

**School-based early intervention for anxiety and depression in older adolescents: A feasibility randomised controlled trial of a self-referral stress management workshop programme (“DISCOVER”)**

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## Abstract

**Introduction** Schools may provide a convenient intervention setting for young people with mental health problems generally, as well as for those who are unwilling or unable to access traditional clinic-based mental health services. However, few studies focus on older adolescents, or those from ethnic minority groups. This study aims to assess the feasibility of a brief school-based psychological intervention for self-referred adolescents aged 16-19 years. **Methods.** A two-arm cluster randomised controlled trial was conducted in 10 inner-city schools with block randomisation of schools. The intervention comprised a one-day CBT Stress programme with telephone follow-up (DISCOVER) delivered by 3 psychology (2 clinical and 1 undergraduate) staff. The control was a waitlist condition. Primary outcomes were depression (Mood and Feelings Questionnaire; MFQ) and anxiety (Revised Child Anxiety and Depression Scale; RCADS). Data were analysed descriptively and quantitatively to assess feasibility. **Results.** 155 students enrolled and 142 (91.6%) followed up after 3 months. Participants were predominantly female (81%) and the mean age was 17.3 years, with equal numbers enrolled from years 12 and 13. Over 55% of students were from ethnic minority groups. Intraclass correlations were low. Variance estimates were calculated to estimate the sample size for a full RCT. Preliminary outcomes were encouraging, with reductions in depression ( $d = 0.27$  CI-0.49 to -0.04,  $p = 0.021$ ) and anxiety ( $d = 0.25$ , CI-0.46 to -0.04,  $p = 0.018$ ) at follow-up.

**Conclusions.** Results support the feasibility of a school-based, self-referral intervention with older adolescents in a definitive future full-scale trial (Trial no. ISRCTN88636606).

Keywords: adolescence, depression, anxiety, schools, self-referral, open-access

## Introduction

Adolescence is a critical time for mental health, with the onset of approximately half of lifetime mental disorders occurring by 15 years (Kim-Cohen et al., 2003). Emotional disorders of anxiety and depression are especially common, with 3-month prevalence rates of 1.6% and 3.1% respectively in 16 year-olds (EJ Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Anxiety and major depressive disorder often co-occur in adolescence (Essau, Lewinsohn, Lim, Moon-ho, & Rhode, 2018). If untreated, these conditions seriously affect young people's developmental progress, with implications for future health, and occupation (Woodward & Fergusson, 2001). Anxious and depressed youth are more likely to suffer from disrupted peer relationships and impaired educational performance (Kochel, Ladd, & Rudolph, 2012; Patalay, Deighton, Fonagy, & Wolpert, 2015). They are also susceptible to substance abuse and other risk-taking behaviours (Fergusson & Woodward, 2002). Further personal and wider societal costs arise from long-term social maladjustment, poor health and correspondingly high service use in early adulthood and beyond (Goodman, Joyce, & Smith, 2011). Suicide and suicide ideation have also been shown to be associated with adolescent emotional disorders (Gould, Greenberg, Velting, & Shaffer, 2003) as well as sub-threshold problems (Balázs J et al., 2013).

Evidence on the effectiveness of services for adolescents is limited and rather mixed. However, contact with mental health services at 14 years has been found to reduce the likelihood of depression at 17 years (Neufeld, Dunn, Jones, Croudace, & Goodyer, 2017). Unfortunately, help-seeking is hindered by a number of structural and attitudinal barriers, particularly the capacity of the specialist mental health services (Smith, Kyle, Daniel, & Hubbard, 2018). There are also problems with inconvenient appointment times and some concerns about stigma, which may be particularly salient for socially disadvantaged and black and minority ethnic (BME) youth (Cauce AM et al., 2002; D. Michelson & Day, 2014). Further, older adolescents have distinctive mental health needs and help-seeking preferences, which may not be well accommodated by "downward adaptations" of

adult treatments or “upward adaptations” of child mental health service models and interventions (Sauter, Heyne, & Michiel Westenberg, 2009; Taylor JA et al., 2014; Weisz & Hawley, 2002).

The middle-to-late teen years can be particularly tumultuous, as characterised by rapid neurobiological changes, associated increases in novelty seeking, reward seeking, impulsivity and risk taking, and the growing influence of peers (Colver & Longwell, 2013). This vulnerable period of brain maturation and social re-orientation coincides with a series of complex developmental tasks (e.g. completing school and entering into further education/employment) as part of an increasing drive towards autonomy and self-determination (Pao, 2017). Consistent with these developmental trends, there is evidence that older adolescents may prefer psychological interventions which encourage self-management and incorporate interactive formats rather than didactic educational programmes delivered by professionals (Farrand, Perry, Lee, & Parker, 2006; Reavley, Yap, Wright, & Jorm, 2011).

