to go away quickly
Impermanence	Dealing with Impermanence Peacefully (Factor 3)	CIS 8	When events I like are ending or passing, I understand and accept that as reality
		CIS 19	When I encounter unexpected changes, I stay calm and feel secure
		CIS 23	When events that I like are ending or passing, I do not try to cling on to them
		CIS 37	I am aware and accepting that nothing stays the same forever
		CIS 38	When an event that I like or feel happy about is about to pass, I accept and do not feel longing for more
Non-Self Attachment	Interconnectedness and Nature of Things (Factor 4)	CIS 21	I feel that everyone and everything is interconnected and inseparable
		CIS 24	I feel true happiness when I experience that I am harmoniously a part of all around me
		CIS 34	I am always aware that I, everyone, and everything are interconnected

Suffering	Understanding the Causes of Suffering (Factor 5)	CIS 4	I recognise that suffering occurs from the restlessness of my mind
		CIS 5	I have experienced that many times suffering occurs to me because I try to control things to remain the same
		CIS 17	I find that unhappiness and emotional distress results mainly from my own thinking and actions
		CIS 22	Suffering occurs because of my longing for this or that
		CIS 27	I regularly remind myself that the cause of suffering is clinging and excessive attachment

Table 15 - Factor loadings matrix for the confirmatory factor analysis

Factor	Indicator	Symbol	Estimate	Std. Error	z-value	p	95% Confidence Interval	
							Lower	Upper
Factor 1	CIS_1	λ_{11}	0.866	0.096	9.010	< .001	0.677	1.054
	CIS_2	λ_{12}	0.985	0.106	9.257	< .001	0.776	1.194
	CIS_3	λ_{13}	0.862	0.111	7.787	< .001	0.645	1.079
	CIS_16	λ_{14}	0.941	0.096	9.767	< .001	0.752	1.130
	CIS_26	λ_{15}	0.868	0.108	8.073	< .001	0.657	1.079
	CIS_32	λ_{16}	0.948	0.106	8.904	< .001	0.739	1.157
Factor 2	CIS_9recoded	λ_{21}	0.910	0.129	7.029	< .001	0.656	1.164
	CIS_25recoded	λ_{22}	0.775	0.114	6.823	< .001	0.552	0.998
	CIS_39recoded	λ_{23}	0.885	0.128	6.942	< .001	0.635	1.135
	CIS_41recoded	λ_{24}	0.868	0.114	7.597	< .001	0.644	1.092
	CIS_42recoded	λ_{25}	1.018	0.124	8.220	< .001	0.775	1.260
Factor 3	CIS_8	λ_{31}	0.811	0.107	7.560	< .001	0.601	1.021
	CIS_19	λ_{32}	0.675	0.117	5.755	< .001	0.445	0.905
	CIS_23	λ_{33}	0.755	0.115	6.546	< .001	0.529	0.981
	CIS_37	λ_{34}	0.592	0.119	4.987	< .001	0.359	0.824
	CIS_38	λ_{35}	0.915	0.112	8.152	< .001	0.695	1.135
Factor 4	CIS_21	λ_{41}	1.155	0.117	9.830	< .001	0.924	1.385
	CIS_24	λ_{42}	0.624	0.133	4.691	< .001	0.364	0.885
	CIS_34	λ_{43}	1.114	0.119	9.395	< .001	0.881	1.346
Factor 5	CIS_4	λ_{51}	0.982	0.115	8.562	< .001	0.757	1.206
	CIS_5	λ_{52}	0.978	0.121	8.081	< .001	0.741	1.215
	CIS_17	λ_{53}	0.796	0.132	6.049	< .001	0.538	1.054
	CIS_22	λ_{54}	0.777	0.131	5.954	< .001	0.521	1.033
	CIS_27	λ_{55}	0.761	0.117	6.515	< .001	0.532	0.990

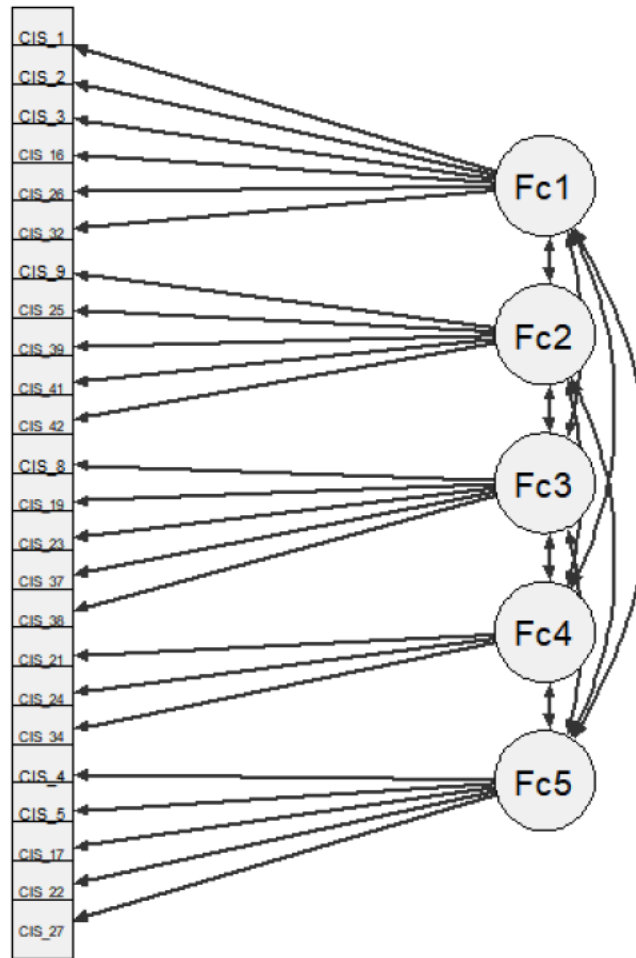


Figure 4 - Model plot for the 5 factor model

Table 16 – Goodness of fit measures for the 5 factor model (threshold values taken from Hu & Bentler, 1999)

Absolute Fit Indices		
Goodness of Fit Measure	Value	Threshold
Chi-square (χ^2/df)	$\chi^2 (242, N = 112) = 363$	< 3
Chi-square p-value	p < .001	> .05
GFI (Goodness of Fit Index)	0.807	> .95
SRMR (Standardised Root Mean Square Residual)	0.0798	< .09
RMSEA (Root Mean Square of Error Approximation)	0.0668 (90% CI; Lower Bound = 0.0521; Upper Bound = 0.0806)	< .05
RMSEA p-value	0.031	> .05
Relative Fit Indices		
Goodness of Fit Measure	Value	Threshold
CFI (Comparative Fit Index)	0.881	> .95
NFI (Bentler-Bonett Normed Fit Index)	0.719	> .95
NNFI (Bentler-Bonett Non-normed Fit Index)/ TLI (Tucker-Lewis Index)	0.865	> .95

Absolute Fit Indices

Absolute fit indices determine how well the a priori model fits, or reproduces the data (McDonald and Ho, 2002). The absolute fit indices measured in this study were the Chi-squared test, GFI, SRMR, and the RMSEA.

Chi-squared test

The chi—squared test indicates the difference between observed and expected covariance matrices. Values closer to zero indicate a better fit – a smaller difference between expected and observed covariance matrices (Hox & Bechger, 1999). As can be seen in Table 16, the chi-squared value was large $\chi^2(242, N = 112) = 363, p < .001$, suggesting the 5 factor model proposed is a poor fit to the data. One difficulty with the chi-squared test of model fit that is noted in the literature is the need for assumptions and the dependence of its power on the sample size, which may lead the test to fail to reject an inappropriate model in small sample sizes or reject an appropriate model in large sample sizes (Hox & Bechger, 1999). The chi-squared test is therefore not considered to be a reliable goodness of fit measure in factor analysis, and as a result, other measures of fit have been developed.

Goodness of fit index (GFI)

The goodness of fit index (GFI) is a measure of fit between the hypothesized model and the observed covariance matrix, and ranges between 0 and 1, with a value of over .95 generally indicating acceptable model fit (Hu & Bentler, 1999). The GFI in this study is below the .95 threshold (GFI = 0.807) indicating a poor model fit to the data.

Standardized root mean square residual (SRMR)

The standardized root mean square residual (SRMR) is the square root of the discrepancy between the sample covariance matrix and the model covariance matrix (Hooper et al. 2008), and ranges from 0 to 1, with a value of .09 or less being indicative of an acceptable model (Hu & Bentler, 1999). The SRMR is below the .09 threshold (SRMR = 0.0798) indicating a good model fit to the data.

