

Full title

A cluster randomized controlled trial to evaluate *HeadCoach*: an online mental health training program for workplace managers

Running Heading

HeadCoach online mental health training for managers.

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Ethics approval and consent to participate This study received ethical approval from the South Eastern Sydney Local Health District Human Research Ethics Committee HREC ref. no: 16/348 (HREC/16/POWH/684). It has been registered with the Australian New Zealand Clinical Trials Registry: ACTRN12617000279325 prior to the commencement of participant recruitment.

Authors' contributions AG, SBH, NG, AMi, AMy, ADL, MD and RAC contributed to the design of the study. AG, SBH and AMa conducted the analyses. AG and SBH prepared the first draft of the manuscript. All authors approved the final manuscript for submission.

Conflicts of Interests AG, ADL, NG and SBH co-own the intellectual property for *HeadCoach*. HC, AMa and SBH are employed by the Black Dog Institute who provide manager training to workplaces.

Objective Mental ill-health is now the leading cause of sickness absence and occupational incapacity in high-income countries. This study evaluated *HeadCoach* online manager training, designed to improve confidence and managerial behaviours that create mentally healthy workplaces.

Methods A cluster randomized controlled trial was conducted comparing managers who received *HeadCoach* (N=87) to waitlist control (N=123). Managers' confidence and behaviour were investigated at baseline, post-intervention and follow-up. Psychological distress of direct reports was evaluated.

Results Confidence significantly increased post-intervention only, however per-protocol analyses indicated a significant improvement for program completers compared to control at both time points. Responsive and preventive behaviours significantly improved. Psychological distress of direct reports remained unchanged.

Conclusions *HeadCoach* online mental health training is an effective and scalable way to improve managers' confidence and workplace practices around mental health. The impact on direct reports remains unknown.

Keywords manager, supervisor training, workplace mental health, mental health education, online intervention, randomized controlled trial, behaviour, eHealth

Over recent decades, occupational impairment due to psychiatric conditions has steadily increased (1), with mental health conditions now becoming the leading cause of long term sickness absence and work incapacity in most high-income countries (2-4). Mental health conditions seen in the workplace, such as depression, anxiety and stress-related disorders, may often be precipitated by characteristics of the workplace (5). This relationship is now acknowledged as a major public health concern (6).

Managers play a key role in the well-being of staff they supervise through the application of appropriate preventive and responsive managerial strategies (7, 8). Their knowledge of workplace issues, and ability to implement changes to working conditions for staff, place managers in an influential position to minimise or prevent the impact of work-related mental health risk factors. Additional preventive strategies include modelling accepting attitudes towards mental ill-health and supporting the mental health needs of staff (9, 10). The corollary of this is that managers who behave in an inappropriate or bullying manner can contribute to the development of mental health problems (11, 12). The way managers respond to staff experiencing mental ill-health can also impact the recovery process for workers (7, 8), with evidence suggesting a positive association between manager contact and the recovery and return to work of employees reporting directly to them (7, 13).

Despite the importance of their role, many managers report uncertainty about how to best support mental health needs of their staff (10, 14). This has led to the development of a range of mental health training programs specifically for managers. A recent systematic review and meta-analysis found such training can improve managers' mental health knowledge, reduce stigmatising attitudes towards mental illness, and increase implementation of supportive managerial behaviours (15). To date, manager mental health training programs have principally focused on face-to-face training. Although potentially effective (16), such training may be expensive and logistically difficult to deliver, especially if regular booster sessions

are needed. Online training has the benefits of standardised delivery combined with the flexibility to tailor content to target audience, and be scheduled around users' job demands (17), with the opportunity to revisit content within the learning environment to enhance the consolidation of course material.

Considering these factors, and following recently recommended best practice frameworks for workplace mental health initiatives (9, 18), we developed an online training intervention for managers called *HeadCoach*. *HeadCoach* is the first mental health program for managers delivered entirely online offering a suite of both responsive and preventive strategies that offers a suite of both responsive and preventive strategies to help managers better understand and support the mental health needs of their staff. This randomized controlled trial (RCT) was conducted to test the effectiveness of *HeadCoach* to improve managers' confidence in implementing evidence-based responsive and preventive managerial techniques to create a mentally healthy workplace.

Methods/Design

Study Design and participants

A cluster RCT was conducted in partnership with three organizations. Two organizations were state-specific ambulance services across Australia. The third was an Australia-wide building equipment hire company. The study protocol, including selection of the primary outcome and detailed analysis plan, was published prior to the study being completed (19). (HREC ref.no.16/348-HREC/16/POWH/684).

