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Abstract

Due to its potential to concurrently improve work-related wellbeing (WRW) and job performance, occupational stakeholders are becoming increasingly interested in the applications of meditation. The present study conducted the first randomized controlled trial to assess the effects of meditation on outcomes relating to both WRW and job performance. Office-based middle-hierarchy managers (n = 152) received an eight-week meditation intervention (Meditation Awareness Training; MAT) or an active control intervention. MAT participants demonstrated significant and sustainable improvements (with strong effect sizes) over control-group participants in levels of work-related stress, job satisfaction, psychological distress, and employer-rated job performance. There are a number of novel implications: (i) meditation can effectuate a perceptual shift in how employees experience their work and psychological environment and may thus constitute a cost-effective WRW intervention, (ii) meditation-based (i.e., present-moment-focussed) working styles may be more effective than goal-based (i.e., future-orientated) working styles, and (iii) meditation may reduce the separation made by employees between their own interests and those of the organizations they work for.

Key Words: Work-related stress, Meditation, Job Satisfaction, Job Performance, Meditation Awareness Training, Mindfulness, Buddhism

Meditation Awareness Training (MAT) for work-related wellbeing and job performance: A randomised controlled trial

Introduction

Work-related stress (WRS) accounts for 40% of all work-related illness (Health and Safety Executive [HSE], 2012) and approximately 20% of British adults are stressed as a result of their work (Houdmont, Cox, & Griffiths, 2011). Between mid-2011 and mid-2012, 10.4 million working days were lost in Great Britain due to WRS (HSE, 2012), which in conjunction with other work-related mental health issues, costs the British economy up to £26 billion per year (Sainsbury Centre, 2007). Comparatively higher figures are reported for America where 69% of employees report that work is a significant source of stress and 41% of employees typically feel stressed out during the workday (American Psychological Association, 2009). WRS has serious detrimental health and socioeconomic consequences including psychopathology, somatic illness, work-related injury, mortality, reduced productivity, absenteeism, presenteeism, high staff turn-over, unsafe driving, and employee compensation claims (Cox & Griffiths, 2010; Manocha, Black, Sarris, & Stough, 2011; Wu**,** Fox**,** Stokes, & Adam, 2012; Van Gordon, Shonin, Zangeneh, & Griffiths, 2014a).

Interventions that can be empirically shown to reduce WRS – especially those with the potential to concurrently improve employee levels of work performance – are of particular interest to occupational stakeholders (e.g., employees, employers, occupational physicians and psychologists, human resource specialists, trade unions, regulatory bodies, shareholders, etc.). One such interventional technique currently of interest to occupational stakeholders in this respect is that of meditation (Allen & Kiburz, 2012; Dane, 2010; Ho, 2011; Malarkey, Jarjoura, & Klatt, 2013; Monocha et al., 2011; Van Gordon et al., 2014a). The recent growth of interest into the utility of meditation within occupational settings is

likely to have been influenced by the ongoing roll-out and operationalisation of meditation-based interventions (MBIs) by allied healthcare disciplines. Indeed, MBIs have been shown to be effective in treating a broad range of psychological disorders and somatic illnesses including mood disorders, anxiety disorders, substance use disorders, behavioural addictions, eating disorders, sleep disorders, chronic pain, fibromyalgia, irritable bowel syndrome, and cancer (Arias, Steinberg, Banga, & Trestman, 2006; Chiesa & Seretti, 2011; Hofmann, Sawyer, Witt, & Oh, 2010; Shonin, Van Gordon, & Griffiths, 2013a; Singh et al., 2008a). Furthermore, certain MBIs are now advocated by both the National Institute for Health and Clinical Excellence (NICE) and the American Psychiatric Association (APA) for the treatment of specific forms of depression in adults (APA, 2010; NICE, 2009). In addition to applications within clinical and sub-clinical populations, MBIs have also been shown to facilitate significant improvements in cognitive function and task performance in healthy adults (see review by Chiesa, Calati, & Serretti, 2011).

Within both clinical and occupational contexts, the meditation modalities that have received the greatest empirical attention are those that derive from the Buddhist tradition (Singh, Lancioni, Wahler, Winton, & Singh, 2008). Within Buddhism, meditation is construed as a spiritual and introspective practice that involves elements of both concentration and analysis as part of a process of becoming aware of and of training the mind (Dalai Lama, 2001). A primary objective of Buddhist meditation is to effect reductions in selfish behaviour and related attachment to the ego and the 'I' (Dalai Lama, 2001). According to Shonin, Van Gordon, and Griffiths (2013b), meditation effectuates a greater perceptual distance from cognitive and affective processes, and this 'transcognitive' awareness facilitates the regulation of habitual maladaptive and/or aptitude-limiting responses. Although numerous modalities of Buddhist meditation (e.g., mindfulness meditation, loving-kindness meditation, compassion meditation, and insight meditation) have been developed into

intervention formats, such interventions are generally presented in a secular arrangement in order to make them more palatable within non-religious (i.e., clinical, organisational, educational, etc.) settings (Shonin, Van Gordon, & Griffiths, 2014).

Notwithstanding the on-going assimilation of MBIs by mainstream healthcare operators, and notwithstanding the growth of interest within occupational psychology into the work-related applications of meditation, there is a scarcity of methodologically robust research focussing on the health benefits of MBIs for the working population (Monocha et al., 2011). Research evaluating the effects of meditation on work performance is likewise underdeveloped (Dane, 2011). In fact, to the authors' knowledge, a controlled and large sample-sized (i.e., $n > 100$) efficacy study investigating the effects of meditation on outcomes relating to both wellbeing at work (e.g., WRS) and job performance has yet to be undertaken.

The objective of the present study was to undertake an empirical investigation to evaluate the effect of a secular Buddhist-derived MBI known as Meditation Awareness Training (MAT; Van Gordon, Shonin, Sumich, Sundin, & Griffiths, 2014b) on work-related wellbeing and job performance in full-time employees. Office-based middle-hierarchy managers were the focus of the current study for a number of reasons: (i) middle managers are considered to be particularly at-risk for WRS due to striving to access hierarchically-higher lifestyles, with success in this respect being heavily dependent upon the results and performance of their lower-ranking team members (McConville & Holden, 1999), (ii) middle managers are exposed to both upwards and downwards management demands and frequently find themselves acting as a 'buffer' between top-level decision-makers and non-management employees (McConville & Holden, 1999; Peter & Siegrist, 1997), (iii) a single intervention study (whether controlled or uncontrolled) focussing on the effects of meditation on this specific worker population has never before been undertaken, and (iv) the methodological

preference to maximise sample homogeneity with regards to job roles, demands, and salaries. It was hypothesised that compared to a non-meditating control group, office-based full-time employed middle managers that received MAT would demonstrate significant improvements in both work-wellbeing and job performance outcomes, and that these gains from the MBI would be maintained at three-month follow-up.

Method

Design

A randomised controlled trial (RCT) compared MAT with an active control condition. Consolidated Standards of Reporting Trials (CONSORT; Boutron, Altman, Schulz, & Ravaud, 2008; Schulz, Altman, & Moher, 2010) guidelines for non-pharmacological interventions were followed where applicable. The study was approved by the University Ethics Committee of the research team.

Participants

Male and female full-time office-based employees with middle management responsibility were randomly allocated to either MAT or the control condition. Participants were recruited via: (i) press releases (and subsequent newspaper articles), (ii) posters and flyers located at strategic sites in three cities in the East Midlands (UK), (iii) the client database of local meditation practice centres (limited to individuals who had expressed an interest in receiving meditation training but had not yet done so), and (iv) presentations by some of the research team to personnel of key local employers. Participation was completely voluntary and individuals were not rewarded for their involvement in the study (although all participants received a certificate upon completion of the training). As an ethical consideration and to aid recruitment, participants allocated to the control condition were prioritised for acceptance

onto a subsequent delivery of MAT scheduled to take place immediately after the last assessment phase.