When interventions take place in the school setting, some of the common barriers to traditional mental health services including stigma, cost, time and location may be reduced (Barrett and Pahl, 2006; Masia-Warner et al., 2006). Schools have unparalleled contact with young people (Masia-Warner, Nangle, & Hansen, 2006) and school based interventions allow the emotional problems of previously unidentified and untreated young people to be noticed and addressed (Ginsburg & Drake, 2002). In the UK, mental health support in schools is becoming more common with two thirds of schools now offering this (Sharpe et al., 2016). Support is more commonly available in secondary schools and most often provided by educational psychologists followed by counsellors. School-based counselling is one of the most accessed forms of psychotherapy for young people (Cooper, 2013) but their effectiveness has not been well researched (Fox & Butler, 2009) and their capacity limited because counsellors offer 1-1 sessions. Schools also offer support to groups who otherwise might not access the help that they need. For example, a study from North Carolina, USA found that African Americans were equally likely as White Americans to receive mental health

care in schools, despite being under-represented in the specialist mental health services (Angold A et al., 2002).

School-based mental health interventions have been shown to have some modest effects. Recent systematic review (Corrieri et al., 2014; Werner-Seidler, Perry, Calear, Newby, & Christensen, 2017), have shown these interventions have small effect sizes for depression and anxiety at post-treatment. There were also small but encouraging long term effects of programs for depression and anxiety prevention at 12-month follow-up (Werner-Seidler et al., 2017).

Interventions are typically organised in three ways: (1) on a universal basis to all students within one or more classes (2) on a selective (targeted) basis for students identified as being at risk for developing a mental disorder or (3) on an indicated basis for students with more severe symptoms and associated impairment. Trade-offs exist between these approaches (Fazel, Hoagwood, Stephan, & Ford, 2014). While universal interventions enable wide coverage and avoid the stigma potentially associated with targeted interventions, targeted or indicated interventions allow for the identification of students who are most at risk/in need of support. The latter are more stigmatising and time-consuming to implement but tend to lead to higher effect sizes because of higher baseline outcome measures and may be potentially more cost-effective. Differences in effects for depression and anxiety for the different forms of delivery have also been found. While comparable effect sizes between universal ( $g = 0.19$ ) and targeted ( $g = 0.22$ ) preventative interventions for anxiety were found, significantly higher effect sizes of targeted interventions ( $g = 0.32$ ) compared to universal delivery ( $g = 0.19$ ) for depression were found (Werner-Seidler et al., 2017). In an older systematic review of 42 studies, indicated interventions show superior effects compared to universal and selective programmes (Calear & Christensen, 2010). However, when effects for depression and anxiety were combined in 146 studies, longer term (12 month) preventative effects for universal interventions were found but only shorter term (9 months) were found for selective, or indicated programs (Stockings et al., 2016).

Self-referral represents a fourth, relatively novel option for accessing mental health services (JSL Brown, J Boardman, N Whittinger, & M Ashworth, 2010), where students can decide whether or not to refer themselves to an intervention without having to see anyone else in the first instance, or having to be referred through another health professional. Thus, students can decide whether or not to participate in the intervention offered. Self-referral pathways may be especially relevant for adolescents, given the value placed on autonomy and self-management at this developmental stage (Kleinert, 2007; Pao, 2017; Rey, Grayson, Mojarrad, & Walter, 2002). The role of teachers is also relevant. However, in a comparison of teacher and support-staff identification with self-reports for 14-15-year-olds (M. A. Campbell, 2016), staff only identified half the students who reported symptoms. A combination of self-referral and staff referral was therefore recommended. A self-referral does mean there are fewer restrictions on eligibility but adults have been shown to self-refer reasonably accurately; one study showed 75% self-referrers had diagnosable problems (J Brown, Boardman, Elliott, Howay, & Morrison, 2005).

Our group has developed an innovative self-referral intervention model for older adolescents, based on a self-referral adult CBT workshop model (JSL Brown, Cochrane, & Hancox, 2000). The model comprises a one-day stress management workshop with personalised telephone goal review (to be known as DISCOVER workshop programme), which was co-produced with teenagers and fits young people's preferences for more practical, interactive and less time-intensive modes of delivery (Persson, Hagquist, & Michelson, 2017; Plaistow et al., 2014). It was initially pilot tested across five community venues, including one school, in Southwark, South London (Sclare, Michelson, Malpass, Coster, & Brown, 2014). Findings from the pilot provided preliminary evidence of accessibility (high rates of uptake from black and minority ethnic (BME) groups, and students who had not previously used mental health services), acceptability (high rates of satisfaction) and impact (improvements in self-reported anxiety and depression). Notably, demand was highest at the school site, probably related to participants' perceptions of the school as a safe and familiar environment, as well as the encouragement of teachers to self-refer.

