Investigating the Feasibility and Efficacy of Mindfulness Based Stress Reduction (MBSR) in Enriching Community Well-being within Areas of Socioeconomic Deprivation (SED)

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Abstract

Prolonged exposure to 'toxic stress' caused by financial hardship and social exclusion can result in reduced well-being, increased risk of illness, impaired cognitive function and can negatively impact the physiological processes underlying ageing. Evidence suggests that mindfulness-based stress reduction (MBSR) programmes can reduce stress and improve well-being in clinical and non-clinical populations and recent studies indicate they may also help address well-being related effects of poverty. This study aimed to evaluate the feasibility of delivering MBSR training to adults living with the psychosocial stress caused by poverty and its effectiveness in improving participants' well-being. Forty adults ($n = 20$ in the training group) from regeneration areas earning less than the Living Wage completed this mixed method, non-randomised wait-list controlled feasibility pilot study. Delivery proved feasible, even though, as with previous studies on psychosocial interventions in low Socioeconomic Deprivation (SED) areas, the rate of participant attrition from recruitment to completion was high (58%). The results showed significant increases in well-being post training for the training group only ($p < 0.001$). No changes in mindfulness were found in either group. Further qualitative analyses suggested a possible shift in participants' conceptualization of well-being from being difficult to manage to workable. These results suggest that MBSR training can be feasibly delivered within low SED communities and potentially improve the well-being of course participants. The practicalities of developing accessible mindfulness-based programmes for those living in areas of multiple deprivation are discussed.

Introduction

Mindfulness-Based Interventions (MBIs), namely mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT), combine basic Buddhist philosophy and mindfulness practices with the modern psychological understanding of stress and cognitive processes (Chiesa and Malinowski 2011). They are structured in eight-week, group programmes (Kabat-Zinn 1982) where participants learn to pay attention non-judgementally and develop a metacognitive awareness of present moment experience (Kabat-Zinn 1990). A recent review highlighted the potential of meditation-based programs in reducing, and partially reversing, some of the negative neurocognitive effects of severe stress (Fox et al., 2014). One of the most potent long-lasting stressors is the ‘toxic stress’ of poverty (Eisenberger 2012), which is known to alter brain structure and cognitive function (Davidson and McEwen 2012; Kim et al. 2013; Noble et al. 2012) and is associated with mental illness (Galea et al. 2011), substance abuse (Ahern et al. 2008) and higher risk of suicide (Dupéré et al. 2009).

Relative poverty, as defined in most organisation for economic co-operation and development (OECD) countries, means living on less than 60% of normal household income after compulsory deductions (Chen and Ravallion 2010; Palmer 2015). A strong positive correlation between debt and poor physical and mental health has been found (Richardson et al. 2013). Socioeconomic success, in contrast, is associated with economic growth and upward social mobility. However, economic crises, stock market bubbles and student loan poverty is causing a decline in both growth and upward mobility. This has affected the earning power and opportunities for the socioeconomically disadvantaged

(McKnight 2015). This trend is further magnified by the fact that familiies with a higher socioeconomic status (SES) have a privileged access to education and connections. It leads to “opportunity hoarding” (Reeves and Howard 2013) by those from a more economically privileged backgrounds (Kenealy 2015) and fewer employment opportunities for talented individuals from low SED backgrounds. When entrenched, it results in the ‘2½ percent of every generation’ stuck in a lifetime of disadvantage, harm and genetic change (Cabinet Office 2006), that may affect brain development and long-term health for several generations (Rechavi et al. 2014; Shonkoff and Garner 2012).

Initial evidence suggests MBIs may reduce stress and improve well-being in both clinical and non-clinical populations, even though the strength of the cumulative evidence seems to vary across reviews and meta-analyses. For example, Grossman and colleagues (2004) meta-analysis of clinical quantitative studies (*N* = 20 studies) found that MBIs significantly improved both mental and physical health related outcomes. However, a more recent review and meta-analysis of 47 clinical and non-clinical studies suggested moderate reductions in anxiety, depression and pain, and low effects on reduction in stress and mental health related quality of life (Goyal et al., 2014). Several researchers have highlighted the complexity of the relationship between mindfulness and well-being (e.g, Chambers et al., 2009), including possible contribution of other variables impacting on well-being (Carmody and Baer, 2008). For example, Malpass et al. (2012) identified a shift in participant’s self-identity and the way they related to their illness after mindfulness training, this shift maps onto a dimension of well-being known as well-being ‘within illness’ which refers to the awareness and ability to flexibly adapt to the continual changes in the experience

of illness (Carel, 2009; Doran, 2014). Doran (2014) found that the acceptance which is cultivated through mindfulness training, is key to improving well-being.

Nevertheless, some studies suggested that MBSR training, and improvement in mindfulness as such, can enhance well-being – for instance, Nyklíček and Kuijpers (2008) found reductions in stress and vital exhaustion as well as improvements in positive affect and quality life in a community sample of adults with distress. Importantly, improvements in mindfulness seemed to mediate the reductions in perceived stress and improvements in quality of life in this study. Furthermore, Eberth and Sedlmeier's (2012) meta-analysis (N = 39 studies) on the effects of MBI's on various psychological variables found MBI’s to have a strong positive effect on subjective well-being (SWB). In contrast, however, Wenzel et al. (2015) found that the association between MBIs and SWB depended on variables such as neurosis and training/test group composition (i.e. whether the sample consisted of university students or employed participants).