Eligibility Criteria

The inclusion criteria for participation in the study were as follows: (i) in full-time employment (> 30 hours per week), (ii) not currently absent from work (e.g., due to leave of absence, maternity leave, sickness, etc.), (iii) management responsibility for ≥ 1 salaried direct report (excluding secretaries or personal assistants), (iv) reporting to a line manager, (v) annual salary between £40,000 and £65,000 per annum (i.e., a salary range was applied in order to maximise homogeneity in terms of career profile and role demands), (vi) being office-based for at least 50% of working hours, (vii) ≥ 18 years of age, (viii) not currently undergoing formal psychotherapy, (ix) not currently practicing meditation, and (x) no changes in psychopharmacology (type or dosage) one-month prior to intervention (although stable prescription medication was permitted). Participants were excluded from the study if they were: (i) currently diagnosed (based on self-reports) with a psychotic disorder, personality disorder, bipolar disorder, neurological disorder, or substance/alcohol use disorder, or (ii) unable to confirm their availability to complete the eight-week MAT intervention and three-month follow-up assessment.

Randomisation and Blinding

The first author (and trial coordinator) was responsible for recruitment and participant screening. Following the screening process, eligible participants were assigned participant pseudonyms (comprising computer-generated randomly-designated five-digit codes). The document linking participant demographic and screening results to their pseudonyms was stored in a sealed opaque envelope in a lockable unit within the office of the trial coordinator,

and all other researchers were blinded as to its contents. A list of eligible participant pseudonyms, grouped by sex, was then passed to the second author who conducted the randomisation procedure. On a sex-strata basis, participant pseudonyms were placed into a bowl, and then selected one at a time and inserted alternately into two separate envelopes. Randomisation occurred prior to participants completing any baseline assessments, and the trial coordinator was not involved in the randomisation process. Participants were blinded as to allocation condition until after completion of baseline assessments.

Sample Size Calculation

Statistical power calculations (*GPOWER Software*; Faul & Erdinger, 1992) indicated a total sample size of 128 participants (assuming an equal distribution between allocation conditions) would be required for an effect size of 0.5, an alpha of 0.05, and 80% power. Attrition was estimated at 20%, and an over-recruitment margin was applied accordingly. Prior to being shortlisted, all interested participants were required to attend a one-hour meditation taster session to reduce the likelihood of drop-out.

Program Description

Existent mindfulness-based therapies tend to teach mindfulness 'out of context' and in isolation of enabling meditative agents (Shonin et al., 2013c). To overcome this limitation, MAT is an eight-week secular intervention that follows a more traditional and comprehensive approach to meditation. Although mindfulness is an integral component of MAT, it is not the exclusive focus. In addition to mindfulness, MAT incorporates meditation techniques that are specifically intended to engender: (i) citizenship, (ii) perceptive clarity, (iii) ethical and compassionate awareness, (iv) meditative insight (e.g., into subtle concepts such as non-self and impermanence), (v) patience, (vi) generosity (e.g., of one's time and energy), and (vii)

perspective. These practices are taught via seminars and/or workshops and are integrated into a graded-series of guided meditations. Participants attend eight x 90-minute workshops and receive a CD of guided meditations to facilitate daily self-practice. Weekly sessions comprise three distinct phases: (i) a taught/presentation component (approximately 35 minutes), (ii) a facilitated group-discussion component (approximately 25 minutes), and (iii) a guided meditation and/or mindfulness exercise (approximately 20 minutes). A short break (5-10 minutes) is always scheduled immediately prior to the guided meditation.

On a four-weekly basis, each participant is invited to attend a one-to-one support session (of 50-minute duration) with the program facilitator. The support sessions provide an opportunity to discuss individual progress or problems with the meditation training. Rather than prescribe participants with a fixed set of answers, the facilitator's role in the one-to-one sessions is more one of aiding a process of 'guided discovery' (Wells, 1997). Consistent with a traditional (Buddhist) approach to meditation instruction, the objective during the one-to-one sessions is to elicit a co-produced form of insight that can be shared by facilitator and participant alike (Van Gordon et al., 2013). Thus, although the one-to-one dialogues are not explicitly designed as psychotherapy sessions *per se*, they inevitably exert a therapeutic effect and inherently integrate many of the conditions employed during contemporary psychotherapeutic modes (e.g., conditions of active listening, unconditional positive regard, accurate empathy, genuineness, and congruence; Wells 1997).

In addition to the one-to-one sessions, a further unique attribute of MAT is that participants are not assigned a specified amount of daily meditation practice time. Rather, participants are encouraged to adopt a dynamic meditation routine and are guided on an individual basis to find the optimum frequency and duration of meditation sessions. According to Van Gordon et al (2014b), this avoids divisions being formed between

meditation during formal sitting settings and practising meditation (or mindfulness) whilst engaging in tasks and activities. In other words, participants are less likely to become dependent on a fixed routine of formal seated meditation sessions and are thus able to conduct their practice in a manner that is adaptive to the demands of contemporary work and living environments. Attendance at at-least seven of the eight weekly sessions is a prerequisite for course completion. Prior to receiving MAT, all participants are asked to confirm they understand and agree to the level of commitment required. In the current trial, MAT was delivered by the second author (ten years psychotherapy and meditation teaching experience) and the first author (thirty years psychotherapy and meditation teaching experience) provided supervision in order to assess any deviations from the standard intervention format.

Control Condition

The control condition was a group program involving educating participants in cognitive-behavioural theory and principles. The program was devised with reference to guidelines by MacCoon et al (2012) for the development of suitable control groups for specific forms of meditation-based interventions. The control condition was identical to the intervention condition on all non-specific factors such as overall course length, individual session duration, group and one-to-one discussion component, and inclusion of an at-home practice element. Weekly sessions comprised: (i) a taught presentation component (35 minutes), (ii) a facilitated group discussion component (25 minutes), and (iii) guided discovery educational exercises (20 minutes). The sessions were explicitly education-focussed and did not include any form of meditative practice or discussion of meditation theory. To control for a facilitator effect and ensure consistency of didactic style, the control group sessions were also delivered by the second author. To assess any differences in the facilitator's levels of enthusiasm

between groups, participants in both the intervention and control groups were asked to rate (on a 1 to 5 Likert scale) the facilitator's levels of planning and motivation.

Outcome Measures

Psychometric tests were administered and scored by an independent analyst and comprised the following:

HSE Management Standards Work-Related Stress Indicator Tool (WSIT [HSE, n.d.]): The WSIT is a 35-item measure of WRS and assesses the following seven work-stress domains: (i) demands (e.g., workload and work patterns), (ii) control (e.g., level of work autonomy), (iii) managerial support (e.g., employer-derived encouragement and support), (iv) peer support (e.g., peer-derived encouragement and support), (v) relationships (e.g., promotion of positive working), (vi) role (e.g., clarity of the employees role), and (vii) change (e.g., how organisational change is managed and communicated). The WSIT is typically utilised by organisations as an indicator of employee psychosocial working conditions. However, given the WSIT assesses multiple sources of stress at work and is completed by the employee, it was administered in the current study as an indicator of self-perceived stress at work (see *Discussion* section for additional rationale and the implications of using the WSIT). The WSIT uses a five-point Likert scale (1 = never, 5 = always) and higher scores reflect lower levels of WRS. The WSIT has excellent levels of reliability (internal reliability α = .92) and validity. A confirmatory factor analysis by Edwards, Webster, Van Laar, and Easton (2008) (n = 26,382 participants across 39 organisations) demonstrated that the instrument has a hierarchical factor structure in which seven first-order factors (i.e., the seven work-stress domains) each test distinct dimensions of work-stress, whilst a single second-order factor confirms that each subscale also taps aspects of the same underlying work-stress construct

(Edwards et al., 2008). The combined score of each work-stress domain provides a global indication of WRS.