Randomisation

Within each organization, clusters of managers were defined by pre-existing geographical work zones comprising offices or stations at which managers and the staff they supervised

were based. An independent researcher based at the University of New South Wales used a computer-generated program to conduct the stratified randomisation of workplace clusters within each of the three organizations.

Inclusion criteria

All participants at the manager and direct report employee levels were required to be 18 years or older; be residing in Australia; have good English comprehension; and work for one of the collaborating industry partners. In addition, managers were required to be supervising three or more staff members. Direct report employees who met the above criteria were included in the analyses if at least half of the managers from their site had enrolled for the trial.

Trial Procedures

Managers

Following completion of the online baseline questionnaire, managers in the intervention group received immediate access to the online *HeadCoach* manager training program. For managers in both the intervention and control groups, notification of the post questionnaire was emailed at 6-weeks following. If a manager in the intervention group completed all components of the online program earlier within the 6-week training period, they received the post-questionnaire at that time point. At 4-months post baseline, notification regarding the final questionnaire was sent to both groups irrespective of rate of adherence to subsequent stages of the trial. At the completion of this final questionnaire, the control group received access to the *HeadCoach* program. Managers from both groups who completed this questionnaire were entered into a prize draw for one of three vouchers to the value of AUD\$250.

Direct Report Employees

Direct report employees completed the baseline questionnaire in the month prior to any managers commencing the intervention. This questionnaire was the only activity of participation required until the follow-up questionnaire, which was distributed via email 5-months following their baseline to coincide with the managers' 4-month follow-up questionnaire. The email also informed participants of the opportunity at completion to enter a prize draw for one of three AUD\$250 vouchers.

Primary outcome

The primary outcome for this study was a change in managers' self-reported confidence to create a mentally healthy workplace in which the mental health needs of their direct report employees are appropriately supported. This primary outcome was selected *a priori* and specified in our previously published protocol (19). Managers' confidence was assessed at each assessment point using a modified version of a previously published supervisor scale (7). This modified scale has been used in published RCTs of other manager interventions (16) and validated against manager behaviour (20). This scale describes six workplace scenarios which managers are asked to indicate their level of confidence in dealing with on a five-point Likert scale ranging from *not at all* to *extremely confident*, resulting in an overall confidence score ranging from 6 to 30. Scenarios included "Initiating contact with staff on sickness absence leave that you believe might be due to mental illness" and "Creating a work environment that prevents and reduces stress within my team"(21).

Secondary outcomes

Changes in managers' behaviours was measured using an adapted version of the Health and Safety Executive (HSE) Management Standards Indicator Tool (22). This evaluated both

responsive behaviours to staff experiencing mental ill-health and preventive behaviour to reduce mental ill-health risks within the workplace to create a more mentally healthy workplace. Direct report employees were asked about their level of psychological distress using the 6-item Kessler Psychological Distress Scale (K6) (23).

Statistical Analyses

The primary analysis was undertaken within an intent-to-treat framework utilising mixed-model repeated measures (MMRM) (19). Clustering was accommodated by a random cluster membership factor and an unstructured variance-covariance matrix was used to accommodate the relationships between observations at different occasions of measurement. In addition to the group-by-time interaction, differences between the intervention and control groups at each of the follow-up time points were examined against baseline using planned contrasts. *A priori* planned per-protocol analyses were conducted to assess the effectiveness of the program amongst those who completed differing numbers of the online modules compared to the waitlist control group. Prior to undertaking the analysis, raw data was examined for outliers. Where outliers were excluded for the primary analysis, sensitivity analyses for the primary and secondary outcomes were conducted which included the outliers. Analyses were conducted in SPSS version 23.

Role of the Funding Source

This project was developed with funding from *beyondblue* with donations from the Movember Foundation. Additional funding was provided by the icare foundation and the Mental Health Branch of NSW Health, Australia. The funders had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Results

Manager Outcomes

As outlined in Figure 1, a total of 229 managers consented to participate in this study. Of those who completed baseline, follow-up data were available for 41 intervention group managers (47.1%) and 78 control group managers (63.4%). Examination of the response trajectory of each manager participating in the study generated for the primary outcome determined improbable outlier responses supplied by one manager at follow-up. As a result, this participant was excluded. However, sensitivity analysis including responses from this outlier confirmed that the exclusion of this individual did not alter the results reported. Figure 1 details the trial profile and participant retention for managers and their direct reports in both conditions.