Early reports of the health benefits of MBI’s for SED individuals are anecdotal (Kabat-Zinn, 2004), with little definitive evidence (only approx. 12 studies currently available). Perhaps the earliest of these was Roth and Creaser's (1997) evaluation of their income-based adapted MBSR programme for SED patients in an inner city health centre. The study did not include a control group and the dropout rate was high (60%). Roth and Robbins (2004) replicated and expanded the study and remedied shortcomings by adding a control group and 12-month follow-up. The completion rate was 66% and they found improvements in aspects of quality of life including psychological distress and

well-being, social and emotional functioning, in addition a trend towards improvements in mental health was also found.

In a more recent study, Hick and Furlotte's (2010) evaluated Radical Mindfulness Training (RMT), based on MBSR, to improve well-being for the *severely* economically disadvantaged in a community governed not-for-profit Health Centre. Their programme aimed to change participants' (*N* = 8) cognitive and affective judgments of self, others, institutions and societal structure. Despite this being a small and uncontrolled study, results were encouraging and course evaluations positive. Specifically, improvements in self-reports of self-compassion and satisfaction with life were found after the course. Qualitative themes suggested reperceiving (shift in perspective on cognitions and self, see Shapiro et al., 2006) after the training made participants' difficulties and attitudes towards others, institutions and societal structure less reactive. However, even with participant-led course adaptations, cash payments, funded travel and childcare, the dropout rate was high (64%), suggesting that this is an issue which needs further consideration in future courses and studies with this population.

Another set of studies explored the potential of MBI's in increasing well-being of women in various SED environments. Abercrombie et al. (2007) found in their adapted MBSR based study with SED women who had abnormal pap smears that after mindfulness training the women were more likely to attend consultations due to reductions in anxiety. Vallejo and Amaro's (2009) developed Mindfulness-Based Relapse Prevention for Women (MBRP-W) and in a study with African American and Latino women of low SES from mixed outpatient and residential substance abuse programmes, they found that the course had high levels of satisfaction and acceptability for those who attended (*N* = 60), but drop-

out rates were high (63%). Another study investigated an adapted MBSR course (ELDERSHINE) for older adults (all women, *N* = 13, ≥ 60 years) in a low income residential programme. This study found that participants regularly implemented mindfulness to cope with medical procedures, anger and depression (Szanton et al. 2011) . This ELDERSHINE program was further piloted in a randomised controlled trial with lower income older adults with hypertension (Palta et al. 2012). Participants were randomised into the mindfulness programme (n = 12) or an active control consisting of a social support group (n = 8). Significant reductions in blood pressure were found in completers (> 80%).

Community care facilities for the homeless and a community hospital were the setting for Dutton et al's (2013) study with domestically abused (PTSD history) mixed race women (*N* = 106, half in the MBI arm). Here, an adapted MBI was tested as an alternative to traditional mental health services. The programme was found to be both feasible and acceptable -- there was a high completion rate (70%), perhaps due to reparations for travel and childcare. Informal practice was found to be preferred over formal home practice. Participants reported an increase in non-reactivity, self-acceptance, empowerment and a sense of belonging and particularly appreciated the support gained from being part of a group. However, no evaluations of changes in mental health service use were conducted.

Whist small scale, Bermudez et al. (2013) study investigated longer-term effects of MBI training with a similar sample. The longitudinal qualitative study over 15 months was conducted in a women's shelter (*N* = 10) and found that completers experienced an increase in confidence, serenity and self-compassion, which developed into a desire to help those in comparable

situations after the mindfulness training. However, participants were dealing with trauma and found it difficult to practice mindfulness to begin with, accordingly, the attrition rate was high (81%). Group homogeneity, management of inter-personal conflict, and a regulation of exposure to present moment experience were acknowledged as the key components for future similar courses with this population to increase retention of participants.

Other studies investigated the potential of MBI's in supporting the well-being of parents affected by SED. Eames et al. (2015) conducted an uncontrolled study which utilised an MBSR-based Mindfulness-Based Well-being for Parents (MBW-P) programme. It was held in a rural National Health Service setting in the UK and designed for 'at risk', hard to reach mothers (*N* = 9 to 13 depending on the measures completed). The study aimed to assess parental well-being and parenting-related stress. It featured shorter 'in session' and 'home practices', which incorporated mindful listening and communication, included social interaction and, introduced short instructions in parental bonding, compassionate parenting and the maintenance of personal well-being. Results were encouraging but need to be interpreted with caution given the small sample size, high attrition rate (48%) and a lack of control group or follow-up. However, a 56% reduction in stress and increased well-being for the most 'at risk' suggested that SED parents may become easier to reach and engage with, and consequently, more likely to benefit from other parenting programmes after MBW-P.

Van der Gucht et al. (2014) also chose institutional settings, in this case social welfare centres that serve low-income adults in the Netherlands. They combined MBSR and MBCT curriculums with shorter exercises and contextual psychoeducational examples like the stress felt due to living with less money than

needed and learning to deal with difficult conversations. Despite adaptations, attrition was high (only 40% completed all measures) and effect sizes on measures of stress, depression and anxiety were small post-intervention and medium at follow-up. However, this study highlighted that MBIs reduce (negative) self-directed overgeneralisation and consequently, vulnerability to depression. The study, however, lacked a control group.

As a whole, and despite high attrition rates and lack of control groups, these studies suggest that suitably adapted MBIs are feasible, acceptable and can be beneficial for SED populations. They seem to positively affect clinic attendance rates (Abercrombie et al. 2007; Roth and Creaser 1997) and ameliorate factors of comorbidity for SED participants in outpatient and residential rehabilitation programmes (Vallejo & Amaro 2009). They also appear to improve the quality of life of SED elderly in residential care (Palta et al. 2012; Szanton et al. 2011) and show promising results in institutional settings (Eames et al. 2015; Van der Gucht et al. 2014). These interventions may also bring about a re-perceiving of the stress of poverty and authority (Hick and Furlotte 2010). However, the paucity of the studies indicates the need for more research and more robust investigations within this fledgling field.