Abridged Job in General Scale (AJIGS [Russel et al., 2004]): The AJIGS is an eight-item measure of global job satisfaction and forms part of the Job Description Index. The scale contains the following adjectives or short phrases: *"makes me content", "better than most", "good", "disagreeable", "excellent", "enjoyable", "poor",* and *"undesirable"*. For each item, respondents are asked if they agree ("yes"), aren't sure ("?"), or disagree ("no"). A score of 3 is assigned for "yes", 1 for "?", and 0 for "no". Individual items are summed to give a total score and negatively-worded items are reverse-scored. Higher scores indicate greater levels of job satisfaction. The scale has excellent internal reliability consistency (α = .85) and construct validity (Russel et al., 2004).

Depression, Anxiety, and Stress Scale (DASS [Lovibond & Lovibond, 1995]): The DASS measures emotional distress and comprises three sub-scales: (i) depression, (ii) anxiety, and (iii) stress. The scale is scored on a four-point Likert scale (from: 0 = "*Did not apply to me at all"*, to 3 = *"Applied to me very much or most of the time"*) and features items such as *"I found it hard to wind down"* and *"I felt that life was meaningless"*. The DASS is completed in respect of the foregoing seven-day period. Scores for each of the three sub-scales can be summed together to provide an overall measure of psychological distress (Van Gordon et al., 2013). The internal consistency for the overall scale is .93 and the scale shows strong levels of test-retest reliability for non-clinical populations (Henry & Crawford, 2005). The 21-item (as opposed to the longer 42-item version) was administered because factor analysis yields a superior latent structure for the short-form measure (Henry & Crawford, 2005). A good balance between sensitivity and specificity has likewise been demonstrated (Gloster et al., 2008). According to the DASS manual (Lovibond & Lovibond, 1995), the percentile cut-offs

(and corresponding mean scores) for symptom severity are as follows: 0-78 ($M \leq 13$) = Normal, 78-87 (M = 14-18) = Mild, 87-95 (M = 19-28) = Moderate, and > 95 ($M \geq 28$ = Severe).

Role-Based Performance Scale (RBPS [Welbourne, Johnson, & Erez, 1998]): The RBPS is a 20-item measure of general work performance. The RBPS is based on role theory and identity theory, and adopts a multidimensional approach to work performance. The RBPS assesses performance across five different work roles: (i) job (e.g., quantity and quality of work output, standard of internal and external customer service), (ii) career (e.g., skill development, personal career goal attainment), (iii) innovator (e.g., improving processes and routines, generating and implementing new ideas), (iv) team member (responding to others' needs in his/her work group, ensuring his/her work group succeeds), and (v) organisational citizen (e.g., working for the overall benefit of the company). Scoring is on a Likert scale (1 = needs much improvement, 5 = excellent) and each role typology contains four items. When summed together, scores for each role typology provide an overall indication of job performance. The RBPS was completed by participants' direct line manager and submitted directly to the research team. The scale has excellent reliability (α = .86 - .96) and discriminant validity.

Data Analysis

A significance level of $p<0.05$ and two-tailed tests were employed throughout. Independent samples *t*-tests (for continuous variables) and chi-square tests with Yates's correction (for categorical variables) were used to identify any significant differences between groups in demographic characteristics or baseline dependant variable mean scores. Visual inspection of frequency histograms confirmed a Gaussian distribution and so differences between allocation conditions at end-point and three-month follow-up were assessed using Analysis of

Variance (ANOVA) with a 2 x 3 design (i.e., a group factor [intervention, control] and a time factor [baseline, endpoint, three-month follow-up]). Significant multivariate effects were followed by univariate analysis of each outcome variable. Effect sizes (Cohen's *d*) were estimated based on difference scores (baseline to follow-up) of each dependent variable, and showed the size of the between groups effect (absolute value) using a mean averaged standard deviation. The trial was conducted on an 'intent-to-treat' basis with missing data at end-point substituted on a last-observation-carried-forward (LOCF) basis.

Results

Recruitment and Allocation

A total of 215 individuals completed the screening questionnaire and 63 of these individuals were screened-out on the grounds of ineligibility. The main reasons for exclusion were: (i) not in full-time employment (17 individuals), (ii) annual salary below the acceptance threshold (14 individuals), and (iii) currently receiving structured psychotherapy (12 individuals). Of the 152 remaining participants, 76 were allocated to the intervention group and the same number to the control group (see Figure 1). MAT and the control group interventions were each delivered in three separate tranches (i.e. approximately 25 participants per tranche).

<Insert Figure 1 about here>

Attrition, Attendance, and Fidelity of Implementation

There were no significant attrition differences between allocation conditions. Eight MAT participants (5 females, 3 males) and eleven control-group participants (6 females, 5 males) dropped out of the study prior to completing the intervention. The main reasons for non-completion were: (i) changing job (4 participants), (ii) *"not for me"* (4 participants), (iii) vacation (3 participants), (iv) *"too busy"* (3 participants), and (v) sickness (2 participants). The response-rate for RBPS questionnaires completed by participants' line managers was approximately 90%. All participants that received MAT or the control intervention attended at least seven of the eight weekly sessions. MAT participants practiced meditation for an average of 44.47 (SD = 14.96) minutes per day (number of meditation sessions per day: M = 1.61 [SD = 0.51]). There were no significant differences between groups in participant ratings of the facilitator's levels of planning and motivation.

Demographic and Baseline Characteristics

Demographic information is presented separately for each allocation condition (see Table 1). There were no significant differences between groups in any baseline demographic characteristics (i.e., age, sex, level of education, salary, number of employees). Likewise, there were no significant differences between groups in baseline mean scores on the WSIT, AJIGS, and DASS. However, there was a significant difference between intervention group (M = 73.71, SD = 6.10) and control group (M = 77.71, SD = 6.95) in baseline mean scores on the RBPS (t (130) = 3.57, $p < .001$).

<Insert Table 1 about here>

Analysis of Outcome Measures

Owing to violation of the assumption of sphericity, Greenhouse-Geisser correction was reported for all ANOVA analyses. Results showed a significant interaction effect of group (intervention, control) and time (baseline, endpoint, three-month follow-up) for all dependant variables [WSIT ($F(1.3) = 146.21$, $p < 0.001$), AJIGS ($F(1.6) = 141.15$, $p < 0.001$), DASS ($F(1.4) = 179$, $p < 0.001$), RBPS ($F(2) = 238$, $p < 0.001$] (see Table 2 for all *means* and *SD*). Figure 2 shows plotted means with two-tier confidence intervals for each time factor (baseline, endpoint, and three-month follow-up) across groups (intervention and control). A clear and strong effect of MAT was observed for each outcome variable, suggesting that MAT improves levels of WRS, job satisfaction, psychological distress, and job performance more effectively than the control intervention.

<Insert Table 2 about here>

Further analysis using paired-samples *t*-tests was carried out (making adjustment for the family-wise Type I error rate) for both groups (intervention, control) to test for differences between time factors. The results demonstrated significant differences in intervention group dependent variable mean scores for all time factors: baseline vs. endpoint [WSIT ($t(75) = -16.49$, $p < 0.001$, $d = -1.89$), AJIGS ($t(75) = -16.39$, $p < 0.001$, $d = -1.88$), DASS ($t(75) = 17.65$, $p < 0.001$, $d = 2.02$), RBPS ($t(67) = -19.13$, $p < 0.001$, $d = -2.32$)], baseline vs. follow-up [WSIT ($t(75) = -14.60$, $p < 0.001$, $d = -1.67$), AJIGS ($t(75) = -14.29$, $p < 0.001$, $d = -1.64$), DASS ($t(75) = 17.37$, $p < 0.001$, $d = 1.99$), RBPS ($t(66) = -18.11$, $p < 0.001$, $d = -2.21$)], endpoint vs. follow-up [WSIT ($t(75) = -2.70$, $p < 0.001$, $d = -.30$), AJIGS

($t(75) = -2.44$, $p < 0.001$, $d = -.28$), DASS ($t(75) = 3.10$, $p < 0.01$, $d = 0.35$), RBPS ($t(66) = -3.54$, $p < 0.001$, $d = -0.43$)]. Combining these differences suggests the effect of MAT was sustained across all time factors.