Demographic details of the manager sample at baseline are shown in Table 1. There were no differences between intervention and control participants at baseline (all $P > 0.05$).

The intraclass correlation (ICC) for the primary outcome measuring managers' confidence in supporting the mental health needs of their staff was 0.0004. For the primary outcome, there was a significant interaction of condition group and time ($F[2, 121.7] = 4.3$, $P = .015$). Analyses of post-intervention measurements for the primary outcome indicated manager confidence significantly improved over time in the intervention group compared to the control ($P = .004$), although this difference was attenuated at follow-up ($P = .082$) (Figure 2a). These differences equate to Cohen's d effect sizes of 0.44 (95%CI 0.16 to 0.72) and 0.35 (95%CI 0.08 to 0.63) respectively. Figures 2b and 2c displays the pattern of change for the two behavioural outcomes. At post-intervention, a significant difference was detected between the intervention and control groups for responsive behaviour ($P = .012$). This difference remained

significant at follow-up ($P=.036$). Similarly, for preventive behaviour, significant differences between the conditions were found post-intervention ($P=.003$) and follow-up ($P=.026$).

In the intervention group, 32 (36.8%) managers completed all *HeadCoach* modules. As outlined in our published analysis plan (19), per-protocol analyses were also conducted. As shown in Figure 3a, a significant difference was found in the confidence scores between *HeadCoach* completers and the control group ($P=.015$). This effect was not found when comparing partial program completers with the control group ($P=.97$). Figures 3b and 3c show the similar patterns that were observed for both behavioural outcomes.

Direct Report Employee Outcomes

Of the 391 direct report employees who provided baseline data, 173 (44%) responded to the follow-up questionnaire. There were no detectable differences in K6 scores between the two groups over the follow up period ($F[1, 184.65]=0.57$, $P=.57$) with levels of psychological symptoms in both groups remaining stable over time.

Discussion

This cluster RCT is the first to examine the impact of a manager mental health training program that addresses both responsive and preventive strategies and delivered entirely online. Our findings suggest that this program can improve managers' confidence and lead to changes in responsive and preventive behaviour important in creating a mentally healthy working environment for staff. Given the rising costs of mental ill-health amongst workers in most developed countries, these are key findings with major implications. There is a growing consensus that workplaces should be one of the key domains in which public mental health initiatives are focused (24), but to date there have been very few scalable, evidence-based interventions that can be used in workplaces (25). The availability of an evidence-based,

simple on-line training program for managers represents a major step towards the hope of achieving more supportive, mentally healthy workplaces.

The choice of managers' confidence as the primary outcome was driven by recent observational research showing that confidence is the most important predictor of positive manager behaviour regarding mental health in the workplace (20). This was also in keeping with theories suggesting that people are more likely to engage in a particular behaviour when their confidence or self-efficacy to succeed is higher (26). In line with these assumptions, our results showed that as well as improving manager's confidence, *HeadCoach* also led to changes in managers' behaviour. Importantly, these differences in manager behaviour remained apparent at follow-up, supporting the potential of this online manager training to generate sustained changes to the way managers handle mental health issues in the workplace by minimising work-related mental health risk factors, and supporting staff through episodes of mental illness. However, this study was not able to demonstrate that *HeadCoach* produced changes in the mental health and wellbeing of workers reporting to the managers undertaking the additional training. The inability to capture the proposed flow on benefits to staff is similar to previous findings from other studies of manager training (15, 27). In contrast, one previous trial of face-to-face manager training, which had very similar content to *HeadCoach*, was able to detect a change in sickness absence amongst direct reports (16). However, the type of linked sickness absence data used to evaluate face to face training was not available for this trial, so a direct comparison of employee level results is not possible. In addition, there are a number of other potential methodological reasons for the lack of detectable change amongst direct reports. Although follow-up in this study was longer than for many previously published controlled trials, the duration was less than for Milligan-Saville et al's positive study of face-to-face training (16), so may still not have been sufficient to allow improvement in manager behaviours to impact the experiences of direct reports. In

addition, we refrained from asking direct reports to supply the name of their manager in order to maximise response rate, with employee-manager linkage conducted based on worksite location. It became apparent post data collection that this method did not produce a robust means of matching employees to managers, as although it could be identified that the employee was based at the same sites as the managers, it was uncertain if the employee was directly managed by a supervisor participating in the trial. This potential misclassification of direct reports combined with the relatively small sample may have led to type 2 errors. Therefore, it remains uncertain whether online training is able to produce a meaningful change at the level of direct reports similar to that of face-to-face training.