Building on the previous research, this study aimed to investigate the feasibility and impact of MBSR in a community welfare centre in Whitfield, a community regeneration area (Robertson 2014) in Dundee, Scotland, which has almost three times the national average (30.7%) of income and employment deprivation. Ten percent claim welfare benefits, and 0.5% of those, (the poorest), experience employment deprivation and are barely able to afford meals, fuel or

even a funeral (Dundee Partnership 2011; Kenway et al. 2015; Mcbride and Purcell 2014; Scottish Government, 2012).

This study is of relevance to UK policies regarding the importance of supporting well-being in SED areas (Berry, 2014; Stiglitz et al., 2009). It is also timely, in that David Lammy MP, Chair of the all-party Parliamentary Group on Wellbeing Economics recently commented that “austerity makes a focus on wellbeing more essential, not less” (Berry 2014, p. 2).

In summary, previous research, government guidelines and socio-economic statistics indicate a need for further investigation into the role that MBIs could play in the development of well-being for the deprived within SED areas. This feasibility pilot study aimed to assess this by developing efficient recruitment protocols, examining acceptability of consent procedures, investigating and addressing barriers to attendance, assessing the feasibility of collecting reliable and valid data and, assessing the appropriateness/suitability of the intervention used. The study also evaluated the impact of the programme on well-being and the development of mindful awareness of participants, and their subjective perception of well-being.

Methods

Participants

One hundred and seven adults from Dundee’s most deprived areas were referred or self-referred to participate in an 8 week MBSR course. Two with severe mental health diagnoses were excluded, one attended the MBSR course but declined research participation and 104 provided an informed consent to take part in the research. Seventy-two undertook orientation for one of two 8-week

MBSR courses on a ‘first come first served’ basis and 32 were assigned to a waitlist control group. Thirty seven dropped out post-orientation (see Table 1), and twenty seven withdrew within three sessions. Training group completers (*n* = 20) attended the minimum effective dosage of four sessions (Eames et al., 2015) set for this project.

There were 40 research group completers. Eight declined (3 control and 5 MBSR training group), when asked to provide age demographics. MBSR training group completers (*n* = 15) ages ranged from 18 to 65 (50% male/female), average 58 years. Control group completers (*n* = 20) ages ranged from 18 to 60 (25% male; 75% female), average 56 years. Seventy percent of the training and 45% of the control groups were single, with the remainder married (20%, 30%) or co-habiting (10%, 5% preferred not to say).

Data also revealed that participants experienced marginalisation (two participants with literacy issues both in the training and in the control group, two participants with learning disability in the training group and one in the control group, one carer in the training group). Twenty nine completers (*n* = 20 training; *n* = 9 control) provided mental and physical health information (see Fig. 1a and Fig. 1b) in the pre-course assessment. Although 55% of the control group omitted giving demographic information, data received revealed a variety of mental health issues for both groups e.g., anxiety, depression, stress and mood disorder, although the control group were less affected by each. Training group issues ranged from mobility, to cancer and obesity, with both reporting, physical/nerve pain and high cholesterol. In addition, participant’s reports on socioeconomic factors showed that all in the training group and the vast majority of those in the control group were receiving benefits (See Fig. 1c). They also reported being

single parents, experiencing relationship breakdown and low income as socioeconomic factors.

Fig. 1

Demographic information for the training group (*n* = 20) and control group (*n* = 9) completers including **a)** mental health information, **b)** physical health information and **c)** socioeconomic factors.

Procedures

Posters, flyers and application forms were disseminated through community support professionals via the course venue, local community facilities, groups, charities and a local charities website which supports those in hardship. Inclusion criteria comprised those living in regeneration areas in Dundee and receiving benefits or earning less than the Living Wage (Davis et al., 2014) with no significant life trauma in the previous six months. Applications were evaluated and primary assessments employed in accordance with MBCT Implementation Resources for public MBCT/MBSR courses and the Screening Criteria for Exclusion from the Stress Reduction Program (Kuyken et al., 2012).

Intervention

Eligible participants were invited by telephone, e-mail and text message to attend a pre-course assessment and orientation session of two hours to discuss course content, commitments, research and expectations (see Appendix L, session agenda). They were informed that mindfulness, using Blacker et al's (2009) MBSR programme of 8 weekly 2 hour group sessions would be taught to help reduce their stress. This involved employing body/breath awareness while

sitting, standing, lying and moving and a three-step mini meditation containing the core practice elements used in MBI's (Williams et al., 2007).

To facilitate non-discriminatory participation, combat financial exclusion and reduce material inequalities (Curtis et al., 2002) during the course, all course materials and equipment was offered free. This included course manuals in digital and printed form and audio for those with special needs such as dyslexia, learning difficulties or literacy issues, large text for those with visual impairment, recordings in CD and mp3 formats for laptops, tablets and smartphones and, ancillary equipment (blankets, yoga mats and cushions), which was provided by a local charity, the Nilupul Foundation, (www.nilupul.org).

To address the effects of marginalisation and exclusion (Kenway et al., 2015), two 'in-session' support assistants' attended, and between sessions, participants were encouraged to seek support through 'course buddies' (Rockville, 1994) e.g., a fellow course/family member, friend or colleague, to discuss experiences, encourage home practice participation and course completion. Furthermore, texts and e-mail reminders were sent, pre-session interaction (tea/conversation) encouraged, and, in-session, extended dialogue and inquiry into experiences fostered. To reduce psychosocial inequalities - e.g., having a low threat threshold and its resultant physical, mental or verbal 'reactive stress' to the perceived threat of interpersonal communication (Adli, 2011) - dyads, triads and small groups were also utilised, to build confidence, increase social integrity and develop a willingness to address and discuss feelings (Egan et al., 2008). Further adaptations were made 'on the hoof' by the mindfulness course teacher (first author), including slightly shorter practices with plain

language instruction. A simplified visual presentation of the psychoeducational stress component was also added to aid the educationally challenged.