Results from *t*-test comparisons of time factors for the control group demonstrated significant baseline vs. endpoint differences for all outcome variables [WSIT ($t(70) = -7.70$, $p < 0.05$, $d = -.84$), AJIGS ($t(75) = -7.24$, $p < 0.05$, $d = -.82$), DASS ($t(75) = 7.35$, $p < 0.001$, $d = 0.84$), RBPS ($t(66) = -3.85$, $p < 0.001$, $d = -0.47$)]. Significant endpoint vs. follow-up differences were observed for the WSIT ($t(73) = 5.90$, $p < 0.001$, $d = 0.69$), AJIGS ($t(75) = 6.37$, $p < 0.001$, $d = 0.74$), and DASS ($t(75) = 2.18$, $p < 0.05$, $d = 0.25$), but not for the RBPS ($t(66) = 1.74$, $p = 0.86$). Differences between baseline and follow-up were significant for the DASS ($t(75) = -5.39$, $p < 0.001$, $d = 0.59$) and RBPS ($t(66) = -3.69$, $p < 0.001$, $d = -0.45$), but not for the WSIT ($t(71) = 1.26$, $p = 0.21$) or the AJIGS ($t(75) = -0.50$, $p = 0.61$).

The pattern of effect outlined above suggests that the control intervention had an initial positive impact on levels of WRS, job satisfaction, psychological distress, and job performance. This effect was sustained through to follow-up in the case of job performance and psychological distress, but regressed back to baseline levels for WRS and job satisfaction. However, although the control intervention appears to have a significant positive effect on psychological distress (i.e., DASS) that was sustained at follow-up, it should be noted that the direction of the means differences is tending towards baseline levels (see Figure 2). This was supported by inspection of effect sizes that showed a decrease from an effect of large magnitude (baseline vs. endpoint) to one of small magnitude (baseline vs. follow-up).

Finally, interaction effects were further examined by comparing time factors (baseline, endpoint, and follow-up) across each group (intervention, control). Owing to the

fact that baseline differences have been tested for methodological control (see section '*Baseline and demographic statistics'*), only endpoint and follow-up comparisons are reported here. The results of *t*-test comparisons between groups (intervention, control) showed significant differences at endpoint [WSIT ($t(146) = 10.65$, $p < 0.001$, $d = 1.78$), AJIGS ($t(150) = 10.65$, $p < 0.001$, $d = 1.64$), DASS ($t(150) = -13.33$, $p < 0.001$, $d = 2.16$), RBPS ($t(133) = 8.22$, $p < 0.001$, $d = 1.42$)] and follow-up [WSIT ($t(149) = 12.67$, $p < 0.001$, $d = 2.06$), AJIGS ($t(150) = 13.86$, $p < 0.001$, $d = 2.25$), DASS ($t(150) = 14.96$, $p < 0.001$, $d = 2.43$), RBPS ($t(132) = 9.10$, $p < 0.001$, $d = 1.56$)]. Although the mean baseline RBPS score for the control group was greater than that of the intervention group (see section '*Baseline and demographic analysis*'), it should be noted that at endpoint and follow-up, RBPS values were significantly greater in the intervention group. This suggests a superior effect for the MAT intervention that supersedes any effect due to unexpected and spurious between-group differences in baseline RBPS values.

<Insert Figure 2 about here>

Discussion

A randomised control trial was conducted to assess the effectiveness of MAT for improving work-related wellbeing and job performance. A reasonably homogeneous sample of full-time employed middle-hierarchy office-based managers were allocated to receive MAT or an active control intervention. Outcomes were in the hypothesised direction with meditating participants demonstrating significant improvements (with strong effect sizes) compared to controls on levels of WRS, job satisfaction, psychological distress, and employer-rated job

performance. These interventional gains were maintained (and slightly augmented) at three-month follow-up.

Given that the study was the first of its kind, it is impractical to draw specific comparisons with other studies. However, outcomes are broadly consistent with findings from the following studies of meditation in occupational contexts: (i) a cross-sectional study by Ho (2011) that found employee meditation experience was positively associated with self-directed learning, organisational innovativeness, and organisational performance in Taiwanese technological company workers, (ii) a cross-sectional study of employed (i.e., >20 hours per week) parents by Allen and Kiburz (2012) that found trait mindfulness was positively associated with work-life balance, sleep quality, and vitality, (iii) an intervention study by Monocha et al (2011) that found following meditation training, full-time employees (of unspecified work backgrounds but with ~50% not educated beyond secondary school level) demonstrated significant reductions over control-group participants in levels of stress and depression-dejection, (iv) an intervention study by Malarkey et al (2013) that found university employees that practiced mindfulness meditation showed significant increases compared to controls in levels of mindfulness (but not in other psychometric-based indicators of psychological distress or in levels of stress biomarkers such as cortisol or interleukin-6), and (v) various studies of individuals employed in caregiver roles (e.g., primary care physicians) that have related receipt of meditation training to reductions in burnout and improvements in client-centred and empathic care (e.g., Krasner et al., 2009).

Outcomes from the present study were also consistent with the sizeable body of findings from clinical studies indicating a role for meditation in the general reduction of psychological distress (e.g., see reviews by Arias et al., 2006; Chiesa & Seretti, 2011; Hofmann et al., 2010). The observed effect of MAT on employer-rated job performance also

accords well with studies demonstrating that meditation can improve cognitive ability (see review by Chiesa et al., 2011), other-cooperation and interpersonal skills (see review by Shonin, Van Gordon, Slade, & Griffiths, 2013), and task performance (see review by Dane, 2011).

Data from the WSIT indicated that MAT helped to reduce participant levels of WRS. The WSIT, along with the majority of established work-stress measures, is essentially based on an 'exposure environmental' model of work stress (Van Gordon et al., 2014a). In such a model, the WRS construct is intended to reflect the extent to which employees are exposed to sub-optimal working conditions. Examples of such conditions might be (i) low work autonomy, (ii) inflexible working hours, (iii) conflicting demands, (iv) overly-taxing or impractical deadlines, and (v) inadequate support infrastructure. This operational model of work-stress is process-orientated and emphasises the importance of the employee's 'external' work environment over and above their 'internal' psychological environment (Van Gordon et al., 2014a). This is a different conceptual stance than that employed by a meditational model of work-stress. From the meditator's perspective, rather than exact changes to the external work environment, the most efficacious method of reducing stress (and psychological distress more generally) is to modify the 'internal' (i.e., psychological) working environment (Van Gordon et al., 2014a).

As further elucidated below, by inducing a perceptual-shift in the mode of responding and relating to sensory and cognitive-affective stimuli, meditating employees are better able to objectify their cognitive processes and to apprehend them as passing phenomena (Van Gordon et al., 2014a). In the traditional meditation literature, this manner of transferring the locus of control for stress from external conditions to internal metacognitive and attentional

resources is analogised as the difference between covering the entire outdoors with leather, versus simply adorning the feet with a leather sole (see Santideva, 1997).

The current intervention was delivered to middle managers recruited from the general population and did not involve any organisational-level changes to work conditions (e.g., innovative appraisal and reward systems, flexible work schemes, etc.). Therefore, the fact that meditating participants demonstrated statistically significant improvements on a work-conditions-based measure of WRS (i.e., the WSIT) is particularly meaningful, and has potentially important implications that may prompt occupational stakeholders to think differently about how work-stress reduction initiatives are devised and implemented. Indeed, these findings imply that an effective work-wellbeing intervention might be one that does not entail extensive ('externally orientated') changes to human resource management systems and practises.