A recent meta-analysis identified 25 of the overall 81 school-based depression/anxiety prevention programs as targeting older adolescents (Werner-Seidler et al., 2017). However, the mean age for this sub-set of studies ranged from 14-19 years. To date, there appears to be just one small trial (N = 21; Hains & Szyjakowski, 1990) specifically focusing on a school-based intervention for anxiety and depression in the 16+ age group. Data about ethnic background and disadvantage are often not fully reported, but studies where this is reported seem to indicate that interventions are less effective with those from more disadvantaged and ethnically diverse backgrounds (Kavanagh J et al., 2009). Some studies have specifically targeted disadvantaged populations with some positive results (Mifsud & Rapee, 2005) but such programs remain uncommon in the school-based intervention literature, and insignificant effects have also been found (Roberts et al., 2010).

This study therefore examined the feasibility of implementing and evaluating the DISCOVER workshop programme for older adolescents across a larger number of inner-city secondary schools in London, UK, using a self-referral recruitment route, utilising a more robust cluster RCT design. The objectives were to:

1. Assess feasibility of recruiting and randomising 10 schools.
2. Assess student attendance at information meetings, consent rates and participant attendance at DISCOVER workshops
3. Assess participation rates for students with demographic (e.g. gender, ethnic minority, year of schooling), help-seeking profiles (e.g. whether sought help before) and clinical profiles (e.g. severity of symptoms)
4. Assess data collection rates at baseline and 3-month follow-up.
5. Obtain outcome variance estimates and intraclass correlations (ICC) required for sample size calculations in a full-scale trial.
6. Explore the likely ranges for candidate outcomes by obtaining intervention effect estimates and confidence intervals for depression and anxiety.



## **Methods**

**Study Design.** A single-blind two-arm cluster Randomised Controlled Trial (RCT) compared a one-day DISCOVER workshop programme and a waitlist control condition. Schools were the unit of allocation, minimising the potential for contamination between trial arms; students were the unit of analysis. Outcomes were measured for both arms at baseline and three-month follow-up. Ethical approval was obtained from the Camberwell St Giles National Research Ethics Service (Ref: 14LO1416). The design and outcomes followed the published protocol (D Michelson et al., 2016).

**Participants.** It was decided to approach schools in Southwark and Lambeth within the boroughs of Lambeth and Southwark, which rank respectively as the 22<sup>nd</sup> and 23<sup>rd</sup> most deprived out of 326 UK boroughs (Office for National Statistics, 2015); approximately 85% in Lambeth and 76% of secondary school students in Southwark are from BME groups (Office for National Statistics, 2015). Schools were either approached directly or via a local school heads network and contact then made with Heads of Sixth forms. In total, 16 schools were approached, 12 schools agreed to take part in the two boroughs but 2 did not proceed and 10 (62.5%) finally participated.

Eligible students were 16-19 year olds recruited from sixth forms i.e. academic years 12 and 13. Participants needed to be fluent in English, not have severe learning difficulties, and be available to attend the scheduled one-day workshop. No clinical criteria were used but participants needed to refer themselves to the workshop. Participants judged as being at acute risk (i.e. in need of immediate mental health care) following a risk assessment were excluded. All participants gave written informed consent; parental consent was not required as participants were 16 and over.

**Randomisation.** Schools were randomly allocated in a 1:1 ratio to trial arms following completion of baseline assessments. We deliberately randomized the clusters after the recruitment of students to avoid a selection and recruitment bias of participants as recommended by Murphy (Murphy, Esterman, & Pilotto, 2006). The Consort group also raises ethical concerns about recruiting patients after randomization of clusters because participants can then no longer be legitimately asked for

their consent to be randomized either to the treatment or control arm (M. K. Campbell, Piaggio, Elbourne, & Altman, 2012).

Block randomisation (two blocks of five schools) was performed using an online randomisation system managed by an independent Clinical Trials Unit. Randomisation was implemented by the Chief Investigator and schools were informed of their allocation by workshop leaders. The maximum number of participants per workshop was 15. If this was exceeded, extra workshops were run in those schools and a random number generator used to randomise students into two groups. Research workers were blinded to participant allocation, following a protocol requiring minimal contact with workshop leaders and the use of standardised scripts at follow-up (Karanicolas, Farrokhyar, & Bhandari, 2010). Control schools were offered the intervention 3 months after randomisation.