Data collection

The study followed a non-randomized waitlist controlled design with all assessments conducted before the start of the MBSR training and immediately after its completion. Data from training group were collected at the pre-course orientation session and then on the last day of the course. Data from the control group were collected at the same time points. Quantitative assessments were complemented by a qualitative subjective self-assessment of the meaning of well-being at the two time points. Where needed, participants were supported through a question by question guided run through the measures.

Measures.

Quantitative measures included the WHO-5 Well-being Index and the Mindfulness Attention and Awareness Scale (MAAS), in addition to two quantitative custom-made well-being assessments and a qualitative open ended question (the last three measures were designed by the first author).

The WHO-5 is a widely used self–report measure (Taggart and Stewart-brown, 2015; Topp et al., 2015), developed for the purpose of assessing positive mental health (Bech et al., 2003). It has five items scored from 0 to 100. High scores signify better well-being and low scores indicate mental health problems (Henkel et al., 2003). In a study on well-being with chronic illness sufferers validities of *content* (0.77), *construct* ($r = -0.57$, $p < .01$) and *criterion relation* ($r = 0.49$, $p < 0.001$) were good or high and *internal consistency reliability* was high (Cronbach's $\alpha = 0.89$; Wu 2014).

The MAAS is a 15-item self-report scale assessing openness or receptive awareness of and attention to what is taking place in the present. It showed strong psychometric properties when validated with college, community and cancer patients, and the scores are predictive of a variety of self-regulation and well-being constructs (Brown & Ryan, 2003). The measure takes 10 minutes or less to complete (Brown & Ryan, 2003) and has demonstrated high *internal reliability* (Cronbach's $\alpha = 0.89$) and good *gender reliability* (women $\alpha = 0.89$; men $\alpha = 0.87$) (MacKillop and Anderson, 2007). Conner and White's (2014) study which used this measure with parents of mixed socioeconomic background of children with autism spectrum disorder showed an internal consistency of $\alpha = .90$.

The researcher-designed well-being assessments, comprised two common single-item survey questions in the form of a 5-point Likert self-rating scale of general well-being and mental well-being (from very bad to very good), as described and validated in a national survey of British adults (Bowling, 2011). The first question related to general well-being: 'Overall would you say your well-being was?', then rated on a 5-point scale from very bad to very good. The second question related to mental well-being: 'Please rate your mental well-being, would you say your mental well-being was? , then similarly rated on a 5-point scale from bad to very good.

Finally, the qualitative element of the evaluations aimed to explore more subjective associations of well-being provided by participants and their possible change from pre to post mindfulness training. It involved written responses to a single open-ended question designed by the first author in order to solicit participant's personal definition of well-being at two time points T1 and T2. The question asked, 'Please tell me, what the term well-being means to you?' and

advised, ‘You can mention as many things as you like, including mental or psychological and/or physical health issues, social relationships and activities and anything else you think of. There are no right or wrong answers’.

Data Analysis

Quantitative data were analysed using SPSS version 22. Descriptive statistics were computed, analysed and outliers removed. Prior to statistical analysis, an independent *t* test determined any difference between groups at baseline. When no baseline differences were detected, a two-way repeated measures analysis of variance ANOVA with factors of group (training and control) and time (pre and post) was employed to assess differences in well-being and mindfulness. Significant time by group interactions were followed up with t-tests to assess locus of the differences. Correlations in change scores (pre scores subtracted from post scores) investigated possible converging patterns of changes across the measures.

For qualitative data, written responses to an open ended question were transcribed and analysed using thematic analysis (Braun and Clarke, 2006) separately for responses pre and post training. Responses ranged from a series of *single words*, to *single and multiple phrases and single sentences*. These formed the primary themes or PT’s. PT’s were then grouped into meaningful *units of text* relevant to the research question. These groups were further refined to reveal refined primary themes (RPT’s). Further distillation of RPT’s revealed overarching themes (OAT’s), which were in turned refined to produced pre- and post- meta-themes. Finally, tentative changes between these themes from pre to post training explored. This process was iterative and correlated with the original responses and the research question at all stages. The thematic analysis

was conducted by the first author and checked for accuracy in analysis progression and exemplification of themes in participant quotes by the third author.

Results

Quantitative Analyses

The delivery of the adapted mindfulness-based interventions (MBIs) to socioeconomically deprived (SED) adults was proven to be feasible by the number of people interested participating in the course. However, the dropout rate was relatively high – 27 out of the initial 47 (58%) participants did not complete the study. Training group completers (*n* = 20) attended the minimum effective dosage of four sessions (Eames et al., 2015) set for this project. Seven of those attended up to five sessions and 13 completed between five to eight sessions. The attrition rates are summarised in Table 1. Reasons for drop out within three sessions were given by 21 participants, six gave no reason (see Table 2).

Table 1.

MBSR course attrition rates

	Cohort	Dropout post-orientation	Dropout within 3 sessions	Completers
Total (*N*)	104			
MBSR group (*n*)	72	25	27	20
Control group (*n*)	32	12	0	20

Table 2.

Reasons for dropout within three sessions.