Consistent with the well-documented association between stress and cognitive performance (Eysenck, 2004; Fox & Georgiou, 2005), the mechanisms of action underlying the improvements in participant levels of both work-related wellbeing and job performance are likely to be closely related. As part of receiving MAT, participants were trained in two different but complementary meditative modes. Concentrative meditation techniques (also known as tranquil abiding; Sanskrit: *shamatha*) were taught to help moderate extraneous cognitive activity and to focus the mind on present moment experience. Concentrative meditation techniques typically involve the use of an attentional referent – such as observance of the breath – to aid present moment attentiveness (Nhat Hanh, 1999). Breath observance, that is a core component of the MAT syllabus, has been shown to reduce autonomic (e.g., heart rate) and psychological arousal via increases in prefrontal functioning and Vagal nerve output (Gillespie et al., 2012). Thus, the primary goals of concentrative

meditation are those of psychosomatic calming, mind-body synchronisation, and enhanced metacognitive awareness.

It is important to note that the use of breath observance in interventions such as MAT does not prevent other experiences entering into the attentional field (Van Gordon et al., 2014a). In other words, breath awareness is used to help anchor concentration on the present moment, and this concentration is most accurately described as being broad rather than a narrow in aspect (Dane, 2010; Singh et al., 2008b). Therefore, this form of meditative absorption allows employees to attend with due attention to whatever task they are engaged in, but without becoming so immersed or lost in that task that their situational and cognitive-affective awareness is compromised (Van Gordon et al., 2014a). This is consistent with the observed improvements in employer-rated job performance which suggest that although meditating participants were engaging more present-moment-focused (i.e., as opposed to future orientated goal-focussed) working styles, this (presumably) did not impair goal attainment.

The second meditative mode utilised in MAT is that of insight meditation (also known as analytical meditation). Concentrative meditation helps to calm maladaptive emotional states and their related thought processes, but concentrative meditation alone does not tackle such emotions at their routes (Shonin et al., 2014). Utilising the tranquillity cultivated during concentrative meditation as a platform, insight meditation techniques are a means of undermining the determinants of such negative affective states (Rabjam, 2002). According to 'ontological addiction theory' (a means of operationalising a meditative model of mental illness), the root cause of all distorted thoughts and feelings is an "*unwillingness to relinquish an erroneous and deep-rooted belief in an inherently existing 'self' or 'I' as well as the 'impaired functionality' that arises from such a belief*" (Shonin et al., 2013a, p.64). Via

techniques that intuit a level of realisation into the impermanent, interdependent, and 'empty' nature of the self, insight meditation is basically designed to dismantle the ego entity that constantly tries to reify its own existence (Dalai Lama, 2001).

The above (necessarily succinct) elucidation of several meditative (and in particular Buddhist philosophical) principles has been necessary to provide a contextual basis for the findings of this study, and to explicate how these findings have a number of important and potentially novel implications within occupational contexts. According to meditation theory relating to psychosocial functioning, incentive to perform is essentially ego-driven and derives from a desire for recognition, career advancement, and monetary reward (Shonin et al., 2013a). Indeed, a significant proportion of employees that adopt a policy of organisational citizenship behaviour (OCB) do so primarily because they deem it to be written in their job description (known as 'in role' OCB), or because somewhere along the line, there is a possibility that they will be recognised and duly rewarded for their efforts (Morrison, 1994). However, when such recognition or benefits are not forthcoming, employees can feel undervalued and overlooked, and negative cognitive schemas inevitably ensue (Kanfer, Chen, & Pritchard, 2008). Thus, via the meditation-induced understanding that there is not a self that exists inherently, independently, or as a permanent entity, employees can begin to dismantle their emphasis on the 'I', the 'me', and the 'mine', and can better synchronise their own interests with those of the organisations (Nhat Hanh, 1999; Shonin et al., 2014).

By restricting the amount of 'I' involved in work activities and encounters, employees are more able to attend with 'non-dual attention' to the task at hand (Trungpa, 2003). This permits the boundary and divide between subject and object, between organisation and self, and between problem and solution to become more permeable, and facilitates the meditation-

practising employee to engender an increasingly panoramic perspective (Nhat Hanh, 1999). In this open and selfless ground state, what is known in the Buddhist literature as 'superior seeing' (Sanskrit: *vipashana*) can arise. Superior seeing, consistent with its traditional construal, implies a greater aptitude in areas such as strategic planning and decision-making, the identification and appraisal of risks and opportunities, intuiting and understanding the needs of internal and external customers, and general capacity for managing and leading others.

The other added advantage of limiting the amount of 'I' allocated to work participation is that without the ego as their referent, maladaptive cognitive and affective states are without the nourishment they need to survive. Accordingly, 'non-attachment to self' has been shown to predict greater levels of mindfulness, acceptance, non-reactivity (e.g., to environmental/work stressors), self-compassion, positive outlook, subjective wellbeing, and eudemonic wellbeing (Sahdra, Shaver, & Brown, 2010). Furthermore, recent quantitative and qualitative meditation studies have shown that interventions employing insight meditation techniques effectuate improvements in: (i) levels of stress, anxiety, and depression, (ii) positive affect, (iii) present moment and task attentiveness, (iv) perspective, (v) satisfaction with decisions made, (vi) personal agency, (vii) sense of purpose, (viii) emotion-focussed coping strategies, and (ix) interpersonal skills (e.g., Shonin et al., 2013c; Van Gordon et al., 2013).

Thus, findings from the present study indicate that whilst exploiting different mechanistic pathways, concentrative meditation and insight meditation techniques each appear to have utility for augmenting both work-related wellbeing and job performance. In the case of concentrative meditation, these improvements relate to a reduction of psychological and autonomic arousal as well as an increased ability to focus on the task at

hand whilst not losing situational awareness. Insight meditative techniques complement concentrative techniques by questioning and undermining the validity of the 'I' construct, and this in-turn makes work engagement more about task performance rather than the self.

Although findings from the current study indicate a number of applications for MAT in organisational settings, several factors may limit their external validity. By providing pre-intervention taster-sessions, the sample most likely comprised only those employees with an active interest in learning to meditate. Therefore, findings may not generalise to workers with an indifferent or negative attitude towards meditation practice. Consistent with the following observations, the sample comprised relatively highly motivated middle-hierarchy managers aspiring towards higher-hierarchy lifestyles and career roles: (i) the low attrition rate, (ii) a relatively high earnings to age ratio (i.e., mean age = 40 years, annual salary range = £40,000 - £65,000), (iii) strong adherence to self-practice meditation routines (i.e., MAT participants practiced meditation for an average of 44 minutes per day), and (iv) feedback from the intervention facilitator. Consequently, further research is required in order to replicate these findings in worker populations fitting different occupational profiles (e.g., semi-skilled workers, skilled workers, etc.). A further potentially limiting factor was the fact that baseline mean scores on the DASS corresponded to the upper segment of the normal severity rating. Therefore, it is possible that the sample comprised a reasonably high number of 'treatment-seeking' participants. Accordingly, workers who enrol on MAT for exclusively non-health-related reasons (e.g., continued professional development) may demonstrate dissimilar outcomes. Finally, although the study included a three-month follow-up assessment, a longer-term assessment (e.g., six or twelve months) would of course have provided a better indication of MAT's longer-term impact.