**Procedures.** The DISCOVER workshop programme and study were publicised by workshop leaders and research workers at sixth-form assemblies. Publicity leaflets were distributed and students invited to attend a lunchtime Information meeting at their school for further details. School staff were given written guidance and advice from the clinical and research team about encouraging suitable students to enrol, using a supportive and non-coercive approach. Attenders of the information meeting were contacted by phone after 48 hours to check their interest in proceeding. Researchers met interested students individually, to complete consent forms and baseline measures. Outcome measures were taken again after 3 months.

Risk assessments were undertaken at baseline meetings if: participants (a) scored above clinical threshold ( $\geq 27$ ) on the Mood and Feelings Questionnaire (MFQ) (EJ. Costello & Angold, 1988) (b) selected 'true' to one or more of four items related to suicidal ideation on the MFQ (c) selected 'sometimes' or 'true' to the item suggesting suicidal intent on the MFQ (d) appeared agitated or flat in mood and/or (e) provided a verbal report of some other harm (e.g. bullying). Indications of potential harm were referred to the chief investigator or DISCOVER workshop lead, to decide if further action was necessary.

## **Intervention**

The DISCOVER 'How to Handle Stress' workshop programme was adapted from an adult version (J. S. L. Brown, Cochrane, & Cardone, 1999) and refined through formative field testing and feedback from a Teenage Advisory Group (Sclare et al., 2014).

**Workshop content:** This focused on methods for coping with common personal and academic stresses experienced by older adolescents, such as social anxiety and worry, dealing with coursework, dealing with family expectations and exam anxiety. Cognitive-behavioural therapy (CBT) principles and methods included psycho-education about the CBT model, fear exposure, thought challenging, mindfulness, problem solving, sleep hygiene and time management which were all explained and demonstrated. Video vignettes were also used to illustrate the difficulties and effects of stress on a young person's thoughts and actions, and demonstrated the techniques in practice. Participants were given workbooks and encouraged to set a personal goal as homework and offered a telephone goal review. Personal goals were selected by students and could relate to social, personal, relationships or schoolwork. Many participants chose to work on goals related to managing school related difficulties, improving their sleep and managing anxious feelings.

**Workshop delivery:** Workshops were co-facilitated by two clinical and one assistant psychologist. An assistant psychologist is a graduate psychologist who has not undertaken clinical training. The team had been trained to deliver the workshop according to a detailed manual. To ensure fidelity, workshop leaders completed an evaluation form after each workshop, recording the completion of manualised components. The workshop was delivered face-to-face in a quiet schoolroom over one day.

**Personalised telephone goal review:** As part of the intervention, after one week all workshop participants were telephoned by a workshop leader for a 20-30 minute call, to monitor goal progress and support their use of CBT coping skills. Participants were offered up to two further goal reviews within the 12-week follow-up period.

**Measures. Primary outcomes** Depressive symptoms were measured using the MFQ (EJ. Costello & Angold, 1988), a 33-item self-reported measure of youth depression, with good validity and reliability in adolescent samples (Brooks & Kutcher, 2001; Burlison Daviss et al., 2006). Higher scores indicate more severe depression (range:0-66, clinical cut-off  $\geq 27$ ). The anxiety sub-scale of the self-report Revised Child Anxiety and Depression Scale (RCADS) was used to measure anxious symptoms (37 items; range: 0-111, cut-off  $\geq 33$ ). The full RCADS (comprising 47 items) was also used to generate an aggregate emotional symptoms score (range: 0-141, clinical cut off  $\geq 70$ ). Good convergent and discriminant validity and internal consistency in school-based samples has been demonstrated (Chorpita, 2000).

**Secondary outcomes.** The Paediatric Quality of Life Enjoyment and Satisfaction Form (PQ-LES-Q) (Endicott, 2006) comprises 15 self-report items. Higher scores indicate better subjective quality-of-life (range 15-75). The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) (Tennant R, 2007) is a 14-item self-reported measure of mental well-being which has been successfully used with adolescents (Clarke A et al., 2011). Higher scores indicate more positive mental wellbeing (range 14-70).

Participant demographics, self-referral details and mental health service history were collected at baseline. Participation rates in trial procedures were recorded using structured record sheets.

**Statistical analysis.** As this was a feasibility trial, power calculations for intervention effects were not applicable. A minimum of 5 clusters per arm (10 schools) were needed to estimate between-group variance and intraclass correlation within each arm. A total sample size of 150 was considered sufficient to obtain stable estimates of population variances for future power calculations (Browne RH, 1995).

Descriptive data are presented using means and standard deviations for continuous data, and frequencies and proportions for categorical variables. Descriptive sub-analyses (chi-squared and Fisher's exact tests) are used to explore participation rates among sub-groups.