Root mean square error of approximation (RMSEA)

The root mean square error of approximation (RMSEA) avoids issues of sample size by analysing the discrepancy between the hypothesized model, with optimally chosen parameter estimates, and the population covariance matrix (Hooper et al. 2008). The RMSEA ranges from 0 to 1, with smaller values indicating better model fit. A value of .05 or less is considered to show a good model fit (Hu & Bentler, 1999). The RMSEA in this study is slightly higher than the recommended .05 or less threshold (RMSEA = 0.0668) indicating a 'moderate' fit.

Relative fit indices

Relative fit indices compare the chi-square for the hypothesized model to one from a "null", or "baseline" model (McDonald & Ho, 2002). The relative fit indices measured in this study were the CFI, NFI, and the NNFI/TFI.

Comparative fit index (CFI)

The comparative fit index (CFI) analyses the model fit by examining the discrepancy between the data and the hypothesized model, while adjusting for the issues of sample size

inherent in the chi-squared test of model fit (Gatignon, 2010) and the normed fit index (Bentler, 1990). CFI values range from 0 to 1, with larger values indicating better fit. A CFI value of .95 or higher is accepted as an indicator of good fit (Hu & Bentler, 1999). The CFI in this study is below the recommended .95 or higher threshold (CFI = 0.881) indicating a poor model fit to the data.

Normed fit index (NFI) and non-normed fit index (NNFI)/Tucker-Lewis index (TLI)

The normed fit index (NFI) analyses the discrepancy between the chi-squared value of the hypothesized model and the chi-squared value of the null model (Bentler & Bonett, 1980). However, the NFI tends to be negatively biased (Bentler, 1990) The non-normed fit index (NNFI; also known as the Tucker-Lewis Index, TLI) resolves some of the issues of negative bias, though NNFI values may sometimes fall beyond the 0 to 1 range (Bentler, 1990). Values for both the NFI and NNFI should range between 0 and 1, with a cut-off of .95 or greater indicating a good model fit (Hu & Bentler, 1999). The NFI and the NNFI/TLI are both below the recommended .95 or higher threshold (NFI = 0.719; NNFI/TLI = 0.865) indicating a poor model fit to the data.

Part 3: Reliability and Normative Data

Reliability

Cronbach's alpha was calculated to determine the internal consistency of the scales in this study. Table 17 show a summary of the Cronbach's alpha scores for the CIS total and each of the five CIS subscales.

Table 17 - Cronbach's alpha for the CIS total and subscale scores

	Cronbach's Alpha
CIS Total	$\alpha = 0.813$
Acceptance and Embrace of Suffering Subscale	$\alpha = 0.860$
Acceptance of Impermanence and Non-Self Attachment Subscale	$\alpha = 0.814$
Dealing with Impermanence Peacefully Subscale	$\alpha = 0.776$
Interconnectedness and Nature of Things Subscale	$\alpha = 0.770$
Understanding the Causes of Suffering Subscale	$\alpha = 0.791$

As all Cronbach's alpha scores were higher than 0.7 (Field, 2017), both the total scale and each of the five CIS subscales were shown to be reliable scales in this study.

Normative Data

Independent t-tests were conducted to explore whether there were statistically significant differences on the mean CIS total and five subscales according to demographic variables. There was a significant difference observed in relation to gender, age and meditation practice in respondents who reported to have meditated at least 3 times a week during the last two weeks. There were no significant differences found in relation to ethnicity, education, religion or occupation. Due to significant differences in CIS mean scores for gender, age, and meditation, the normative performance for each variable is reported separately to reflect this.

Gender

As can be seen from Table 18, the CIS total score ($t(481) = 5.787, p < .001$) and three of the five subscales (Acceptance and Embracement of Suffering $t(481) = 5.006, p < .001$; Acceptance of Impermanence and Non-Self Attachment $t(481) = 4.813, p < .001$; Dealing with Impermanence Peacefully $t(481) = 5.306, p < .001$) evidence significantly different mean values for male and female respondents.

Table 19 provides normative data for the CIS score split across gender. It also indicates that male respondents' mean CIS total score (64.95) and all five subscale mean scores (Acceptance and Embracement of Suffering = 18.49; Acceptance of Impermanence and Non-Self Attachment = 15.22; Dealing with Impermanence Peacefully = 14.07; Interconnectedness and Nature of Things = 6.75; Understanding the Causes of Suffering = 10.41) were higher than those of female respondents (CIS Total Score = 55.64; Acceptance and Embracement of Suffering = 15.14; Acceptance of Impermanence and Non-Self Attachment = 12.28; Dealing with Impermanence Peacefully = 11.21; Interconnectedness and Nature of Things = 6.71; Understanding the Causes of Suffering = 10.29).

Age

As can be seen from Table 20, the CIS total score ($t(482) = 2.791, p = .005$) and one of the five subscales (Interconnectedness and Nature of Things $t(482) = 2.162, p = .031$) evidence statistically significant different mean values for 18-24 year old respondents and 25-34 year old respondents. However, the sample size for the older respondents was very small, and should be interpreted with caution ($n=5$).

Table 18 - Independent t-tests by gender

		Levene's Test for Equality of Variances		t	df	Sig. (2-tailed)
		F	Sig.			
CIS Total Score	Equal variances assumed	.999	.318	5.787	481	.000*
	Equal variances not assumed			5.550	110.268	.000
Acceptance and Embracement of Suffering Subscale	Equal variances assumed	1.101	.295	5.006	481	.000*
	Equal variances not assumed			4.702	108.326	.000
Acceptance of Impermanence and Non-Self Attachment Subscale	Equal variances assumed	2.643	.105	4.813	481	.000*
	Equal variances not assumed			4.507	108.059	.000
Dealing with Impermanence Peacefully Subscale	Equal variances assumed	2.030	.155	5.306	481	.000*
	Equal variances not assumed			4.949	107.706	.000
Interconnectedness and Nature of Things Subscale	Equal variances assumed	.326	.568	.112	481	.911
	Equal variances not assumed			.110	112.569	.913
Understanding the Causes of Suffering Subscale	Equal variances assumed	.246	.620	.186	481	.853
	Equal variances not assumed			.191	118.120	.849

* $p < .01$.

Table 19 - Normative performance for male and female respondents

		Mean	Standard Deviation	Valid N	Percentile 05	Percentile 25	Median	Percentile 75	Percentile 95
CIS Total Score	Male	64.95	13.91	81	45.00	56.00	65.00	75.00	86.00
	Female	55.64	13.07	402	35.00	47.00	56.00	65.00	78.00
Acceptance and Embrace of Suffering Subscale	Male	18.49	5.94	81	9.00	14.00	19.00	23.00	28.00
	Female	15.14	5.40	402	7.00	12.00	15.00	19.00	24.00
Acceptance of Impermanence and Non-Self Attachment Subscale	Male	15.22	5.44	81	7.00	11.00	16.00	20.00	23.00
	Female	12.28	4.92	402	4.00	9.00	13.00	16.00	20.00
Dealing with Impermanence Peacefully Subscale	Male	14.07	4.83	81	7.00	11.00	14.00	18.00	22.00
	Female	11.21	4.35	402	4.00	8.00	11.00	14.00	19.00
Interconnectedness and Nature of Things Subscale	Male	6.75	3.50	81	2.00	4.00	6.00	9.00	13.00
	Female	6.71	3.41	402	1.00	4.00	7.00	9.00	12.00
Understanding the Causes of Suffering Subscale	Male	10.41	4.84	81	3.00	7.00	11.00	13.00	17.00
	Female	10.29	5.07	402	2.00	6.00	10.00	14.00	19.00

Table 20 - Independent t-tests by age

		Levene's Test for Equality of Variances		t	df	Sig. (2-tailed)
		F	Sig.			
CIS Total Score	Equal variances assumed	.039	.843	-2.791	482	.005**
	Equal variances not assumed			-3.011	4.098	.038
Acceptance and Embrace of Suffering Subscale	Equal variances assumed	.009	.926	-1.882	482	.060
	Equal variances not assumed			-1.799	4.077	.145
Acceptance of Impermanence and Non-Self Attachment Subscale	Equal variances assumed	1.901	.169	-.094	482	.925
	Equal variances not assumed			-.059	4.032	.956
Dealing with Impermanence Peacefully Subscale	Equal variances assumed	4.278	.039	-2.842	482	.005
	Equal variances not assumed			-1.798	4.033	.146
Interconnectedness and Nature of Things Subscale	Equal variances assumed	.194	.659	-2.162	482	.031*
	Equal variances not assumed			-2.044	4.075	.109
Understanding the Causes of Suffering Subscale	Equal variances assumed	.375	.541	-1.296	482	.196
	Equal variances not assumed			-1.368	4.094	.241

* $p < .05$. ** $p < .01$

Table 21 shows that 25-34 year old respondents' mean CIS total score (74) and all five subscale mean scores (Acceptance and Embracement of Suffering = 20.40; Acceptance of Impermanence and Non-Self Attachment = 13.00; Dealing with Impermanence Peacefully = 17.40; Interconnectedness and Nature of Things = 10.00; Understanding the Causes of Suffering = 13.20) were higher than those of 18-24 year old respondents (CIS total score = 57; Acceptance and Embracement of Suffering = 15.63; Acceptance of Impermanence and Non-Self Attachment = 12.78; Dealing with Impermanence Peacefully = 11.63; Interconnectedness and Nature of Things = 6.69; Understanding the Causes of Suffering = 10.27).