Findings from the current study appeared to rebut several established systems of thought within occupational psychology regarding the determinants and mechanisms of action that underlie effective work-related wellbeing and job-performance-enhancing interventions. Firstly, organisational strategies for improving job performance tend to be heavily goal-based, which is primarily a forward-looking (i.e., future-orientated) approach. Outcomes from this study indicate that not only does job performance remain unimpaired by present-moment-focussed (i.e., mindfulness-based) working styles, but it is actually enhanced by them. Secondly, an effective intervention for improving employee levels of work-wellbeing and job satisfaction might be one that focusses on facilitating a perceptual shift in how employees relate to and experience their work and psychological environment. This is in contrast to the current trend where organisational-level work-wellbeing interventions tend to be geared towards implementing 'externally-based' modifications to human resource management systems and practices. Finally, by reducing the amount of ego allocated to work tasks and interpersonal interactions (i.e., with team members, internal and external customers, top-level management, etc.), employees may be better able to nurture clearer, more insight-based, and strategically-focussed working styles, and to work in a manner that reduces the separation between their own interests and those of the organisations they work for. It is concluded that MAT appears to be an effective intervention for improving both work-related wellbeing and job performance in middle-hierarchy office-based managers. Future studies could perhaps use random sampling as part of an intra-organisational design in order to ascertain whether these findings are replicable for employees meeting different occupational profiles, and for employees who do not necessary have an active interest in learning to meditate.

References

American Psychological Association. (2009). *Stress in America 2009*. Retrieved from http://www.apa.org/news/press/releases/stress/

American Psychiatric Association. (2010). *American Psychiatric Association practice guideline for the treatment of patients with major depressive disorder* (3rd ed.). Arlington, VA: American Psychiatric Publishing.

Allen, T. D., & Kiburz, K. M. (2012). Trait mindfulness and work-family balance among working parents: The mediating effects of vitality and sleep quality. *Journal of Vocational Behaviour, 80,* 372-379.

Arias, A. J., Steinberg, K., Banga, A., & Trestman, R. L. (2006). Systematic review of the efficacy of meditation techniques as treatments for medical illness. *Journal of Alternative and Complementary Medicine, 12,* 817-832.

Boutron, I., Altman, D. G., Schulz, K. F., & Ravaud, P. (2008). Extending the CONSORT statement to randomized trials of nonpharmacologic treatment: Explanation and elaboration. *Annals of Internal Medicine, 148,* 295-309.

Chiesa, A., & Serretti, A. (2011). Mindfulness based cognitive therapy for psychiatric disorders: A systematic review and meta-analysis. *Psychiatry Research, 187,* 441-453.

Chiesa, A., Calati, R., & Serretti, A. (2011). Does mindfulness training improve cognitive abilities? A systematic review of neuropsychological findings. *Clinical Psychology Review, 31,* 449-464.

Cox, T., & Griffiths, A. (2010). *Work-related stress: A theoretical perspective*. In: Leka, S. and Houdmont, J., (Eds.). *A textbook of occupational health psychology*: 31-56. Oxford: Wiley-Blackwell.

Dalai Lama. (2001). *Stages of meditation: Training the mind for wisdom.* London: Rider.

Dane, E. (2010). Paying attention to mindfulness and its effects on task performance in the workplace. *Journal of Management, 37,* 997-1018.

Edwards, J. A., Webster, S., Van Laar, D., & Easton, S. (2008). Psychometric analysis of the UK Health and Safety Executive's Management Standards work-related stress Indicator Tool. In: British Academy of Management Annual Conference, 10-12 Sep 2008, Harrogate, UK.

Eysenck, M. W. 2004. *Trait anxiety, repressors and cognitive biases*. In J. Yiend (Ed.), *Cognition, emotion and psychopathology: Theoretical, empirical and clinical drections:* 49-67. Cambridge, England: Cambridge University Press.

Fox, E., & Georgiou, G. A. (2005). *The nature of attentional bias in human anxiety*. In R. W. Engle, G. Sedek, U. von Hecker, & D. N. McIntosh (Eds.), *Cognitive limitations in aging and psychopathology*: 249-274. Cambridge, England: Cambridge University Press.

Faul. F., & Erdinger, E. (1992). *GPOWER: A priori, post-hoc, and compromise power analysis for MS-DOS*. Bonn University.

Gillespie, S. M., Mitchell, I. J., Fisher, D., & Beech, A. R. (2012). Treating disturbed emotional regulation in sexual offenders: The potential applications of mindful self-regulation and controlled breathing techniques. *Aggression and Violent Behavior, 17,* 333-343.

Health and Safety Executive. n.d. *HSE Management Standards Work-Related Stress Indicator Tool*. London: Author.

Health and Safety Executive. (2012). *Stress and psychological disorders*. Available from: http://www.hse.gov.uk/statistics/causdis/stress/index.htm. (Accessed 4th August 2013).

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the depression anxiety stress scales (DASS-21): construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 44,* 227-239.

Ho, L. (2011). Meditation, learning, organisational innovation and performance. *Industrial Management and Data Systems, 111,* 113-131.

Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 78,* 169-183.

Houdmont, J. Cox, T., & Griffiths, A. (2011). Work-related stress case definitions and prevalence rates in national surveys. *Occupational Medicine, 60,* 658-661.

Kanfer, R., Chen, G., & Pritchard, R.D. (2008). *Work motivation: Forging new perspectives and directions in the post-millenium*. In Kanfer, R., Chen, G., & Pritchard, R.D. (Eds), *Work motivation: past, present and future*: 601-632. New York: Tailor and Francis.

Krasner, M. S., Epstein, R. M., Beckman, H., Suchman, A. L., Chapman, B., Mooney, C.J., & Quill, T. E. (2009). Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *Journal of the American Medical Association, 302,* 1284-1293.

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales.* Sydney: Psychology Foundation.

MacCoon, D. G., Imel, Z. E., Rosenkranz, M. A., Sheftel, J. G., Weng, H. Y., Sullivan, J. C., … Lutz, A. 2012. The validation of an active control intervention for Mindfulness Based Stress Reduction (MBSR). *Behaviour Research and Therapy, 50,* 3-12.

Malarkey, W. B., Jarjoura, D., & Klatt, M. (2013). Workplace based mindfulness practice and inflammation: A randomized trial. *Brain, Behaviour and Immunity, 27,* 145-154.

Manocha, R., Black, D., Sarris, J., & Stough, C. (2011). A randomised controlled trial of meditation for work stress, anxiety and depressed mood in full-time workers. *Evidence-Based Complementary and Alternative Medicine*, doi:10.1155/2011/960583.

McConville, T., & Holden, L. (1999). The filling in the sandwich: HRM and middle managers in the health sector. *Personnel Review, 28,* 406-424.

Morrison, E. W. (1994). Role definitions and organizational citizenship behavior: The importance of the employee's perspective. *Academy of Management Journal, 37,* 1543-1567.

National Institute for Health and Clinical Excellence (NICE). (2009). *Depression: Management of depression in primary and secondary care.* London: Author.

Nhat Hanh, T. (1992). *The sun my heart.* London: Rider.

Nhat Hanh, T. (1999). *The heart of the Buddha's teaching: Transforming suffering into peace, joy and liberation*. New York: Broadway Books.

Peter, R., & Siegrist, J. (1997). Chronic work stress, sickness absence, and hypertension in middle managers: General or specific sociological explanations? *Social Science and Medicine*, *45,* 111-1120.

Rabjam, L. (2002). *The practice of Dzogchen.* (H. Talbot, Ed., & Tulku Thondup, Trans.) New York: Snow Lion Publications.

Russel, S. S., Spitzmuller, C., Lin, L. F., Stanton, J. M., Smith, P. C., & Ironson, G. H. (2004). Shorter can also be better: The abridged Job in General Scale. *Educational and Psychological Measurement, 64,* 878-893.

Sahdra, B. K., Shaver, P. R., & Brown, K. W. (2010). A scale to measure non-attachment: A Buddhist complement to Western research on attachment and adaptive functioning. *Journal of Personality Assessment, 92*, 116-127.

Sainsbury Centre for Mental Health. (2007). *Mental health at work: Developing the business case*. London: Author.