To determine the suitability of instruments and level of burden for a future full-scale trial, completion rates for demographic and clinical measures were used. The feasibility of trial procedures was examined using proportions and exact Clopper Pearson 95% confidence intervals (Vollset SE, 1993). The effect size of Cohen's  $d$  (95% CI) was calculated by dividing estimated effect by the pooled standard deviation at baseline.

Clinical outcomes were analysed on an intention-to-treat basis using multi-level models with school as a random factor, with data collected from all participants whether or not they attended the intervention. Pilot and feasibility studies are generally not powered to formally assess treatment effects and do not provide robust effect size estimates for assessing efficacy or for planning subsequent studies (Leon, Davis, & Kraemer, 2011). Our aim was, therefore, to estimate the likely range of intervention effects at three-month follow-up, with baseline outcomes as a covariate (ANCOVA). Estimates of population variances for future power calculations used the upper 80<sup>th</sup> percentile of confidence intervals around the estimates for robust estimates of the standard deviations (Browne RH, 1995). Intraclass correlations (ICCs) to assess the clustering effect of treatment response within schools are presented to inform future power calculations (Ukoumunne et al., 1999).

## **Results**

**Objective One: Assess feasibility of recruiting and randomising 10 schools.** Recruitment took place between April and December 2014 (see Figure 1). Sixteen schools were invited to participate, of which 10 schools participated in the trial (62.5%). Six schools were academies, one was voluntary-controlled, two were voluntary-aided and one was a community school<sup>4</sup>(Government Digital Service, 2016). Nine schools had mixed gender sixth forms and one was an all-girls' school. The sixth forms

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<sup>4</sup> Academies are publicly funded independent schools. Voluntary aided schools are funded jointly, by the local education authority (LEA), the governing body and the charity. Voluntary controlled schools and community schools are funded by the LEA.

had a combined total of 1653 students (range 95-294 per school), the majority of whom (58.5%) were female.

**Objective Two: Assess student attendance at information meetings, consent rates and participant attendance at DISCOVER meetings.** All sixth-form students were invited to attend information meetings, of whom 209 (12.6%) attended. Of these, 155 (74.2%) consented to participate, representing 9.4% of the total students.

Five schools (n=72 students) were randomly allocated to the experimental arm and five schools (n=83 students) to the control arm. At two experimental schools, the upper workshop size of 15 was exceeded and two extra workshops were run.

In the experimental arm 72.2% (n=52) attended the full day intervention, and 11.1% (n=8) attended part of the day. Twelve students (17.7%) did not attend the workshop. More Year 13 (31.8%; n=7) students were non-attenders compared to Year 12 students (10.0%; n=5) ( $\chi^2(2) = 5.92$ ,  $p=0.05$ ). Workshop non-attendance differed between schools (range; 0% to 33.3%, Fishers exact test:  $p=0.001$ ). No significant associations between gender, or baseline clinical outcome scores and workshop attendance were found (all  $p>0.05$ ).

All 52 students who attended the full workshop selected a personal goal. From these, 78.8% (n=41) participated in at least one telephone review, 34.6% (n=18) took part in at least two calls and 7.7% (n= 4) took part in three. No significant differences in age, gender, ethnicity, outcomes at baseline ( $p's>0.25$ ) were found between those who did not attend any, 1 or at 2 and more phone reviews.

Figure 1

**Objective Three: Assess participation rates for students with demographic (e.g. gender, ethnic minority, year of schooling), help-seeking profiles (e.g. whether sought help before) and clinical profiles (e.g. severity of symptoms),**

Participants were predominantly female (81%) and the mean age was 17.3 years (see table 1) which means females were over-represented. The proportion of BME students who participated was 57.4% with the largest ethnic group being black British/black African (44.5%). While reasonably representative, this is slightly lower than the ethnic breakdown of secondary school students in the local boroughs (85% and 76%). Equal numbers enrolled from years 12 and 13. The experimental arm had a larger proportion of year 12 students (69.4%) compared with the control arm (37.3%) and were on average 4.9 months younger. There was a larger proportion of females in the experimental (90.3%) than in the control arm (73.5%).

Two thirds (n=108) had not previously accessed psychological support services. Just over a quarter of students (n=42; 27.3%) scored above clinical cut-off for depression (MFQ) at baseline, while n=75 (48.7%) scored above the threshold on the RCADS-anxiety subscale.

Table 1

One hundred and ten (71.4%) students independently self-referred, and 44 (28.6%) self-referred with the encouragement of a teacher. Those who were encouraged to self-refer had significantly higher depression and anxiety scores (see Table 2). They were also more likely to have sought previous counselling or help from specialist services ( $\lambda^2 = 11.9$ ,  $df=1$ ,  $p=0.001$ ).