There are a number of other limitations to this study that should be considered. The adherence rate for program completion and follow-up surveys, although not dissimilar to previously published studies on internet interventions (28-30), were low. Personalised email reminders included in this study to enhance participant engagement may have increased response rate somewhat, however future evaluations may consider additional strategies such as text messages, to further promote streamlined progress. A further limitation of this study is the reliance on self-reported measures to evaluate the effectiveness of the program. There is risk of managers reporting their confidence and managerial practices more favourably, however, the anonymity of an online survey should have reduced the likelihood of this occurring. Future research may also find value in evaluating employee sickness absence records and staff turnover data to determine effectiveness of the intervention at the direct report level. It is also important to acknowledge is that this intervention was implemented in isolation to allow the evaluation on the impacts of this strategy alone.

This study is the first to demonstrate the benefits a training program delivered entirely online can have on managers' confidence and behaviour. Given the rising costs of mental ill-health amongst workers in most developed countries, there is an urgent need for evidence-based,

feasable workplace mental health programs. Although there remains value in future examinations of manager training to compare face-to-face and online training to determine the equivalence of delivering content via these different methods, our results suggest that online training programs can offer a practical, efficient and effective means to enhance the way managers support the mental health needs of their employees.

Ethics approval and consent to participate This study has received ethical approval from the South Eastern Sydney Local Health District Human Research Ethics Committee HREC ref. no: 16/348 (HREC/16/POWH/684). It has been registered with the Australian New Zealand Clinical Trials Registry: ACTRN12617000279325 prior to the commencement of participant recruitment.