Meditation

As can be seen from Table 22, the CIS total score ($t(482) = 3.827, p < .001$) and two of the five subscales, namely Interconnectedness and Nature of Things ($t(482) = 2.135, p = .033$) and Understanding the Causes of Suffering ($t(482) = 4.481, p < .001$) evidence statistically significant different mean values for respondents that meditated at least 3 times a week during the last two weeks and respondents that did not meditate at least 3 times a week during the last two weeks.

Table 21 - Normative performance for 18-24 year old respondents and 25-34 year old respondents

		Mean	Standard Deviation	Valid N	Percentile 05	Percentile 25	Median	Percentile 75	Percentile 95
CIS Total Score	18-24 years old	57.00	13.56	479	36.00	48.00	57.00	66.00	80.00
	25-34 years old	74.00	12.55	5	60.00	68.00	69.00	81.00	92.00
Acceptance and Embrace of Suffering Subscale	18-24 years old	15.63	5.64	479	6.00	12.00	16.00	19.00	25.00
	25-34 years old	20.40	5.90	5	16.00	16.00	18.00	22.00	30.00
Acceptance of Impermanence and Non-Self Attachment Subscale	18-24 years old	12.78	5.10	479	4.00	9.00	13.00	17.00	21.00
	25-34 years old	13.00	8.19	5	2.00	10.00	12.00	17.00	24.00
Dealing with Impermanence Peacefully Subscale	18-24 years old	11.63	4.49	479	4.00	9.00	11.00	15.00	19.00
	25-34 years old	17.40	7.16	5	10.00	12.00	15.00	25.00	25.00
Interconnectedness and Nature of Things Subscale	18-24 years old	6.69	3.41	479	1.00	4.00	7.00	9.00	12.00
	25-34 years old	10.00	3.61	5	5.00	9.00	10.00	11.00	15.00
Understanding the Causes of Suffering Subscale	18-24 years old	10.27	5.04	479	2.00	6.00	10.00	14.00	19.00
	25-34 years old	13.20	4.76	5	7.00	11.00	14.00	14.00	20.00

Table 22 - Independent t-test by meditation

		Levene's Test for Equality of Variances		t	df	Sig. (2-tailed)
		F	Sig.			
CIS Total Score	Equal variances assumed	.478	.490	3.827	482	.000**
	Equal variances not assumed			3.314	44.120	.002
Acceptance and Embracement of Suffering Subscale	Equal variances assumed	4.854	.028	1.986	482	.048
	Equal variances not assumed			1.622	43.424	.112
Acceptance of Impermanence and Non-Self Attachment Subscale	Equal variances assumed	.182	.670	.824	482	.410
	Equal variances not assumed			.834	46.539	.408
Dealing with Impermanence Peacefully Subscale	Equal variances assumed	1.494	.222	1.468	482	.143
	Equal variances not assumed			1.229	43.707	.226
Interconnectedness and Nature of Things Subscale	Equal variances assumed	.003	.956	2.135	482	.033*
	Equal variances not assumed			2.151	46.440	.037
Understanding the Causes of Suffering Subscale	Equal variances assumed	.051	.822	4.481	482	.000**
	Equal variances not assumed			4.617	46.876	.000

* $p < .05$ ** $p < .01$

Table 23 shows that the mean CIS total score (64.97) and all five subscale mean scores (Acceptance and Embracement of Suffering = 17.38; Acceptance of Impermanence and Non-Self Attachment = 13.42; Dealing with Impermanence Peacefully = 12.70; Interconnectedness and Nature of Things = 7.83; Understanding the Causes of Suffering = 13.65) for respondents who reported that they meditated at least 3 times a week during the last two weeks (meditators) were higher than for respondents who reported that they did not meditate at least 3 times a week during the last two weeks (non-meditators) (CIS total score = 56.47; Acceptance and Embracement of Suffering = 15.53; Acceptance of Impermanence and Non-Self Attachment = 12.73; Dealing with Impermanence Peacefully = 11.60; Interconnectedness and Nature of Things = 6.62; Understanding the Causes of Suffering = 10.00).

Part 4: Convergent Validity

A Pearson's r correlation matrix was calculated in order to assess the convergent validity of the CIS total score and subscale scores with established measures of mindfulness and well-being which have been demonstrated to have good reliability and validity.

Measures

The Freiburg Mindfulness Inventory

The Freiburg Mindfulness Inventory (FMI; Walach et al., 2006) is a 14-item self-report scale comprised of four constructs within the one overall scale: present-moment dis-identifying attention, non-judgemental towards self and others, openness to negative mind states, and process-oriented or insight understanding. Each item is rated on a four-point

Table 23 - Normative performance for respondents who meditated regularly during the last two weeks and respondents who did not meditate regularly during the last two weeks

		Mean	Standard Deviation	Valid N	Percentile 05	Percentile 25	Median	Percentile 75	Percentile 95
CIS Total Score	Meditators	64.97	15.73	40	37.00	56.50	65.00	74.50	89.00
	Non-meditators	56.47	13.24	444	36.00	47.50	56.50	66.00	79.00
Acceptance and Embrace of Suffering Subscale	Meditators	17.38	7.02	40	6.00	12.50	17.50	23.00	28.50
	Non-meditators	15.53	5.50	444	7.00	12.00	15.50	19.00	24.00
Acceptance of Impermanence and Non-Self Attachment Subscale	Meditators	13.42	5.06	40	5.00	10.00	13.00	17.50	21.00
	Non-meditators	12.73	5.13	444	4.00	9.00	13.00	17.00	21.00
Dealing with Impermanence Peacefully Subscale	Meditators	12.70	5.51	40	3.00	10.00	12.00	15.50	23.50
	Non-meditators	11.60	4.45	444	5.00	8.50	11.00	15.00	19.00
Interconnectedness and Nature of Things Subscale	Meditators	7.83	3.38	40	1.50	6.00	7.50	10.00	12.50
	Non-meditators	6.62	3.41	444	1.00	4.00	6.00	9.00	12.00
Understanding the Causes of Suffering Subscale	Meditators	13.65	4.78	40	4.50	11.00	15.00	17.00	19.50
	Equal variances not assumed	10.00	4.95	444	2.00	6.00	10.00	13.00	19.00

Likert scale ranging from 1 (rarely) to 4 (almost always), and a higher total score reflects higher mindfulness. Good overall internal consistency was found for the FMI in this current study ($\alpha = .823$).

Five Facet Mindfulness Questionnaire

The Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) is a 39-item self-report scale relating to aspects of mindfulness which are rated on a 5-point Likert scale ranging from 1 (never or very rarely true) to 5 (very often or always true). This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness: observing, describing, acting with awareness, non-judging or inner experience and non-reactivity to inner experience. Higher total and subscale scores reflect higher mindfulness. Good internal consistency was found for the FFMQ total score ($\alpha = .850$) and all five subscales (Observing $\alpha = .803$; Describing $\alpha = .885$; Acting with Awareness $\alpha = .864$; Non-judging $\alpha = .901$; Non-reactivity $\alpha = .771$) in this study.

Positive and Negative Affect Scale

The Positive and Negative Affect Scale (PANAS; Watson et al., 1988) is a brief measure of affective states. It contains 20 adjectives which describe positive and negative emotions. Participants respond to these items on a 5-point Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely). Overall scores for positive- and negative-emotion adjectives are calculated separately, with higher scores reflecting higher levels of positive and negative emotion respectively. In this study, both subscales were found to have good

internal consistency (positive emotion subscale $\alpha = .861$; negative emotion subscale $\alpha = .845$).