Table 2

**Objective Four: Assess data collection rates at baseline and 3-month follow-up.** Rates of missing individual items within a scale were low across the four outcome measures (6.4%). Follow-up measures were taken on average 3.7 months after baseline (mean 15.9 weeks). Overall, the follow-up rate was 91.6% (n=142); 62 students (86.1%) from the experimental arm and 80 students (96.4%) from the control arm completed the outcome assessments at the 3 month follow-up. Follow-up rates differed between trial arms ( $\chi^2(1)=5.3$ ,  $p=0.02$ ) and schools (Fisher's exact test:  $p<0.001$ ). In the experimental arm (N=72), 10 students (13.9%) did not attend follow-up, compared to 3 students

(3.6%) in the control arm (N=83) (see Fig. 1). Almost half of missed follow-up appointments related to one school in the experimental arm. Eleven of the 13 students (84.6%) who did not attend follow-up assessments were from year 12 ( $\chi^2(1)=5.96$ ,  $p=0.015$ ). No differences in gender or baseline outcomes ( $p's>0.05$ ) were found between those who did and did not attend follow-up.

Table 3

**Objective Five: Obtain outcome variance estimates and intraclass correlations (ICCs) required for sample size calculations in a full-scale trial.** Variance estimates for future sample size calculations are shown in table 4. The recommended use of upper 80% confidence intervals as an estimate for future power and sample size calculations resulted in only slightly larger values (<10%) than the observed standard deviations. The estimated ICCs for all outcome variables were negligible (between 0 and 0.003).

Table 4

**Objective Six: Explore the likely ranges for candidate outcomes by obtaining intervention effect estimates and confidence intervals for depression and anxiety.**

The experimental group significantly improved across all outcomes after controlling for baseline differences and clustering of schools (see Table 3). Absolute standardised treatment effect sizes were  $d=0.25$  (95% C.I. 0.46-0.04) for anxiety,  $d=0.27$  (CI 0.49-0.04) for depression,  $d=0.46$  (CI 0.17-0.73) for well-being and  $d=0.36$  (CI 0.09-0.64) for quality of life. Because some schools had two workshops a sensitivity analysis was carried out by replacing the random factor in the experimental arm of the school (unit of allocation  $N=5$ ) by workshop ( $n=7$ ). Treatment effects remained virtually unchanged. Further, sensitivity analyses including school year or gender as a covariate which did differ between trial arms, did not alter the results for any outcomes. Neither variable predicted any outcome (all  $p's >0.05$ ). This indicates the robustness of results. No differences were found in clinical



outcomes at 3 month follow-up for those who did not have any telephone reviews, had one, or two or more reviews.

## **Discussion**

While schools may be an appropriate delivery point for mental health interventions (Department for Children, 2008), school-based mental health provision for older adolescents is under-researched (Hains, 1990). Further, interventions have been universal, selective or indicated (Fazel et al., 2014). This study used a novel self-referral system and sought to test the feasibility of delivering a brief early intervention in schools by conducting a methodologically robust evaluation of its implementation.

Schools generally demonstrated a willingness to participate with 10 out of the 16 schools approached participating (62.5%). In some studies, the participation rate has been 12% (Paul Stallard et al., 2012) and in others it has been 15.3% (Paul Stallard et al., 2014). Student recruitment rates exceeded expected demand of up to 15 students per school. In 2 sites, extra workshops were run because more than 15 students decided to participate. Nearly 60% were from BME backgrounds, broadly reflecting the demographic composition of the area, where approximately 80% of secondary school students are from BME groups. This is consistent with other studies of community-based adult mental health services where self-referral routes have enabled a more equitable representation from ethnic minority populations than conventional clinic-based services (JSL Brown, J Boardman, N Whittinger, & M Ashworth, 2010). Additionally, over two-thirds of participants had not previously accessed formal psychological support, indicating that the self-referral route offers accessible and equitable support for conventionally “hard-to-reach” groups. A high level of participant retention was achieved, with an overall 91.6% follow-up rate at 3 months. This is comparable to some studies where 88% were retained at 3 month follow-up (Cardemil, Reivich, & Seligman, 2002), and 92% were collected at 12 month follow-up (Paul Stallard et al., 2014).

Self-referral in combination with teacher encouragement seems to be a very promising approach, supporting work by Campbell (M. A. Campbell, 2016). Over 70% students self-referred independently and while just under 30% came with teacher encouragement. While there were no ethnic differences between the two groups, there were differences in terms of severity of problems as well as whether they had used services before. This suggests that teachers were able to encourage those with more severe problems to enrol, and who may have been tentative about enrolling. Teacher encouragement may have helped very distressed students who may otherwise avoid or fear new experiences, or feel too depressed to come forward. Similarly, they may have encouraged those who were reluctant to be referred to specialist services or may not have the courage to take up any help.