ACCEPTED

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Figure Legend

Figure 1: CONSORT Trial profile

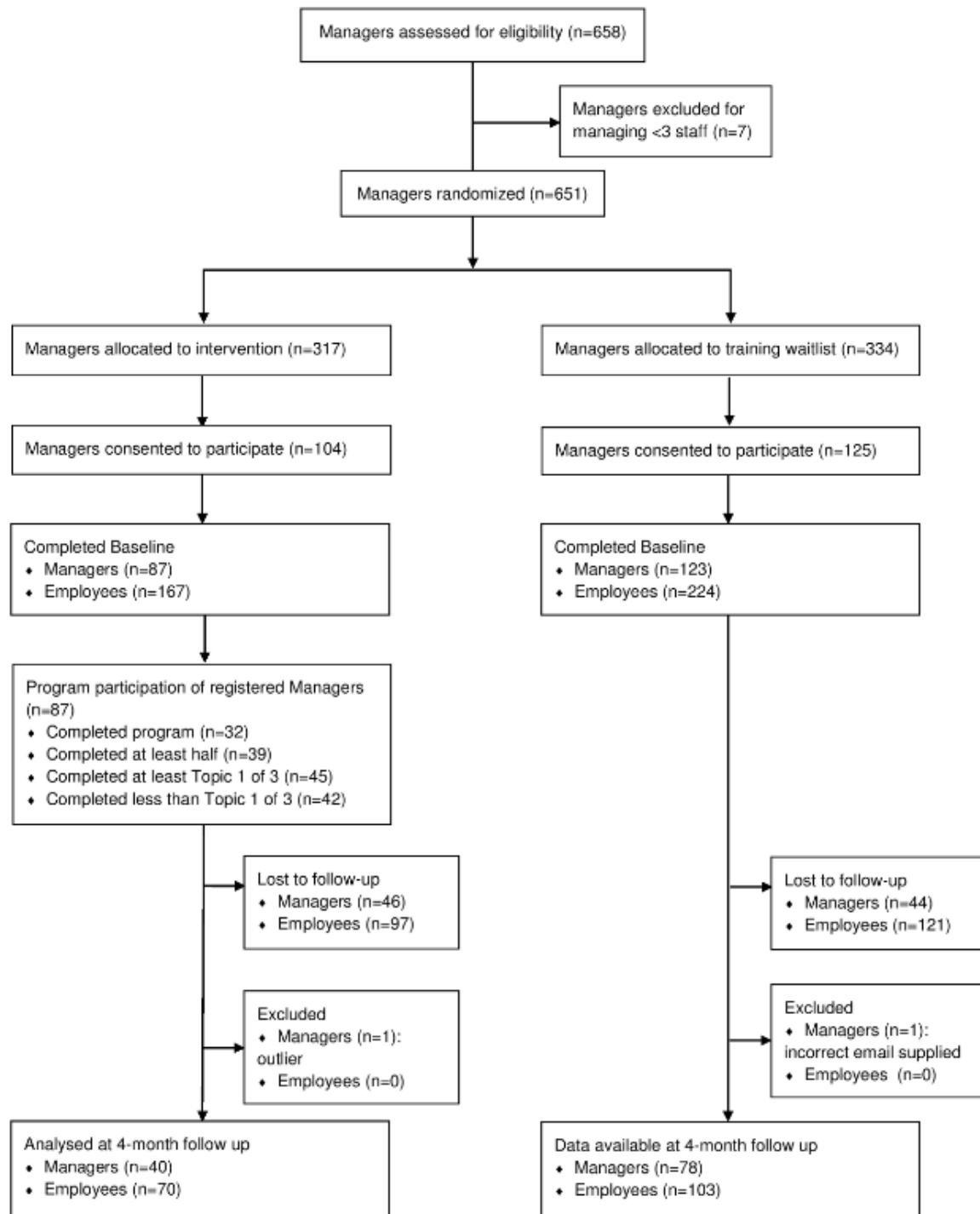
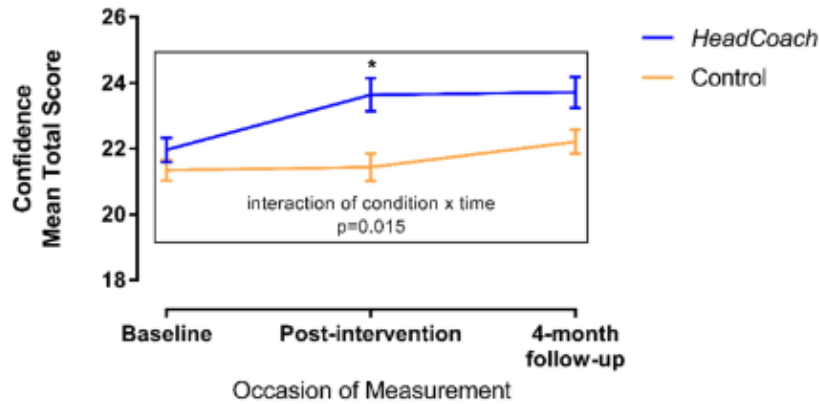
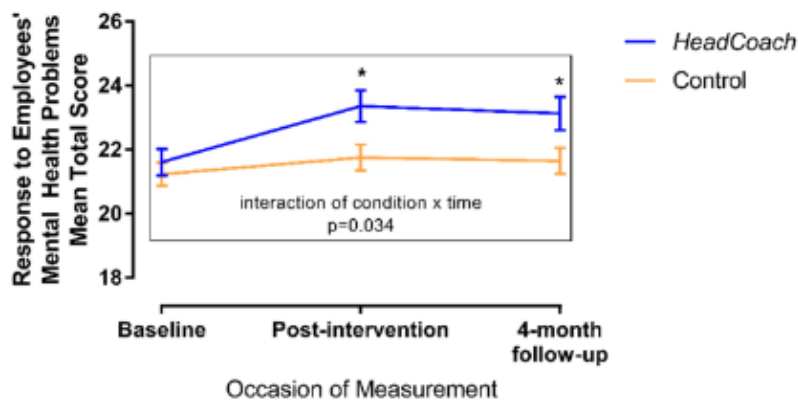


Figure 2: Mean total scores for Managers' a) Confidence, b) Responsive Behaviour and c) Preventive Behaviour. * $P < .05$ as generated by mixed model repeated measures (MMRM) ANOVAs.