Reason for dropout	Fear of violence	Unable to get up in time	Not the right time	Anxiety	Family issues
(*n*)	1	1	3	1	4
Reason for dropout	Health issues	Other commitments	Carer responsibilities	Homeless	Benefits sanctions
(*n*)	2	4	3	1	1

An initial 2 (group) x 2 (gender) chi square revealed no significant differences in gender across the two groups [X^2 = (1) = 3.65 *p* =.087, Cramer's V = .319]. Analysis was conducted for data from 36 participants (four participants were removed due to missing data). Data analysis was run with and without two moderate outliers at post-test (one outlier on the WHO-5 and one on the Mindfulness Attention and Awareness Scale; MAAS), no significant differences were found when outliers were removed and therefore the results reported are for the full data set (no outliers removed).

For the four self-report measures (WHO-5, Overall Well-being and Mental Well-being and MAAS, baseline group differences were assessed using independent samples t tests with no significant baseline group differences found for any of the four measures (all *p*'s > .05). See Table 3. for a summary of the means and standard deviations of each measure.

To measure changes in the four measures across time 2 (group: MBSR; Control) x 2 (time: baseline, post-test) mixed ANOVAs were conducted. For the WHO-5 there was a significant main effect of time [$F(1, 34) = 20.61$, $p <.001$, η^2

= .24] and group [$F(1, 34) = 13.02$, $p = .001$, $\eta^2 = .28$] and a significant time x group interaction [$F(1, 34) = 31.13$, $p < .001$, $\eta^2 = .36$]. Follow up t-tests revealed a significant increase in WHO-5 scores [$t(15) = -6.56$, $p < .001$, $d = -1.64$] from pre to post MBSR training in the training group only (control p > 0.05). The training group also showed significantly higher scores for the WHO-5 in between group comparisons as the post-test [$t(34) = -6.06$, $p < .001$, $d = -2.07$].

For the MAAS scores, no main effects or interactions were significant (all *p*s > .05).

For the General Well-being scores, there was a significant main effect of time [$F(1, 34) = 16.28$, $p < .001$, $\eta^2 = .24$] and a significant time x group interaction [$F(1, 34) = 16.28$, $p < .001$, $\eta^2 = .24$]. There was no significant main effect of group [$F(1, 34) = 3.07$, $p = .089$, $\eta^2 = .08$]. Follow up t-tests showed a significant increase in scores in the training group only [$t(15) = -4.679$, $p < .001$, $d = 1.17$] (control group $p > 0.05$). The training group also showed significantly higher scores in comparison to the control group at the post-test [$t(34) = -3.54$, $p = .001$, $d = -1.19$].

For the Mental Well-being scores, there was a significant main effect of time [$F(1, 34) = 8.55$, $p = .006$, $\eta^2 = .16$] and a significant time x group interaction [$F(1, 34) = 12.34$, $p = .001$, $\eta^2 = .22$]. There was no significant main effect of group [$F(1, 34) = 2.25$, $p = .14$, $\eta^2 = .06$] Follow up t-tests revealed a significant increase in scores in the training group [$t(15) = -3.88$, $p = .001$, $d = -0.97$], but not in the control group ($p > 0.05$). Significant differences between the two groups with the training group scoring higher where also found at the post-test [$t(34) = -3.16$, $p = .003$, $d = -1.06$].

The longitudinal changes in the four measures are depicted in Fig. 2.

Table 3.

A summary of the means and standard deviations for the total MAAS scores, WHO-5 scores, General Well-being and Mental Well-being scores at baseline and post-test for the MBSR and control groups.

Group		Pre-test		Post-test	
		M	*SD*	*M*	*SD*
MBSR group (*n* = 16)	Total MAAS	3.36	.49	3.50	.48
	General Well-being	2.81	1.11	4.06	.93
	Mental Well-being	2.69	1.25	3.78	.98
	WHO-5	38.05	18.87	73.08	15.79
Control Group (*n* = 20)	Total MAAS	3.11	.82	3.17	.84
	General Well-being	2.95	.83	2.95	.94
	Mental Well-being	2.85	.81	2.75	.97
	WHO-5	38.0	19.18	34.40	21.26

Fig. 2

Longitudinal changes for the MBSR group (*n* = 16) and wait-list control group (*n* = 20) for **a)** the WHO-5 self-report, **b)** General Well-being **c)** Mental Well-being and **d)** MAAS.

The change (pre scores subtracted from post scores) in WHO-5 scores across the training and control group was found to positively correlate with the change in General Well-being scores [$r(36) = .67$, $p < .001$] and the change in Mental Well-being scores [$r(36) = .60$, $p < .001$]. The change in General Well-being scores was also found to positively correlate with the change in Mental Well-being scores [$r(36) = .78$, $p < .001$]. The change in MAAS scores was not found to correlate with any of the measures (all *p*s > .05).

Qualitative Analyses

Qualitative data was collected from written responses to a single open-ended question “What does well-being mean to you?” pre- (T1) and post- (T2) training and analysed using thematic analysis (Braun & Clarke, 2006). All original written responses (word, phrases, and sentences) or primary themes (PT’s) were recorded verbatim and anonymised (coded) prior to analysis by the first author. To aid understanding and readability here, PT’s are italicised followed by participant codes in parenthesis. Analysis of the PT’s led to the formation of refined PT’s (RPT’s), which when distilled revealed sets of overarching themes (OAT’s). On summarising OAT’s, single Meta Themes emerged at both time points. These progressions are presented below in Figures 3a and 3b below.

Figure 3a. Outline of Pre - training thematic progression.