The issue of sub-threshold depression and anxiety merits discussion. The independent self-referral route allowed a lower ratio of 'cases' to 'non-cases' (or those with sub-threshold symptoms) to come through, compared to self-referral with teacher encouragement. If we examine cases, 21.8% (n=24) of students who independently referred were depression 'cases', in comparison to 40.9% (n=18) those coming with teacher encouragement. With anxiety 'cases', 41.8% (n=46) came forward independently in comparison with 65.9% (n=29) of those with teacher encouragement. However, it is important to remember that those who are 'non-cases' but have sub-clinical symptoms of depression and anxiety still experience functional impairment and that sub-clinical symptoms are a risk factor for future difficulties, including suicide risk (Balázs J et al., 2013). A review of adolescent depression showed a high prevalence of subthreshold depression among adolescents, ranging from 2.2% to 4.9%, which has a negative impact on quality of life and is a significant risk indicator of later depression (Bertha & Balázs, 2013). Indeed, the authors conclude that sub-threshold depression is a good target for preventive interventions.

The study yielded promising preliminary findings of effectiveness for all outcomes, notwithstanding the potential 'floor effect' often associated with sub-clinical baseline scores. Although this study was small, there was a medium effect size for depression with a waiting list

control. The variance estimates and intraclass correlations produced will assist with a phase III trial sample size calculation. Intraclass correlations were negligible, indicating a low degree of similarity in responses of individuals from the same school. Sample size inflation due to the cluster randomization is therefore relatively small (Donner & Klar, 2000). As to be expected for clustered randomized trials, baseline imbalances were observed. To reduce the risk in future trials of the baseline imbalance of prognostic variables, such as gender and school year, stratified randomization should be considered (Ivers NM et al., 2012).

This study has clear strengths, including the pragmatic RCT design and successful rigorous implementation of blinding procedures. A larger trial covering more geographical areas is therefore needed to increase the generalisability of the study, which was conducted in inner-city London schools. A longer-term follow-up would also be informative (Calear & Christensen, 2010). As waitlist control comparator groups may inflate effect sizes (Cuijpers, Van Straten, & Warmerdam, 2007) and limit longer term follow-up, the comparator for a future trial might be treatment-as-usual (TAU), an attention control, or a minimal intervention, such as psychoeducational booklets. This study used self-report measures and a future evaluation would benefit from independent assessment of depression/anxiety. The cost-effectiveness of this group approach could also be usefully assessed.

There was a substantial under-representation (18.7%) of males. Despite evidence to suggest greater rates of depressive and anxious disorders in female adolescents (Merikangas, Nakamura, & Kessler, 2009), boys in this age group have been shown to be very reluctant to seek help (Moller-Leimkuhler, 2002). Modifications, such as including a male member of DISCOVER staff at assemblies may aid recruitment of this group although other attitudinal changes to reduce stigma may also be warranted.

Steps were taken to reduce the possibility that the day-long workshop could have led to feelings of stigmatisation and hence reduce study participation. Schools commonly have day events for sixth forms, for which students have to sign up individually. The DISCOVER workshops were offered as a day event and introduced by a senior teacher. A presentation by the workshop leader

about the workshops sought to normalise the experience of stress and the benefits of learning techniques to deal with stress to manage life. There was no mention in the presentation of mental health or illness, and the terms anxiety or depression were not used. The intervention was publicised to all sixth formers as being potentially beneficial to everyone. Reassurance was also given that the personal information shared during the workshop would remain confidential to participants.

Implementing the trial in schools was a challenging process. Contacting students to arrange individual meetings is usually time-consuming for researchers (Fisher, Masia-Warner, & Klein, 2004; Paul Stallard et al., 2012). Group assessment meetings may reduce this problem. Time was also required of teachers and students, and space was needed for the interviews and workshops (P. Stallard & Buck, 2013). However, the one day format fits in with the school schedule as opposed to programmes requiring weekly sessions which require more time and organisation. Although teachers recognise the importance of social and emotional development, the priority of schools for staff and students is still academic attainment. This probably explains why 11% of students only attended part of the workshop and the lower rates of attendance by year 13 students who were due to sit national exams later in the year compared to year 12 students. Ideally, workshops should be scheduled to allow students to stay for the full duration of the workshop, requiring careful timetabling around exam schedules and wider school activities.

School-based interventions are not easy to implement in busy schools but day-long workshops may be popular (as opposed to weekly interventions) as other day events are also run for 6<sup>th</sup> formers. The uptake and retention for this interactive programme have proved to be good. A self-referral and teacher support system would fit in with the desire for self-management of older adolescents and is likely to both encourage vulnerable but reluctant students - as well as those with subthreshold problems – to come forward. And it has engaged a high proportion of students from a BME background as well as those who have not previously sought help.