Santideva. (1997). *A guide to the Bodhisattva way of life.* (V. A. Wallace, & A. B. Wallace, Trans.) New York: Snow Lion Publications.

Schulz, K. F., Altman, D. G., & Moher, D. (2010). CONSORT 2010 statement: Updated guidelines for reporting parallel group randomized trials. *Annals of Internal Medicine, 152,* 1-8.

Singh, N. N., Lancioni, G. E., Singh, A. N., Winton, A. S. W., Singh, J., McAleavey, K. M., … Joy, S. D. S. (2008a). A mindfulness-based health wellness program for managing morbid obesity. *Clinical Case Studies, 7,* 327-339.

Singh, N. N., Lancioni, G. E., Wahler, R. G., Winton, A. S., & Singh, J. (2008b). Mindfulness approaches in cognitive behavior therapy. *Behavioral and Cognitive Psychotherapy, 36,* 1-8.

Shonin, E., Van Gordon, W., & Griffiths, M. D. (2013a). Buddhist philosophy for the treatment of problem gambling. *Journal of Behavioral Addictions, 2,* 63-71.

Shonin, E., Van Gordon, W., & Griffiths, M. D. (2013b). Mindfulness-based interventions: Towards mindful clinical integration. *Frontiers in Psychology, 4,* 194, doi: 10.3389/fpsyg.2013.00194.

Shonin, E., Van Gordon, W., & Griffiths, M. D. (2013c.) Meditation Awareness Training (MAT) for improved psychological wellbeing: A qualitative examination of participant experiences. *Journal of Religion and Health, 53*, 849-863.

Shonin, E., Van Gordon, W., Slade, K., & Griffiths, M. D. (2013). Mindfulness and other Buddhist-derived interventions in correctional settings: A systematic review. *Aggression and Violent Behavior*, *18,* 365-372.

Shonin, E., Van Gordon W., & Griffiths, M. D. (2014). The emerging role of Buddhism in clinical psychology: Toward effective integration. *Psychology of Religion and Spirituality, 6,* 123-137.

Sogyal Rinpoche. (1998). *The Tibetan book of living and dying*. London: Rider.

Trungpa, C. (2003). *The collected works of Chogyam Trungpa: Volume four*. Boston: Shambala.

Van Gordon, W., Shonin, E., Zangeneh, M., & Griffiths, M. D. (2014a). Work-related mental health and job performance: Can mindfulness help? *International Journal of Mental Health and Addiction*, *12*, 129-137

Van Gordon, W., Shonin, E., Sumich, A., Sundin, E., & Griffiths, M. D. (2014b). Meditation Awareness Training (MAT) for psychological wellbeing in a sub-clinical sample of university students: A controlled pilot study. *Mindfulness*, *5*, 381-391.

Welbourne, T. M., Johnson, D. E., & Erez, A. (1998). The Role-Based Performance Scale: Validity analysis of a theory-based measure. *Academy of Management Journal, 41,* 540-555.

Wu, T., Fox, D., Stokes, C., & Adam, C. (2012). Work-related stress and intention to quit in newly graduated nurses. *Nurse Education Today, 32,* 669-74.

Table 1. Means and standard deviations of outcome variable scores for group and time

		WSIT		AJIGS		DASS		RBPS	
	Group	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Baseline	Intervention	88.46	28.54	12.93	3.55	10.61	3.15	73.66	6.10
	Control	89.00	20.07	13.50	2.60	10.76	2.27	77.72	6.95
Endpoint	Intervention	136.09	23.94	19.46	3.32	4.13	2.86	88.10	6.31
	Control	97.70	19.29	14.62	2.53	9.47	2.00	79.00	6.70
Follow-up	Intervention	139.36	26.96	20.21	3.21	3.72	3.00	89.19	6.96
	Control	90.76	20.09	13.59	2.64	10.41	2.48	78.55	6.64

Table 2. Baseline demographic characteristics for each allocation condition

Characteristic	MAT (*n* = 76)	Active Control (*n* = 76)
Age, mean (*SD*)	40.14 (8.11)	39.91 (8.67)
Female (%)	56.9	56.9
Graduated from University (%)	88.2	85.6
No. of Employees, mean (*SD*)	7.34 (6.64)	6.49 (4.80)
Annual salary (%)		
£40,000-50,000	63.1	59.2
£50,000-65,000	36.9	40.8
Marital Status (%)		
Married	56.6	59.2
Single	26.3	29.0
Divorced	14.5	10.5
Widow	2.6	1.3
Ethnicity (%)		
White (British)	49.9	53.9
White (Non-British)	14.5	15.8
Asian	14.5	11.8
Indian	7.9	7.9
Black (African)	5.3	5.3
Black (Caribbean)	5.3	5.3
Other	2.6	0

Figure 1. Trial profile according to the revised CONSORT statement.