Emotion Regulation Questionnaire

The Emotion Regulation Questionnaire (ERQ; Gross and John, 2003) is a 10-item scale designed to measure respondents' tendency to regulate their emotions in two ways: cognitive reappraisal and expressive suppression. Respondents answer each item on a 7-point Likert scale ranging from 1 (strong disagree) to 7 (strongly disagree). Overall scores for cognitive reappraisal and expressive suppression are calculated separately. Higher scores on the cognitive reappraisal subscale reflect higher positive emotion, lower negative emotion, better interpersonal functioning and positive wellbeing. Higher scores on the expressive suppression scale reflect lower positive emotions, higher negative emotion, worse interpersonal functioning, and negative wellbeing. In this study, both subscales were found to have good internal consistency (Cognitive reappraisal subscale $\alpha = .851$; Expressive suppression subscale $\alpha = .764$).

Questionnaire for Eudaimonic Well-Being

The Questionnaire for Eudaimonic Well-Being (QEWB; Waterman et al., 2010) is a 21-item self-report scale assessing wellbeing across six domains: self-discovery, perceived development of one's best potential, a sense of purpose and meaning in life, investment of significant effort in pursuit of excellence, intense involvement in activities, and enjoyment of activities as personally expressive. Each item is rated on a five-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree), where higher total scores reflect higher

wellbeing. Good internal consistency was found for the QEWB in this current study ($\alpha = .802$).

Acceptance and Action Questionnaire

The Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011) is a 7-item self-report questionnaire which is designed to measure psychological inflexibility. Each item is rated on a seven-point Likert scale ranging from 1 (not at all true) to 7 (completely true). Higher total scores reflect greater levels of psychological inflexibility. Good internal consistency was found for the AAQ-II in this current study ($\alpha = .882$).

Heat Maps

A Pearson's r correlation matrix was calculated in order to assess the convergent validity of the CIS total scores and subscale scores with the aforementioned established measures of mindfulness and wellbeing. This correlation matrix is presented in the form of a heat map for the FMI and the FFMQ in Figure 5 and for the QEWB, AAQ-II, PANAS, and ERQ in Figure 6. In order to aid visualisation of the correlation matrix, the variables on each axis were ordered on the basis of a hierarchical cluster. Correlations greater than 0.2 or less than -0.2 are shown in red and blue respectively, and increase in colour intensity proportional to the size of the correlation.

FFMI and FFMQ

As can be seen in Figure 5, there were positive correlations between the CIS total score and four of the five CIS subscales and the FMI (CIS Total Score $r = 0.543$; Dealing with Impermanence Peacefully $r = 0.588$; Acceptance and Embracement of Suffering $r = 0.363$;

Acceptance of Impermanence and Non-Self Attachment $r = 0.307$; Interconnectedness and Nature of Things $r = 0.283$).

There were positive correlations between the CIS total score and two of the five CIS subscales and the FFMQ total score (CIS Total Score $r = 0.336$; Acceptance of Impermanence and Non-Self Attachment $r = 0.364$; Dealing with Impermanence Peacefully $r = 0.360$). There

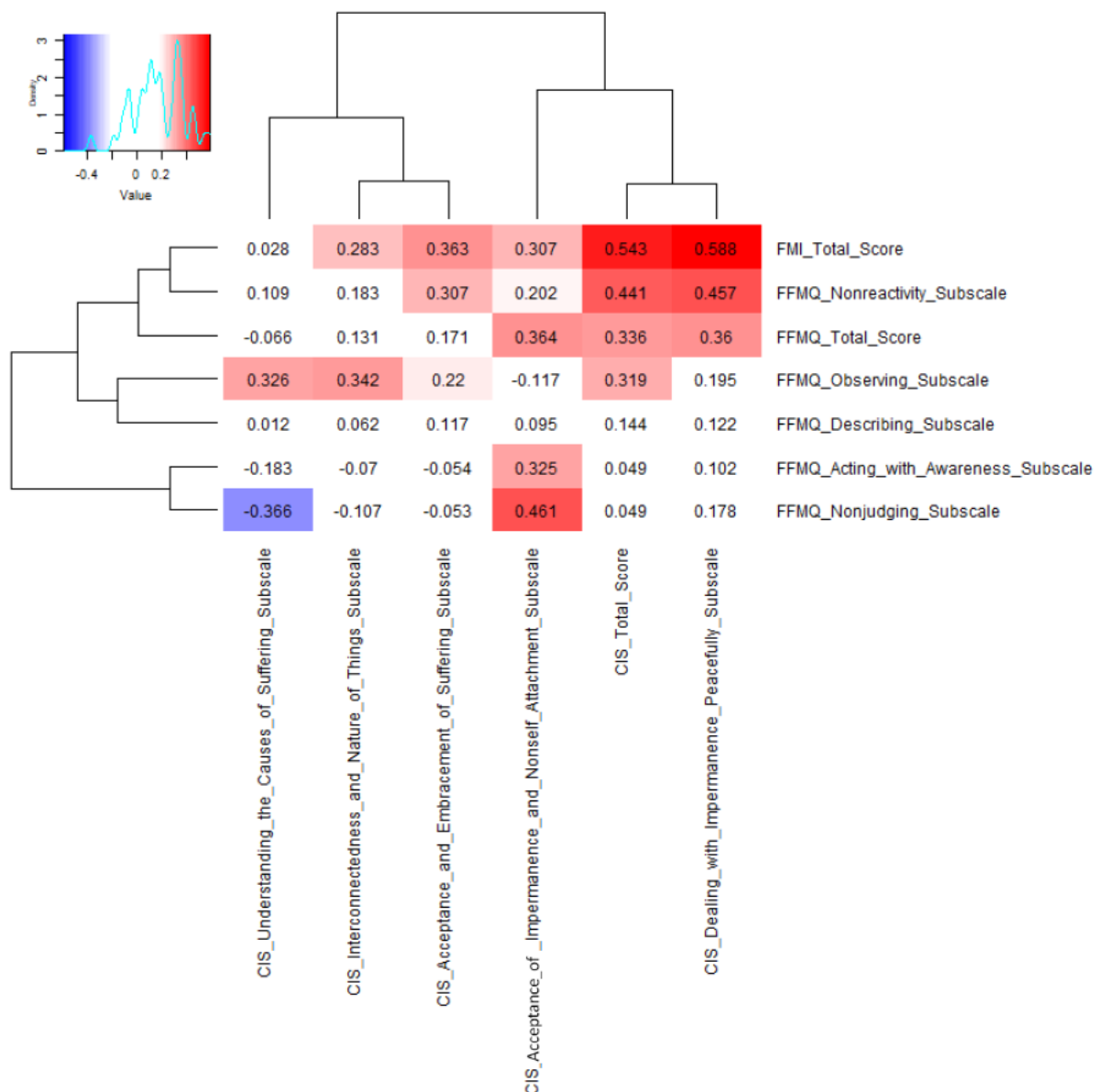


Figure 5 - Heat plot of the correlations between the Cognitive Insight Scale (CIS) total score and subscale scores (x-axis) and the Freiburg Mindfulness Inventory (FMI) and the Five Facet Mindfulness Questionnaire (FFMQ) total score and subscale scores (y-axis)

were positive correlations between the CIS total score and three of the five CIS subscales and the FFMQ Non-reactivity subscale (CIS Total Score $r = 0.441$; Dealing with Impermanence Peacefully $r = 0.457$; Acceptance and Embracement of Suffering $r = 0.307$; Acceptance of Impermanence and Non-Self Attachment $r = 0.202$). There were positive correlations between the CIS total score and three of the five CIS subscales and the FFMQ Observing subscale (CIS Total Score $r = 0.319$; Interconnectedness and Nature of Things $r = 0.342$; Understanding the Causes of Suffering $r = 0.326$; Acceptance and Embracement of Suffering $r = 0.22$). There were positive correlations between the CIS Acceptance of Impermanence and Non-Self Attachment subscale and two of the five FFMQ subscales (Non-judging $r = 0.461$; Acting with Awareness $r = 0.325$). There was a negative correlation between the CIS Understanding the Causes of Suffering subscale and the FFMQ Non-judging subscale ($r = -0.366$). There were no significant correlations between the CIS total or any of the five CIS subscales and the FFMQ Describing subscale.

For the CIS measure, a hierarchical cluster analysis revealed two separate clusters: the first cluster showed that the Understanding the Causes of Suffering subscale, Interconnectedness and Nature of Things subscale, and Acceptance and Embracement of Suffering subscale were similar; and the second cluster showed that the CIS Total Score, Acceptance of Impermanence and Non-Self Attachment subscale, and Dealing with Impermanence subscale were similar. For the FMI and the FFMQ, the hierarchical cluster analysis revealed 3 separate clusters: the first cluster showed that the FMI Total Score, FFMQ Non-reactivity subscale, and FFMQ Total Score were similar; the second cluster showed that the FFMQ Observing subscale and the FFMQ Describing subscale were similar;

and the third cluster showed that the FFMQ Acting with Awareness subscale and FFMQ Non-judging subscale were similar.