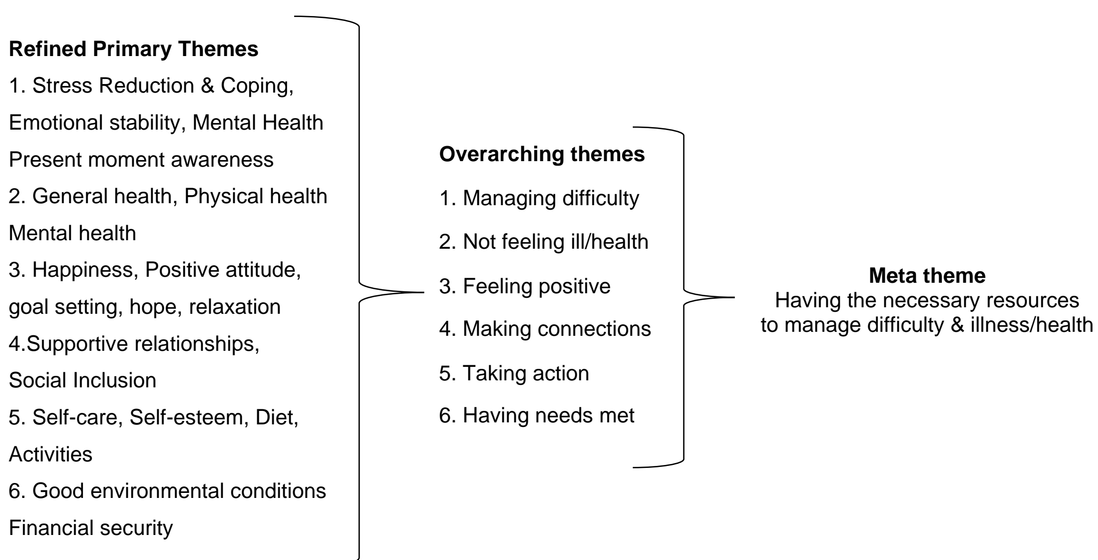
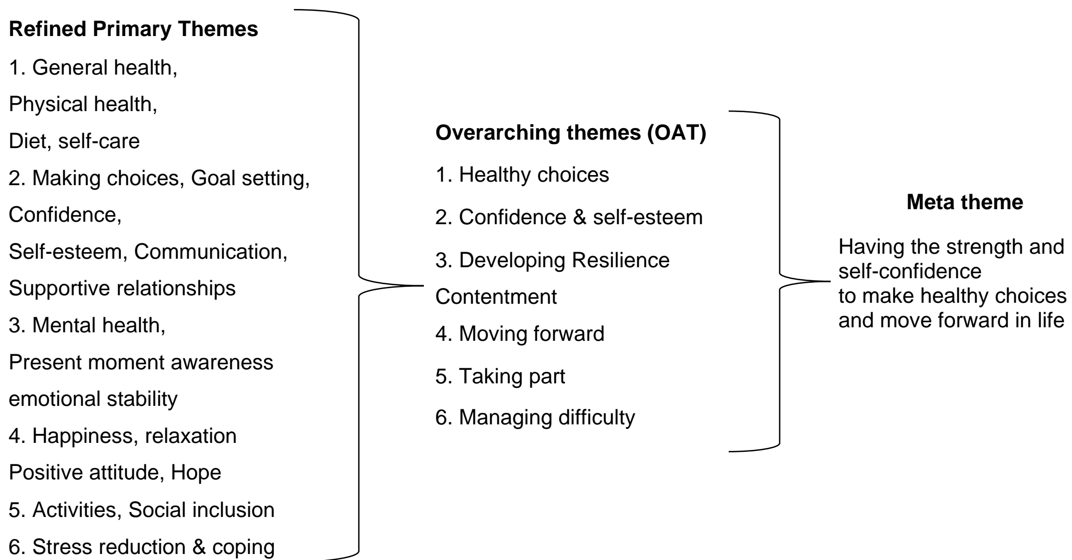


Figure 3b. Outline of Post - training thematic progression.



Although thematic analysis is typically used in qualitative research to examine themes and capture the intricacies of a single data set's meaning (Braun & Clarke, 2006), two data sets were produced here. Thus an additional pairing of each data set's OAT's was considered by the first author to explore if any wellbeing transitions/reperceptions may have occurred over time (see Fig. 4).

Figure 4a. T1 OAT's.

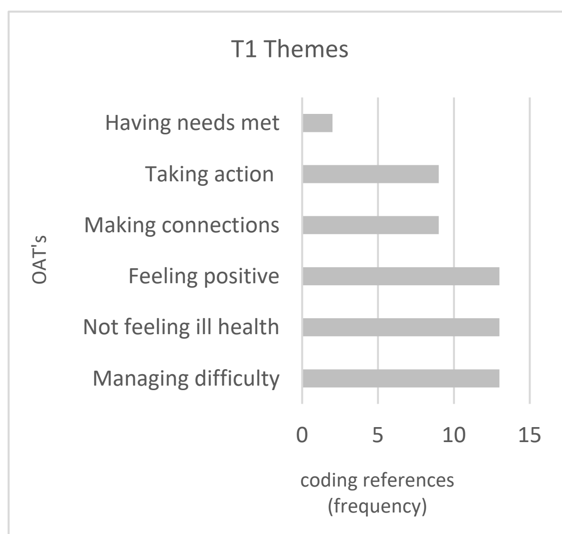
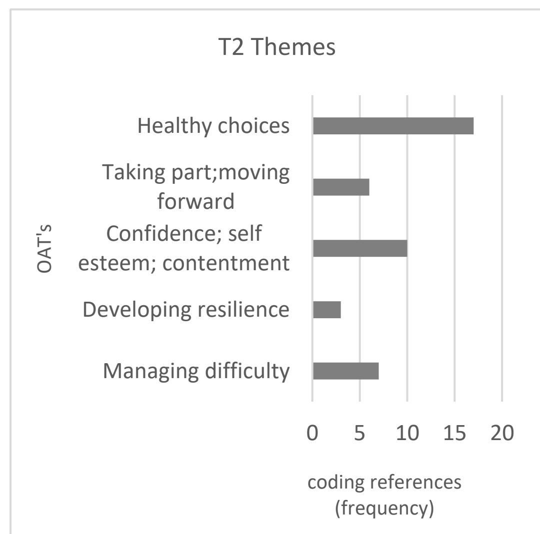


Figure 4b. T2 OAT's.