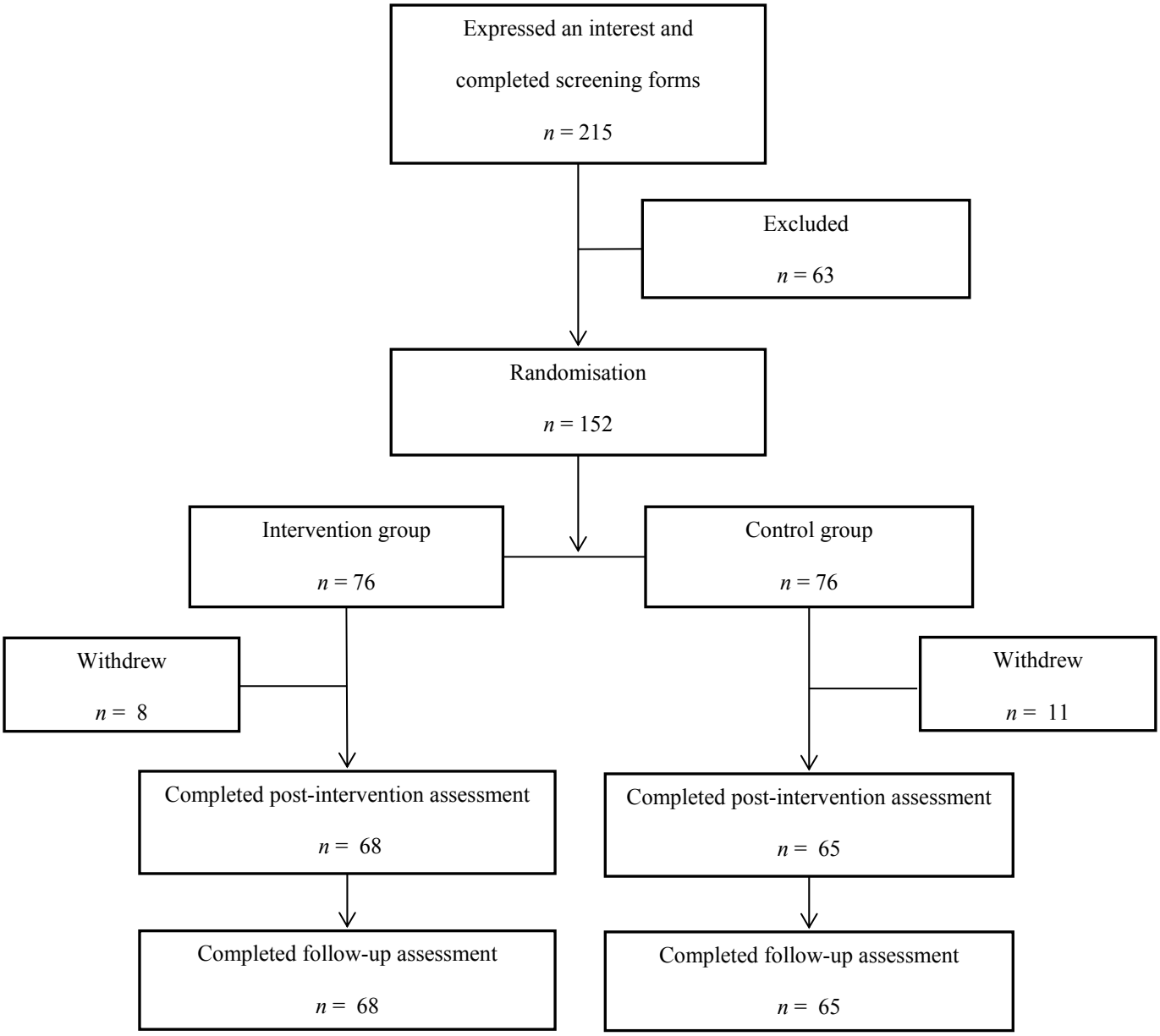
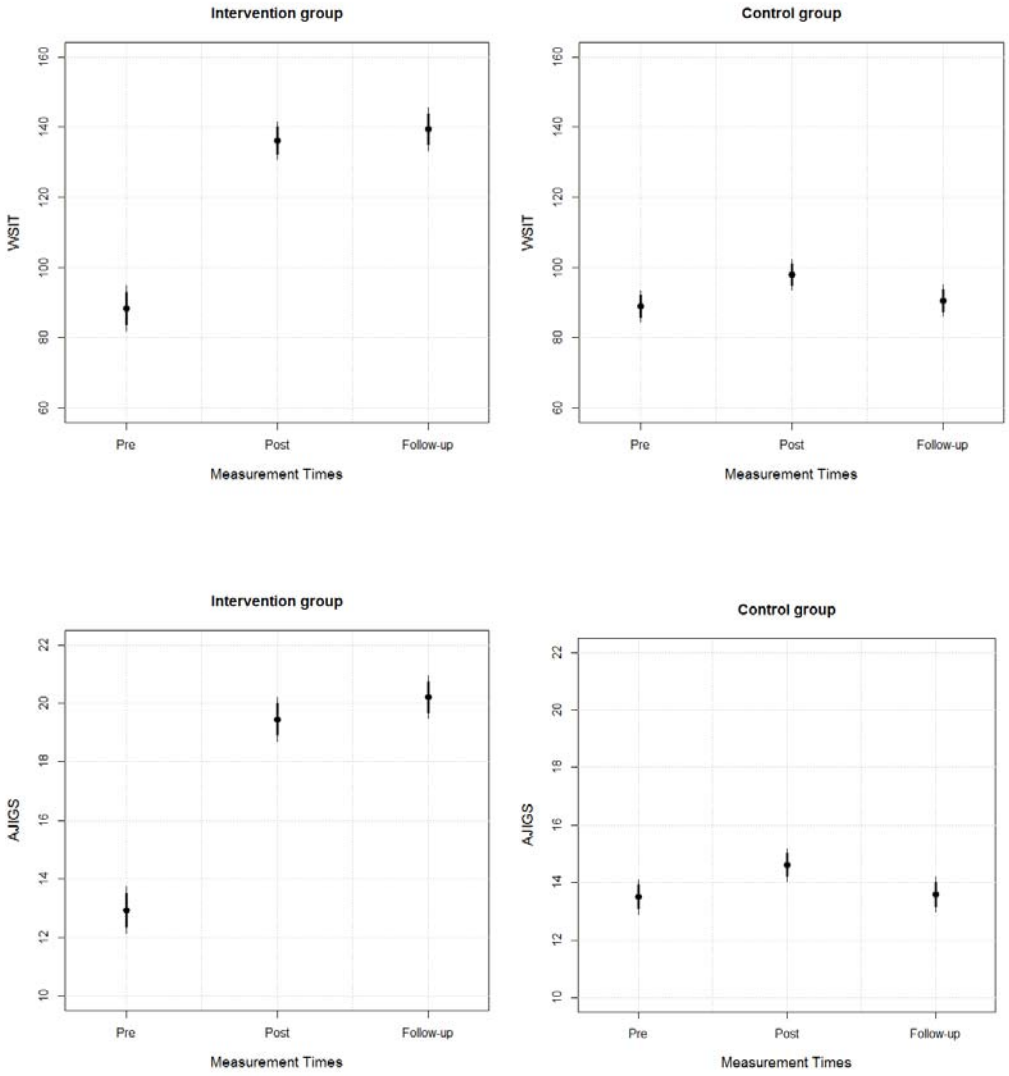
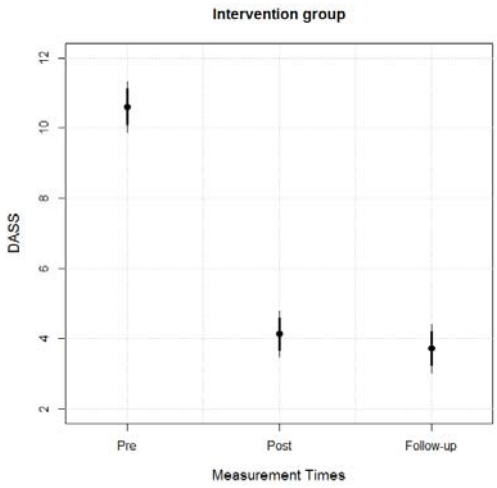


Figure 2. Interaction plots with two-tier confidence intervals showing the impact of time factor (baseline, endpoint, and three-month follow-up) on dependent variables across groups (intervention, control).

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Pre
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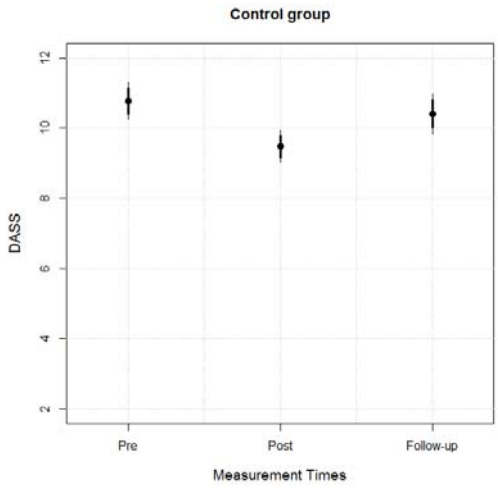
Follow-up
Measurement Times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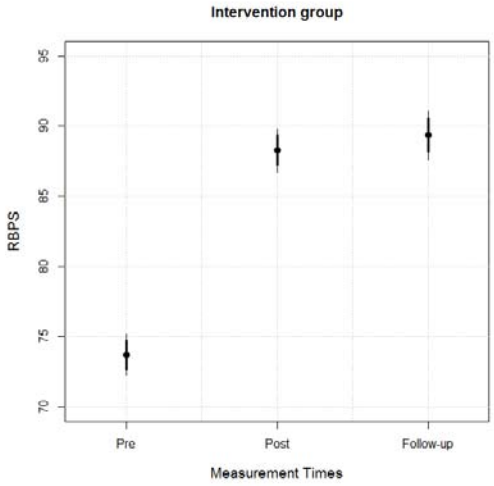
Intervention group
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Pre
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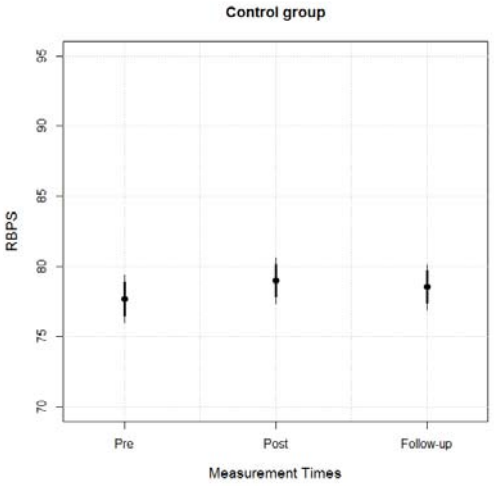
Follow-up
Measurement Times


Control group
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