PANAS, ERQ, QEWB and AAQ-II

As can be seen in Figure 6, there were positive correlations between the CIS total score and two of the five CIS subscales and the PANAS Positive Emotion subscale (CIS Total Score $r = 0.284$; Dealing with Impermanence Peacefully $r = 0.293$; Acceptance and Embracement of Suffering $r = 0.205$). There was a positive correlation between the CIS Understanding the Causes of Suffering subscale and the PANAS Negative Emotions subscale ($r = 0.324$). There were negative correlations between two of the five CIS subscales and the PANAS Negative Emotions subscale (Acceptance of Impermanence and Non-Self Attachment $r = -0.443$; Dealing with Impermanence Peacefully $r = -0.222$)

There were positive correlations between the CIS total score and one of the five CIS subscales and the ERQ Cognitive Reappraisal subscale (CIS Total Score $r = 0.261$; Dealing with Impermanence Peacefully $r = 0.316$). There were no significant correlations between the CIS total score or any of the five CIS subscales and the ERQ Expressive Suppression subscale.

There were positive correlations between the CIS total score and two of the five CIS subscales and the QEWB (CIS Total Score $r = 0.36$; Dealing with Impermanence Peacefully $r = 0.309$; Acceptance and Embracement of Suffering $r = 0.259$).

There were negative correlations between two of the five CIS subscales and the AAQ-II (Acceptance of Impermanence and Non-Self Attachment $r = -0.511$; Dealing with

Impermanence Peacefully $r = -0.244$). There was a positive correlation between the CIS Understanding the Causes of Suffering subscale and the AAQ-II ($r = 0.364$).

For the CIS measure, a hierarchical cluster analysis revealed one cluster of similar items (Dealing with Impermanence Peacefully subscale, CIS Total Score, Acceptance and

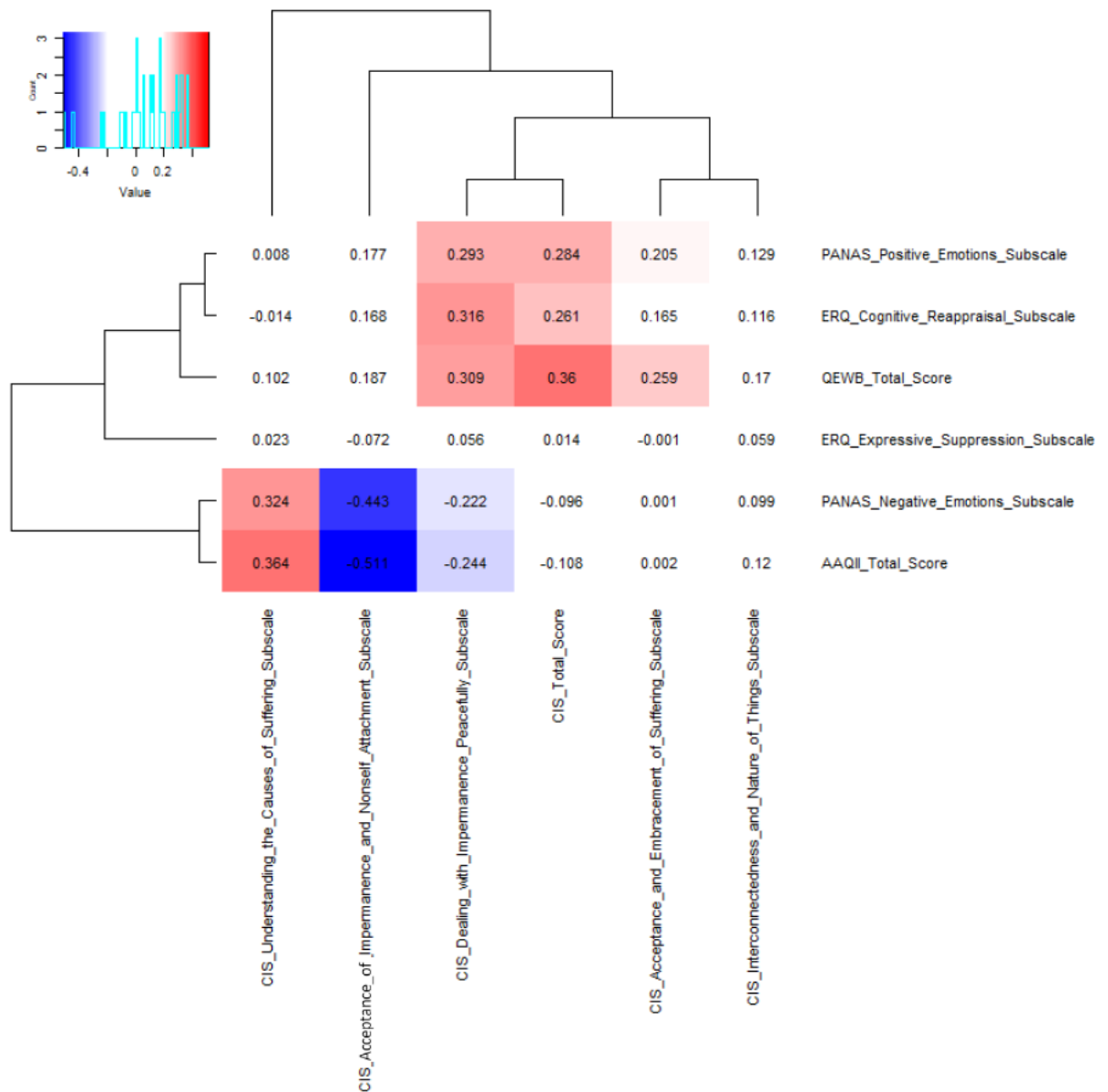


Figure 6 - Heat plot of the correlations between the Cognitive Insight Scale (CIS) total score and subscale scores (x-axis) and the Questionnaire for Eudaimonic Well-Being (QEWB) and Acceptance and Action Questionnaire-II (AAQ-II) total scores and the Positive and Negative Affect Scale (PANAS) and Emotion Regulation Questionnaire (ERQ) subscale scores (y-axis).

Embracement of Suffering subscale, and Interconnectedness and Nature of Things subscale). The Understanding the Causes of Suffering subscale and the Acceptance of Impermanence and Non-self Attachment subscale were not clustered with any of the other CIS subscales or the CIS Total Score. For the PANAS subscales, the ERQ subscales, the QEWB, and the AAQ-II, the hierarchical cluster analysis revealed 2 separate clusters: the first cluster showed that the PANAS Positive Emotion subscale, the ERQ Cognitive Reappraisal subscale, the QEWB, and the ERQ Expressive Suppression subscale were similar; the second cluster showed that the PANAS Negative Emotion subscale and AAQ-II Total Score were similar.

Discussion

An exploratory factor analysis was performed on the original 44-itemed CIS measure which yielded a final 24-item, 5 factor model, derived from an initial 7 factor solution model, which was shown to provide the best fit to the data from a statistical perspective. The resultant 5 factor CIS measure consisted of two subscales which measured the construct 'suffering' ('Acceptance and Embracement of Suffering' and 'Understanding the Causes of Suffering'), one subscale which measured 'impermanence' ('Dealing with Impermanence Peacefully'), one subscale which measured 'non-self attachment' ('Interconnectedness and Nature of Things'), and one subscale which measured both 'impermanence' and 'non-self-attachment' ('Acceptance of Impermanence and Non-Self Attachment'). Of note, the subscale which measured both 'impermanence' and 'non-self-attachment' ('Acceptance of Impermanence and Non-Self Attachment') consisted entirely of negative worded (recoded) items.

The CIS total and each of the 5 CIS subscales were shown to have good internal consistency (α range 0.770 – 0.860).

When a confirmatory factor analysis was carried out, whilst the chi-squared test, GFI, CFI, NFI, and NNFI/TLI values did not meet the stated thresholds and therefore suggest that the proposed 5 factor model is a poor fit to the data, the SRMR value suggested a good model fit to the data, and the RMSEA value suggested a moderate model fit to the data. Hu & Bentler (1999) do not recommend using one single index but to use one of the relative fit indices (such as the CFI, NFI or the NNFI/TLI) in combination with one of the absolute fit indices (such as the GFI, RMSEA, or SRMR). In view of the fact that two of the relative fit indices approached the threshold of $>.95$ (CFI = 0.881; NNFI/TLI = 0.865), and one of the

absolute fit indices was below the threshold of $< .09$ (SRMR = 0.0798), the 5 factor model was deemed to be a 'moderate' fit to the data and on balance, along with the strong theoretical background, meant that this factor structure was accepted as the best fit to the data.