Observations of Wellbeing Transitions over time.

On examination of OAT's, two themes seemed to permeate both data sets, 'having needs met' and 'managing difficulty'. 'Having needs met' seemed to transition from a need of the resources that could help with "*feeling well, physically as well as mentally"*(6) and "*feeling safe and secure*"(11) according to these PT's at T1, to a need to make use of new found resources. For example, the need to maintain "*health and happiness and I'm working hard on all of these things*"(18), to the discovery that "*being able to trust in self and others means there's nothing to fear*"(24) at T2. 'Managing difficulty', for most, according to T1 PT's, meant dealing with multiple difficulties e.g. "*Being mentally stable"* (22)*, "n*ot feeling ill all the time and requiring medical intervention" (32) and " c*oping with mental health problems and not allowing chronic anxiety to control me"* (36)*.* T2 PT's however, indicated a transition into a more positive "*trusting that you always have options when life is tough*" (31), and an awareness of a need "*to avoid destructive practices"* (11).

Three additional themes also emerged. (I) First, from a sense of feeling excluded, or more precisely, a need of "*being included*" (11) of "*feeling connected to other people*"(19) and of having "*good relationships*"(36) according to PT's at T1. However, T2 PT's indicated that by T2, most, through "*feeling at ease with myself and through that, feeling at ease with others*" (6) discovered a newfound ability to be "*confident around people*"(69). For some this transformed into a wider aspiration to "*succeed in the world and bring the benefits back to myself and my family*" (32) (ii) Second, a focus on general un-wellbeing and associated effects

of poverty emerged in the PT's at T1, among them a wish to have "*no stress or depression*" (18) and of being "*pain free*"(11). By T2 however, PT's indicated a transition into feeling a sense of ease and flexibility through "*balance and mental and physical health*" (10) and a recognition that through applying the training "*a resilience to mental and physical health develops*" (24). (iii) Third, at T1, it was generally felt that there was a need to take action. This ranged from recognising a need to be free from a poverty induced psychological entrenchment through "*becoming emotionally independent*" (32), to a need to be "*getting out in the community and doing things*" (19). By T2 however, these had transitioned into having both the ability and confidence to act. For example, by not allowing "*chronic anxiety to control me*" (36) or letting "*resentment and bitterness into your life*" (11) and maintaining wellbeing by "*being mindful and looking after myself, taking time to myself*" (57) as a result of having "the confidence to do the things I want to do" (61).

Finally, condensing the content of pre and post OAT's seemed to point to a single meta-theme at each time point. At T1, this emerged as a need of 'having the necessary resources to manage difficulty, illness and health', and at T2 of 'having the strength and confidence to make healthy choices and move forward in life'. When paired, these meta-themes, as with OAT's, seem to support an overarching principle of transition.

Discussion

This study aimed to evaluate the feasibility of delivering an adapted Mindfulness-based interventions (MBI) for groups of socioeconomically deprived (SED) adults in a regeneration area and to determine if this would significantly improve their well-being and mindfulness levels. The delivery of the adapted MBI was feasible and the dropout rate (58%) was similar to previous studies with this population. The quantitative analyses revealed significant improvements in well-being in all three measures of this construct with large effect sizes. However, no significant changes in mindfulness were found. The qualitative component suggested subjective shifts in well-being and mindfulness for the training group. Accordingly, the findings of this study indicate that holding an MBI in an area of deprivation/regeneration for SED adults is feasible and can improve participants' well-being.

The robust improvements in well-being of participants in our study are consistent with findings in most previous studies with SED populations (e.g., Hick & Furlotte, 2010; Roth & Creaser, 1997). Although Carmody and Baer (2009) advise caution as additional variables other than mindfulness as such may be at play in well-being improvements after MBIs. The significant effect sizes found suggests that participation in an MBI can improve well-being even though the underlying mechanisms remain unclear. Indeed, we did not find any indicators of improvements in mindfulness as measured by Mindfulness Attention and Awareness Scale (MAAS). This is contrary to findings with the same measure in healthy (Brown and Ryan 2003; Van Dam et al. 2010) and clinical samples (Carlson and Brown 2005; McCracken et al. 2007) and related theory (Black et al. 2012; Van Dam et al. 2010). This could possibly be due to factors such as

problems with the construct validity of the MAAS (Brown et al. 2015; Van Dam et al. 2010), indeed there is debate regarding the extent to which self-reports can sensitively and accurately detect changes in mindfulness after training (Grossman et al., 2011).