A: Managers' confidence



B: Managers' responsive behaviour



C: Managers' preventative behaviour

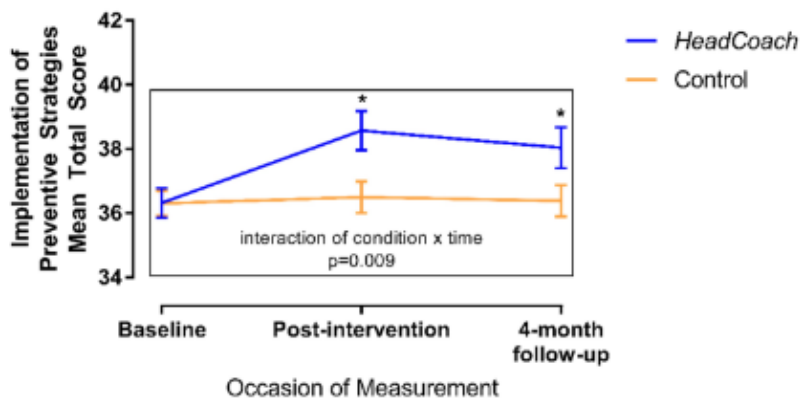
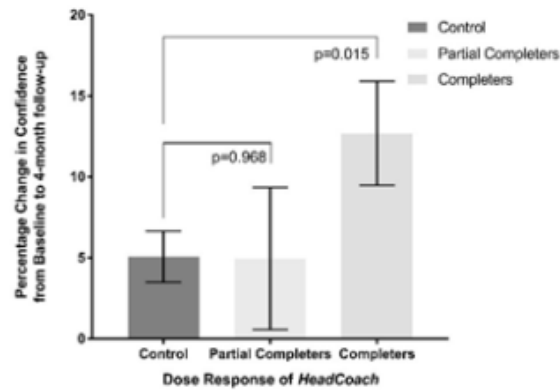
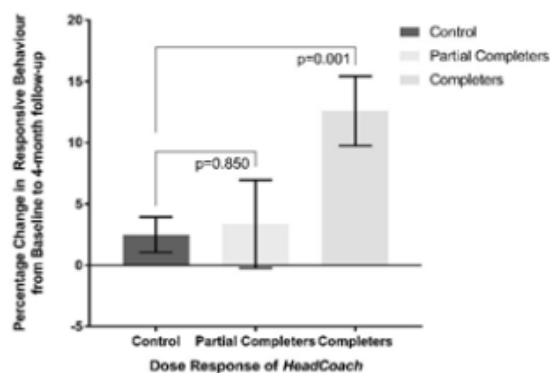


Figure 3: Dose response of the *HeadCoach* manager training on a) Confidence, b) Responsive Behaviour and c) Preventive Behaviour at follow-up. *P*-values generated by mixed model repeated measures (MMRM) ANOVAs.

A: Managers' confidence



B: Managers' responsive behaviours



C: Managers' preventive behaviours

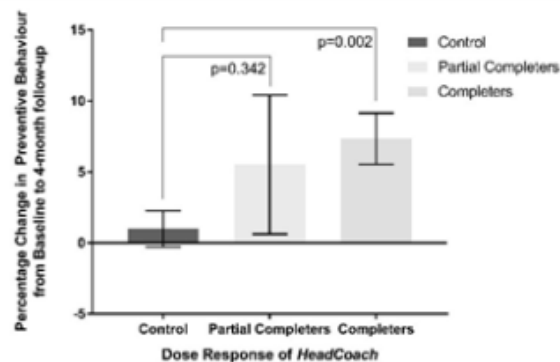


Table Legend

Table 1. Baseline characteristics for the intervention and control groups participating in the HeadCoach trial. * Test of difference between groups carried out using Chi Square with Fisher's Exact Test for Age and Years with Current Employer and Years at current level.

	Intervention Group (N=88)	Control Group (N=128)	Test of difference between groups*
	n (%)	n (%)	P value
Age			
21-30	1 (1.2)	6 (4.9)	.052
31-40	19 (22.1)	36 (29.5)	
41-50	24 (27.9)	42 (34.4)	
51-60	35 (40.7)	35 (28.7)	
60+	7 (8.1)	3 (2.5)	
Gender			
Male	71 (82.6)	102 (83.6)	.24
Female	13 (15.1)	20 (16.4)	
Prefer not to say	2 (2.3)	0 (0.0)	
Organization			
A: Construction	32 (37.2)	45 (36.9)	.83
B: Emergency Services	33 (38.4)	43 (35.2)	
C: Emergency Services	21 (24.4)	34 (27.9)	
Years with current employer			
< 5 years	2 (2.3)	15 (12.3)	.064
5 to 10 years	14 (16.3)	19 (15.6)	
10 to 15 years	22 (25.6)	23 (18.9)	
>15 years	48 (55.8)	71 (53.3)	
Years at current level			
< 1 year	4 (4.7)	6 (4.9)	.47
1 to 5 years	31 (36.0)	52 (42.6)	
5 to 10 years	27 (31.4)	40 (32.8)	
10 to 15 years	17 (19.8)	13 (10.7)	
>15 years	7 (8.1)	11 (9.0)	
Previous Mental Health Training			
Yes	10 (11.9)	15 (12.3)	.56
No	74 (88.1)	107 (87.7)	