Independent t-tests found statistically significant differences on the mean CIS total and five subscales in relation to gender, age and meditation practice in respondents who reported to have meditated at least 3 times a week during the last two weeks. There were no significant differences found in relation to ethnicity, education, religion or occupation.

Gender differences

Male respondents' scored higher on the CIS total mean score and all five subscale mean scores, with the CIS total score and three of the five CIS subscales (Acceptance and Embracement of Suffering, Acceptance of Impermanence and Non-Self Attachment, and Dealing with Impermanence Peacefully) being statistically significantly higher than female respondents. This finding would appear to contrast with prior research that has found gender differences in mindfulness. Lilja et al. (2011) found that in a study designed to assess the Swedish version of the FFMQ, women rated themselves as higher than men in the Observing and Describing subscales, although the authors conclude that this might be due to age differences, which was indicated by a linear regression analysis. However Hansen et al. (2009) did also find that women scored significantly higher than men on the Observing scale using the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004). The finding that males scored statistically significantly higher than females on the CIS total score and three of the five CIS subscales in this study would therefore need further exploration. It is possible that the unique aspects of mindfulness tapped into by this scale (insight) are for

some reason endorsed more highly by males than females, however the reasons for this are unclear and require future replication.

Age

Older respondents' (25-34 year olds) scored higher on the CIS total mean score and all five subscale mean scores, with the CIS total score and one of the five subscales (Interconnectedness and Nature of Things) being statistically significantly higher than younger respondents (18-24 year olds). Whilst the sample size for the 'older' respondents was very small (n=5), and therefore these results should be interpreted with caution, there is research in support of this finding. Lilja et al. (2011) found that significant age differences were found in a Swedish sample on the Non-reactivity, Observing and Describing FFMQ subscales, as well as on the global FFMQ scale, whereby older participants obtained higher values than younger participants (21 years and 21-24 years); and that a regression analysis found that age was the best predictor of levels of mindfulness (Lilja et al., 2011).

Meditation practice

Respondents who reported to meditate regularly (at least 3 times a week during the last two weeks) scored higher on the CIS total mean score and all five subscale mean scores, with the CIS total score and two of the five CIS subscales (Interconnectedness and Nature of Things and Understanding the Causes of Suffering) being statistically significantly higher than respondents who reported that they did not meditate regularly (at least 3 times a week during the last two weeks). This finding is consistent with the literature that has shown that meditation experience is associated with levels of mindfulness (Baer, 2009; Brown & Ryan, 2003).

Convergent validity

A Pearson's r correlation matrix was calculated in order to assess the convergent validity of the CIS total score and subscale scores with 6 established measures of mindfulness and well-being (FMI, FFMQ, QEWB, AAQ-II, PANAS, and ERQ), all of which have been demonstrated to have good reliability and validity and showed good internal consistency in this study (α range 0.764 - 0.901).

With regards to mindfulness measures, the CIS appeared to positively correlate more strongly with the FMI as opposed to the FFMQ. This is an interesting finding as the FMI items were developed based on Buddhist teachings and so theoretically should show stronger correlations with the items on the CIS than the FFMQ, as was observed. Whilst the FFMQ was developed from a factor analytic study of 5 independently developed mindfulness questionnaires (which included the FMI) the face validity of these questionnaires has been brought into question as they are thought to more likely represent Westernised ideas of mindfulness, as opposed to the original notion of mindfulness that is embedded in Buddhist traditions (Rosch, 2007).

With regards to wellbeing measures, the CIS correlated in the expected direction in that the CIS total score and two of the five CIS subscales (Dealing with Impermanence Peacefully and Acceptance and Embracement of Suffering) positively correlated with positive emotions on the PANAS, cognitive reappraisal on the ERQ, and higher levels of eudaimonic wellbeing on the QEWB. Similarly, negative correlations were found between two of the five CIS subscales (Acceptance of Impermanence and Non-Self Attachment *and* Dealing with Impermanence Peacefully) and the PANAS negative emotion subscale and the AAQ-II.

In contrast, there were found to be positive correlations between the CIS Understanding the Causes of Suffering subscale and the PANAS negative emotions subscale and the AAQ-II, with higher total scores on the AAQ-II reflecting greater levels of psychological inflexibility. Similarly, there was found to be a negative correlation between the CIS Understanding the Causes of Suffering subscale and the FFMQ Non-judging subscale ($r = -0.366$).

A possible interpretation of these findings is that it is documented that there can be adverse effects to developing insight into the three characteristics of existence, particularly in the early stages of insight (Grabovac, 2015), with Buddhist teachings specifically cautioning against the incorrect teaching and practice of meditation and/or mindfulness (Shonin et al., 2014). Van Gordon et al. (2015) warn that research specifically investigating whether there are health risks associated with participation in MBIs is significantly underdeveloped, and reported adverse effects to various meditation approaches have included psychotic episodes, painful kinesthetic sensations, addiction to meditation, anti-social behaviour, impaired reality testing, dissociation, despair, and exhaustion (Shonin et al., 2014). In view of this, it is important to acknowledge that whilst there is a lot of evidence to support the benefits of mindfulness, developing mindfulness skills and insight has the potential to lead to unwanted outcomes, which could include negative emotions and/or psychological inflexibility as implied from the findings in this study.

Limitations

There are a number of limitations to this study that should be borne in mind when interpreting the findings. One such limitation is that the 5 factor CIS measure reported here, at best, could be said to provide a 'moderate' fit to the data. Whilst previous research

would appear to support SG-MBIs in both Eastern and Western cultures, the lack of familiarity with the three characteristics of existence may call into question the utility of the current version of the CIS in both meditators and non-meditators who are likely to be more familiar with the notion of mindfulness as taught in FG-MBIs.

In line with the above, Van Dam et al. (2009) found that meditators and non-meditators in the US with similar overall levels of mindfulness differentially endorsed response options for positively and negatively worded items on the FFMQ, and concluded that there may be a potential problem regarding construct validity when comparing meditators to non-meditators in assessing mindfulness.

A further limitation is that the sample in this study consisted of UK undergraduate students who were predominantly female non-meditators between 18-24 years of age, which therefore limits the generalisability of the findings from this study.

Recommendations for future research

As this study has explored the validity of the CIS in a UK sample consisting of mainly female non-meditating undergraduate students between the age of 18-24 years, future research would need to replicate this study using a more diverse population, including meditators, and be conducted across different cultures in order to establish whether or not the CIS is a valid measure of insight in both Eastern and Western cultures.

Whilst the distinction between FG-MBIs and SG-MBIs has been made, comparison studies to ascertain whether the FG-MBI or SG-MBI approach is most effective for a given population have yet to be conducted. Therefore a measure such as the CIS could be used in research which aims to 'dismantle' FG-MBIs and SG-MBIs to explore the mechanisms of

action of each approach and to establish the full clinical applications and efficacy of SG-MBIs compared to FG-MBIs (Van Gordon et al., 2015).

To mirror the success of the application of FG-MBIs within clinical populations, to be able to explore whether SG-MBIs would be equally effective in this population, a valid measure of insight, such as the CIS, would need to be established. Indeed, numerous authors have recommended that schizophrenia spectrum disorders, bipolar disorder, posttraumatic stress disorder, depression, and risk factors for psychosis (e.g., schizoid personality disorder) are contraindications to participation in an MBI that is not specifically tailored to one of these conditions (Van Dam et al., 2017). Future research would therefore benefit from conducting validation studies of the CIS with different clinical populations to assist with future research of SG-MBIs in clinical settings.

Implications for Forensic Clinical Psychology

With the prevalence of mental health issues in both secure forensic settings and prisons, and the popularity of ‘third wave’ cognitive behavioural approaches which incorporate mindfulness (MAPPG, 2015), it could be argued that SG-MBIs could complement existing FG-MBIs and offender rehabilitation models in this population. For example, self-compassion and loving-kindness has been suggested to help improve psychological wellbeing, target criminogenic needs, and reduce offending behaviour in offender populations (Morley et al., 2016; Murphy et al., 2005; Shonin et al., 2013; Stosny, 1995). Furthermore, the incorporation of spirituality would complement the strengths-based offender rehabilitation model, Good Lives Model (GLM; Ward and Stewart, 2003), which hypothesises that individuals commit offences because they lack the capabilities to realize

valued outcomes (primary goods) in personally fulfilling and socially acceptable ways, with spirituality being identified as one of the ten primary goods.