The qualitative findings, were based on thematic analysis of written answers to an open well-being-related query at two time points. It seemed that the emergent themes at the pre-test were mostly focusing on negative aspects of physical and mental well-being and an ability to cope, while post-training themes were more positively worded with focus on changes to mindfulness skills, physical and mental well-being and confidence. This more positive outlook reflected in participants' responses was also linked to references about increased self-care in terms of better diet and exercise and reduced self-destructive behaviours. There also seemed to be indicators of increased social skills that better relationships. Pre and post OATs formed the basis for defining transitional pathways in the perceptual change of well-being over time. Two OATs permeated this evolutionary process, 'having needs met' and 'managing difficulty'. 'Having needs met' seems to indicate a transitioning from a sense of hopelessness and feeling of, or being resource-less, to feeling more hopeful, positive and, having better coping skills. The second transitioned from perceiving poverty as unworkable and unmanageable, to reperceiving it as workable and manageable. Three secondary pathways also emerged, transitioning from (i) exclusion to inclusion, (ii) from an overall sense of un-well-being to contentment and resilience, and finally, (iii) from feeling a need to take action, to having the ability to take action. To paraphrase in meta-themes, this meant transitioning from 'having a need for the necessary resources to manage difficulty and

illness/health' to, 'having the strength and self-confidence to make healthy choices and move forward in life'.

It is possible that through gradually decentering from their thoughts, emotions, and body sensations as they arose, and learning to simply be with them, instead of being defined by them (Hick and Furlotte, 2010) enabled the participants to overcome, at least to some extent, their perceived cognitive limitations (Mani et al. 2013). As a result they experienced increased well-being and awareness. To fully investigate this possible mechanism of action, measures of decentering (e.g., Fresco et al., 2007) need to be included in future research with SED populations. However, initial research on mechanisms of mindfulness in clinical conditions, particularly in anxiety which is symptomatic of reduced well-being, points to the pivotal role of decentering in mediating the effects of MBIs (Hoge et al. 2015).

Implications of the findings

As already shown, previous studies with SED populations indicate that mindfulness training may lead to improvements in well-being and mindfulness. As no significant difference was found in the 3 well-being measures between the control and training groups at baseline and a significant increase was noted post-training, this study, likewise, suggests that MBI training can enhance well-being. In addition, the findings for the researcher-designed *mental* and *general well-being* queries echo these findings and replicate the structure of Diener's (2008) 2-part subjective well-being (SWB) construct. This implies validity of the well-being construct measures in this study. The MAAS results, however, suggest that the 15-item version might be too complicated for SED adults. This indicates that

the 6-item version, which has similar psychometric properties as the 15-item version (Van Dam et al. 2010) may have been more appropriate since it reduces respondent burden (Black et al. 2012).

The qualitative analysis, however, implied that the acquisition of mindfulness skills may have supported participants in developing positive coping skills and may have helped them to move from ‘day to day’ reactive decision making, to longer term responsive planning. This might enable better management of the toxic stress of living with chronic low income and possibly help those living in conditions of SED break the perpetuating cycle of suffering associated with it. Furthermore, employing this type of intervention could reduce the present cost of poverty to the nation (Bramley et al. 2016), as evidenced by reported reductions in the use of medications, even after long term use/dependency, and of reduced clinic visits due to feeling better health. Consequently, burdens on already overstretched health services could be reduced. Yet others were coping better with their mental problems, be it bi-polar, depression, OCD, anxieties and phobias, hence the burden on mental health and associated services could possibly be lessened. Others spoke of healed relationships, coping better with family, children and social workers etc., accordingly the burden on social services, family and education services could also be reduced. These results indicate that community-based MBIs are not only feasible and possibly effective, but could become a useful and beneficial part of government well-being policies that may eventually permeate the mainstream (Mindfulness All-party Parliamentary Group, 2015).

Limitations and future directions

The attrition rate in the current study was high despite financial reparations, efficient recruitment protocols and adaptations to the MBSR training. We have collected reasons for participant dropout rates and most of them seemed to be out of their control (see Table 2), with family, carer issues and scheduling conflicts being the most frequent. Perhaps a greater flexibility in the timing of training (several options) and further qualitative research into the support needs of SED participants could provide additional insights into how to reduce barriers to their participation.

Furthermore, only a small set of self-report measures were used in the current study with primary focus on assessing well-being of participants. This was partially due to a concern about participant overload impacting negatively on the dropout rates. As a result, the findings do not allow for investigation of underlying mechanisms of change. However, converging significant findings with large effect sizes from three different measures of well-being support the validity of the overarching results. Future studies could include additional short assessments, such as those evaluating the construct of decentering which seemed to be prominent in qualitative feedback from participants. Inclusion of neurocognitive and psychophysiological measures could also provide new insights into the bio-behavioural changes resulting from MBI training in this population, however, such assessments are more time-consuming and may further increase dropout rates. In addition, this study did not assess ethnicity. which should be included in future studies in order to provide a more complete picture of the impact MBIs can have on SED populations in general.

Finally, the study did not include follow-up assessments, so it is not clear to what extent the initial findings will be sustained long-term and can have longer lasting impact of participants' lives. Nonetheless, this study, as it stands, adds to the extant literature, provides a platform for future research/development and evidences that community-based MBI's are viable.

Conclusion

The current study shows that delivery of adapted MBSR courses to SED adults is feasible and can enhance their well-being. Even though the study had a small sample, the robust improvements on three different measures of well-being are encouraging. These findings are further supported by a shift towards positive comments from participants regarding their well-being from pre-test to post-test. However, the study also reported relatively high levels of participant drop out and no significant change in a measure of mindfulness was found. Further, larger scale studies with more diverse participant samples, a range of measures and follow up assessments are needed. Overall, the findings of this study suggest that MBIs could play an important role in increasing the well-being of adults living under conditions of SED.

Ethics Disclaimer

Ethics Committee in the School of Psychology at Bangor University granted ethical and governance approval for the study and informed consent was obtained from all participants prior to their inclusion in the study. Permission was granted to hold the study in a Dundee City Council integrated health and welfare facility, with full disabled access, facilities, security and logistical support by a Communities Officer.

DISCLOSURES

No conflicts of interest regarding the material presented in this paper, financial or otherwise, are declared by the authors.

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