As illustrated above, as there appears to be utility in exploring the role of SG-MBIs in forensic clinical settings and by having a validated tool that measures insight, a key feature of SG-MBIs, this would help to advance research in this area.

Conclusions

Whilst there has been criticism that FG-MBIs have removed mindfulness from their Buddhist roots, along with the benefits of developing SG-MBIs which aim to incorporate some of these Buddhist teachings, there is a need for valid measures to ascertain whether the addition of Buddhist concepts to MBIs is a worthwhile addition that ultimately leads to beneficial changes for meditators.

This study is the first to attempt to validate a Buddhist-oriented insight measure in a Westernised sample. Whilst these preliminary findings show promise, future research is needed to validate such a measure in both Eastern and Western cultures, and in various populations within cultures. Once established, this measure could pave the way for research into SG-MBIs in both Eastern and Western cultures to see if such interventions could yield similar or greater benefits in areas such as health, education , the workplace, and the criminal justice system, as has been shown up to this point with FG-MBIs (MAPPG, 2015).

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CHAPTER 3

PUBLIC DISSEMINATION DOCUMENT

A REVIEW OF MEDITATIVE APPROACHES IN CORRECTIONAL SETTINGS AND THE VALIDATION OF A MEASURE OF A BUDDHIST-DERIVED CONCEPT OF MINDFULNESS (INSIGHT) IN A UK UNDERGRADUATE UNIVERSITY SAMPLE

This chapter provides an overview of the literature review and empirical study carried out by Lorna Smith as part of the Doctorate in Forensic Clinical Psychology at the University of Birmingham.

Literature Review - A Systematic Review of Meditative Approaches to Improving Wellbeing, Targeting Criminogenic Needs and Reducing Recidivism in Correctional Settings

Background

With the prison population increasing, safety in prisons declining, and the increase in mental health and substance misuse issues in the prison population, there is a need to offer effective interventions to target these issues and help to lower re-offending following release from prison. In the past, research has explored whether meditation can help to address these issues in offender populations. The aim of this review is to bring together this research to assess the quality of this research and to see whether meditation has shown to be effective in improving wellbeing and reduce re-offending in prisoner populations.

Method

A search of the literature resulted in 21 studies being reviewed using the Quality Assessment Tool for Quantitative Studies (EPHPP, 2010).

Findings

5 studies were rated as 'strong', 3 studies were rated as 'moderate', and 13 studies were rated as 'weak'. Meditation was found to improve psychological wellbeing (e.g. reduce anxiety, depression, stress and trauma-related symptoms), physical wellbeing (e.g., improve sleep), reduce risk factors that are thought to increase the likelihood of someone committing

an offence (e.g., anger, self-esteem, impulsivity and substance misuse), and to reduce re-offending. However two studies also found that meditation may have led to increases in self-judgement and shame, and that prisoners who meditated for less than 4 weeks reported lower self-esteem and self-compassion than prisoners who did not meditate.

Conclusions

Whilst meditation approaches have shown to be beneficial in offender populations in terms of improving psychological and physical wellbeing, reducing risk factors considered to increase the likelihood of offending, and reducing re-offending rates, 61.9% of the studies were rated as 'weak' in the overall quality of the research carried out. Further high quality research is therefore recommended to confirm the findings from the studies included in this review, as well as exploring potential adverse effects for prisoners engaging in meditation in correctional settings that may worsen psychological and/or physical wellbeing or increase the risk of current or future re-offending. There may also be benefit to exploring more Buddhist-based meditation interventions and whether meditation may help to improve staff wellbeing.

Empirical Paper – The Validation of a Measure of a Buddhist-derived Concept of Mindfulness (Insight) in a UK Undergraduate University Sample

Background

Whilst there has been a lot of research over the last 20 years on the benefits of mindfulness in areas such as health, education, the workplace and the criminal justice system, some authors have highlighted that definitions of what is considered to be ‘mindfulness’ can vary. As there have been quality issues in previous research that has looked at mindfulness interventions, authors have warned that this research “may lead public consumers to be harmed, misled, and disappointed” (Van Dam et al. 2017, p. 1) . One criticism of mindfulness-based interventions (MBIs) in Western societies is that mindfulness skills are being taught separately from the Buddhist teachings from which mindfulness originated which are thought to contribute towards the effectiveness of mindfulness-based approaches. One such Buddhist teaching is that of ‘insight’ into the three characteristics of human existence: *Dukkha* (suffering is an inevitable part of life), *Anicca* (everything is impermanent), and *Anatta* (there is no true existence of a separate self), which is said to promote psychological wellbeing and reduce psychological distress. There is however no current measure of Buddhist insight that has been shown to be reliable or valid in cultures that practice more Westernised mindfulness approaches. This study therefore aimed to explore whether a measure of Buddhist insight, the Cognitive Insight Scale, which was originally developed by Jarukasemthawee et al. (2020) in a Thai population, would accurately measure insight in a UK population sample.

Method

484 undergraduate university students were asked to complete the Cognitive Insight Scale along with 6 additional questionnaires measuring levels of mindfulness and wellbeing online. These results were analysed using a method known as Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to check to see whether the items and the subscales of the Cognitive Insight Scale accurately measured Buddhist insight with respect to the three characteristics of human existence in UK undergraduate students.

Findings

The EFA analysis revealed that changing the Cognitive Insight Scale from consisting of 7 subscales (or factors) to 5 subscales (or factors) would provide a better measure of Buddhist insight in this population. The CFA analysis showed that the Cognitive Insight Scale was a 'moderately' accurate measure of Buddhist insight in the UK undergraduate sample.

Participants showed the tendency to score higher on the Cognitive Insight Scale if they were male, were older (25-34 years old), or had meditated regularly (at least 3 times a week during the last two weeks).

Further analysis revealed that the Cognitive Insight Scale was similar to other mindfulness measures and was associated with, on the whole, positive wellbeing, as was predicted. There was however found to be an increase in negative emotions and psychological inflexibility with higher scores on the Understanding of Suffering subscale, which highlights the potential for concepts related to mindfulness such as insight leading to unwanted outcomes.

Conclusions

Whilst these initial findings show promise, future research is needed to confirm whether the Cognitive Insight Scale is an accurate measure of Buddhist insight in Western cultures. Future research will need to replicate this study using different samples.

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APPENDICIES FOR VOLUME ONE

Appendices for Literature Review

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

Component Rating:

- **Strong** – the selected individuals are very likely to be representative of the target population (Q1 is 1) **and** there is greater than 80% participation (Q2 is 1).
- **Moderate** – the selected individuals are at least somewhat likely to be representative of the target population (Q1 is 1 or 2); **and** there is 60-79% participation (Q2 is 2). 'Moderate' may also be assigned if Q1 is 1 or 2 and Q2 is 5 (cant' tell).
- **Weak** – the selected individuals are not likely to be representative of the target population (Q1 is 3); **or** there is less than 60% participation (Q2 is 3) **or** selection is not described (Q1 is 4); and the level of participation is not described (Q2 is 5).

B. Study Design

Study design

Was the study described as randomised? Yes/No

If Yes, was the method of randomisation described? Yes/No

If Yes, was the method appropriate? Yes/No

Component Rating:

- **Strong** – will be assigned to those articles that described RCTs and CCTs.
- **Moderate** – will be assigned to those that described a cohort analytic study, a case control study, a cohort design, or an interrupted time series.
- **Weak** – will be assigned to those that used any other method or did not state the method used.

C. Confounders

Q1 – Were there important differences between groups prior to the intervention?

1. Yes
2. No
3. Can't tell

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

Component Rating:

- **Strong** – will be assigned to those articles that controlled for at least 80% of relevant confounders (Q1 is 2); **or** (Q2 is 1).
- **Moderate** – will be given to those studies that controlled for 60-79% of relevant confounders (Q1 is 1) **and** (Q2 is 2).
- **Weak** – will be assigned when less than 60% of relevant confounders were controlled (Q1 is 1) **and** (Q2 is 3) **or** control of confounders was not described (Q1 is 3) **and** (Q2 is 4).

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

Component Rating:

- **Strong** – the outcome assessor is not aware of the intervention status of participants (Q1 is 2); **and** the study participants are not aware of the research question (Q2 is 2).
- **Moderate** – the outcome assessor is not aware of the intervention status of participants (Q1 is 2); **or** the study participants are not aware of the research question (Q2 is 2); **or** blinding is not described (Q1 is 3 and Q2 is 3).
- **Weak** – the outcome assessor is aware of the intervention status of participants (Q1 is 1); **and** the study participants are aware of the research question (Q2 is 1).

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

Component Rating:

- **Strong** – the data collection tools have been shown to be valid (Q1 is 1); **and** the data collection tools have been shown to be reliable (Q2 is 2).
- **Moderate** – the data collection tools have been shown to be valid (Q1 is 1); **and** the data collection tools have not been shown to be reliable (Q2 is 2) **or** reliability is not described (Q2 is 3).
- **Weak** – the data collection tools have not been shown to be valid (Q1 is 2) or both reliability and validity are not described (Q1 is 3 and Q2 is 3).

F. Withdrawals and Drop-Outs

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

1. **Yes** – if the authors describe BOTH the numbers and reasons for withdrawals and drop-outs.
2. **No** – if either the numbers or reasons for withdrawals and drop-outs are not reported.
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)**

Component Rating:

- **Strong** – will be assigned when the follow-up rate is 80% or greater (Q2 is 1)
- **Moderate** – will be assigned when the follow-up rate is 60-79% (Q2 is 2) **or** Q2 is 5 (N/A)
- **Weak** – will be assigned when a follow-up rate is less than 60% (Q2 is 3) or if the withdrawals and drop-outs were not described (Q2 is 4).

G. Intervention Integrity (adapted)

Q1 – Did the meditation intervention follow a set protocol?

1. Yes
2. No
3. Can't tell

Q2 – Was the consistency of the intervention/fidelity of implementation measured?

1. Yes
2. No
3. Can't tell

Q3 – Did the facilitators have formal training in the intervention and/or personal meditation experience?

1. Yes
2. No
3. Can't tell

Q4 – Is it likely that participants received an unintended intervention (contamination or co-intervention) that may influence the results?

1. Yes
2. No
3. Can't tell

Component Rating:

- **Strong** – when the intervention followed a set protocol (Q1 is 1) **and** the consistency of the intervention was measured (Q2 is 1)
- **Moderate** – when the intervention followed a set protocol (Q1 is 1) **and** either the consistency of the meditation was not measured or you are unable to tell (Q2 is 2 or Q2 is 3) **and** either the facilitators had formal training and/or personal meditation experience or you are unable to tell (Q3 is 1 or Q3 is 3)
- **Weak** – when it was likely that participants received an unintended intervention that may have influenced the results (Q4 is 1) **or** the meditation intervention either did not follow a set protocol or you are unable to tell (Q1 is 2 or Q1 is 3)

H. Analyses

Q1 – Are the statistical methods appropriate for the study design?

1. Yes
2. No
3. Can't tell

Q2 – 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

Component Rating:

- **Strong** – when the statistical methods are appropriate for the study design (Q1 is 1) **and** the analysis is performed by actual intervention received rather than intention to treat (Q2 is 2)
- **Moderate** – when the statistical methods are appropriate for the study design (Q1 is 1) **and** the analysis is performed by intention to treat rather than actual intervention received (Q2 is 1)
- **Weak** – when the statistical methods are not appropriate for the study design (Q1 is 2) **and** the analysis is performed by intention to treat rather than actual intervention received (Q2 is 1)

GLOBAL RATING FOR THIS PAPER:

1. **Strong** - (no WEAK ratings)
2. **Moderate** - (one WEAK rating)
3. **Weak** - (two or more WEAK ratings)

Appendices for Empirical Paper

APPENDIX 2- Cognitive Insight Scale (CIS)

This questionnaire is composed of questions about experiences, thoughts and feelings that may happen in your life. Please answer the following questions to reflect your actual experiences rather than thoughts or expectations that you wish to happen. There is no right or wrong answer.

0	1	2	3	4	5
Not true of my experience	Slightly true of my experience	Sometimes true of my experience	Frequently true of my experience	Very true of my experience	Always true of my experience

Item No.	Item Statement
1	I calmly accept physical suffering is a part of being human
2	I fully accept that suffering is natural and normal
3	I experience and accept that my suffering and that of my loved ones results from conditions prevailing at the time
4	I recognise that suffering occurs from the restlessness of my mind
5	I have experienced that many times suffering occurs to me because I try to control things to remain the same
6	I am aware and calmly accept that my feelings and emotions change constantly
7	I know that, regardless of whether it is happiness or distress that occurs to me, in the end it will gradually fade away
8	When events I like are ending or passing, I understand and accept that as reality
9 (reversed)	I dislike changes that occur every day
10	I feel harmoniously a part of everything around me
11	I am aware that my "self" and my body is composed of natural and changeable elements
12	From my experience, I know that nature and all around me are just what they are, nothing can control or force them to be like that
13 (reversed)	When I lose what I love, I feel strongly upset for I believe that nothing could replace it
14 (reversed)	I am better than average because I have the abilities to be a special person, above and beyond others
15	Even when misfortunes occur, I can still live my life because misfortunes are the inevitable facts of life
16	I accept with understanding the inevitability of suffering as part of being human
17	I find that unhappiness and emotional distress results mainly from my own thinking and actions
18	My experience shows me everything in life comes and goes
19	When I encounter unexpected changes, I stay calm and feel secure
20 (reversed)	I cannot stand it when my loved ones change rather than remain constant as I want them to
21	I feel that everyone and everything is interconnected and inseparable

22	Suffering occurs because of my longing for this or that
23	When events that I like are ending or passing, I do not try to cling on to them
24	I feel true happiness when I experience that I am harmoniously a part of all around me
25 (reversed)	When facing an unsatisfactory or upsetting event, I take a long time to accept it
26	When suffering, I observe with understanding that suffering is a part of life
27	I regularly remind myself that the cause of suffering is clinging and excessive attachment
28	I accept all the changes that occur in my body over time, as it is natural and normal
29 (reversed)	I find that the thoughts or beliefs I have are hard for me to change
30	I am aware that I am just a small element of this great universe
31 (reversed)	I do not like others to be more outstanding than me
32	I accept with understanding the suffering that I experience in life
33	I recognise with understanding that things always change with the passage of time
34	I am always aware that I, everyone, and everything are interconnected
35 (reversed)	On the whole I am greater and more powerful than others
36	I calmly accept the discomfort when I am physically unwell
37	I am aware and accepting that nothing stays the same forever
38	When an event that I like or feel happy about is about to pass, I accept and do not feel longing for more
39 (reversed)	I'm stressed and shaken up when having to encounter unanticipated and unwanted changes
40 (reversed)	Often times, when I want something badly enough, I'll do everything to get it without thinking about people around me
41 (reversed)	When things don't go as I wish, I feel highly distressed
42 (reversed)	When an event upsets me, I wait anxiously for it to go away quickly
43	With or without noticing, I experience that changes always occur to everything
44 (reversed)	I believe that, if I try my very best, I can usually control things so that they will not change and will stay as I wish

APPENDIX 3 - Ethical Approval for Research Project

**Re: “UK validation of the Mindfulness Insight Scale”
Application for Ethical Review ERN_18-0227**

Thank you for your application for ethical review for the above project, which was reviewed by the Science, Technology, Engineering and Mathematics Ethical Review Committee.

On behalf of the Committee, I confirm that this study now has full ethical approval.

I would like to remind you that any substantive changes to the nature of the study as described in the Application for Ethical Review, and/or any adverse events occurring during the study should be promptly brought to the Committee’s attention by the Principal Investigator and may necessitate further ethical review.

Please also ensure that the relevant requirements within the University’s Code of Practice for Research and the information and guidance provided on the University’s ethics webpages (available at <https://intranet.birmingham.ac.uk/finance/accounting/Research-Support-Group/Research-Ethics/Links-and-Resources.aspx>) are adhered to and referred to in any future applications for ethical review. It is now a requirement on the revised application form (<https://intranet.birmingham.ac.uk/finance/accounting/Research-Support-Group/Research-Ethics/Ethical-Review-Forms.aspx>) to confirm that this guidance has been consulted and is understood, and that it has been taken into account when completing your application for ethical review.

Please be aware that whilst Health and Safety (H&S) issues may be considered during the ethical review process, you are still required to follow the University’s guidance on H&S and to ensure that H&S risk assessments have been carried out as appropriate. For further information about this, please contact your School H&S representative or the University’s H&S Unit at healthandsafety@contacts.bham.ac.uk.

Kind regards,

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Web: <https://intranet.birmingham.ac.uk/finance/RSS/Research-Support-Group/Research-Ethics/Research-Integrity-at-the-University-of-Birmingham.aspx>

Please remember to submit a new [Self-Assessment Form](#) for each new project.

Click [Ethical Review Process](#) for further details regarding the University's Ethical Review process, or email ethics-queries@contacts.bham.ac.uk with any queries.

Click [Research Governance](#) for further details regarding the University's Research Governance and Clinical Trials Insurance processes, or email researchgovernance@contacts.bham.ac.uk with any queries

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