**Conclusions.** This study demonstrates that the delivery and evaluation of self-referral DISCOVER workshop programme are feasible in schools. It provides the basis for a larger RCT, focussing on effectiveness and enabling sub-group analyses of intervention effects. Provided the phase III trial reports effectiveness and acceptability, the DISCOVER workshop programme could constitute a much-required source of accessible support for older adolescents.

**Conflict of interests:** none.

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Variable	Arm						
	Combined		Experimental		Control		
	N	%	N	%	N	%	
Total students	155	100.0	72	46.5	83	53.6	
Gender	Male	29	18.7	7	9.7	22	26.5
	Female	126	81.3	65	90.3	61	73.5
Age	Years (mean sd)	17.3	0.77	17.1	0.73	17.5	0.76
Ethnicity	White British	34	21.9	14	19.4	20	24.1
	White other (incl Irish)	15	9.6	6	8.3	9	10.8
	Asian or British Asian	11	7.1	6	8.3	5	6.0
	Black or Black British	69	44.5	38	52.8	31	37.3
	Mixed Background	8	5.2	2	2.8	6	7.2
	Chinese	1	0.6	1	1.4	0	0.0
	Other	16	10.3	5	6.9	11	13.3
	Prefer not to say	1	0.6	1	1.2	0	0.0
School	A	20	12.9	20	27.8	0	0.0
	B	19	12.3	0	0.0	19	22.9
	C	17	11.0	17	23.6	0	0.0
	D	7	4.5	7	9.7	0	0.0
	E	15	9.7	15	20.8	0	0.0
	F	15	9.7	0	0.0	15	18.1
	G	23	14.8	0	0.0%	23	27.7
	H	9	5.8	0	0.0	9	10.8
	I	17	11.0	0	0.0	17	20.5
	J	13	8.4	13	18.1	0	0.0
School Borough	Lambeth	55	35.5	55	76.4	0	0.0
	Southwark	100	64.5	17	23.6	83	100.0
School year	Year 12	81	52.3	50	69.4	31	37.3
	Year 13	74	47.7	22	30.6	52	62.7
Teacher recommend	Yes	44	28.6	26	36.6	18	21.7
	No	110	71.4	45	63.4	65	78.3
English 1st language	Yes	124	80.0	58	80.6	66	79.5
	No	31	20.0	14	19.4	17	20.5
Previous counselling	Yes	47	30.3	20	27.8	27	32.5
	No	108	69.7	52	72.2	56	67.5
Type of help	School	16	34.8	9	45.0	7	26.9
	CAMHS	9	19.6	3	15.0	6	23.1
	Private organisation	3	6.5	0	0.0	3	11.5
	Youth counselling	2	4.3	1	5.0	1	3.8
	Not specified	16	34.8	7	35.0	9	34.6
Help received	CBT	4	8.9	2	10.5	2	7.7
	Talking therapy	16	35.6	8	42.1	8	30.8
	Whole-family therapy	1	2.2	0	0.0	1	3.8
	Not specified	19	42.2	8	42.1	11	42.3
	Unknown to participant	5	11.1	1	5.3	4	15.4

**Table 1. Baseline characteristics of participants.**

	<b>Self-referred independently n=110 (71.4%)</b>	<b>Self-referred with encouragement of teacher n=44 (28.6%)</b>	<b>Significant differences</b>
<b>Gender</b>			
male	17	12	$\Lambda^2 = 2.82, df=1, p=0.074$
female	93	32	
<b>Ethnic background</b>			
white British	22	12	$\Lambda^2 = 3.6, df=2, p=0.16$
BME	88	31	
prefer not to say		1	
<b>year</b>			
year 12	56	24	$\Lambda^2 = 0.17, df=1, p=0.4$
year13	54	20	
<b>Previous experience of counselling/therapy</b>			
no	86	22	$\Lambda^2 = 11.9, df=1, p=0.001$
yes	24	22	
<b>Depression scores</b>	18.35 (SD=10.36)	25.7 (SD=12.01)	$F(152)=3.79, p=0.000$
<b>Depression ‘cases’</b>			
<b>cases (% within referral group)</b>	24 (21.8%)	18 (40.9%)	$\Lambda^2 = 5.8, df=1, p=0.015$
<b>non-cases (% within referral group)</b>	86 (78.2%)	26 (59.1%)	
<b>Anxiety</b>	48.45 (SD=11.36)	56.35 (SD=13.33)	$F(152)=3.705, p=0.000$
<b>Anxiety ‘cases’</b>			
<b>cases (% within referral group)</b>	46 (41.8%)	29 (65.9%)	$\Lambda^2 = 7.3, df=1, p=0.006$
<b>not cases (% within referral group)</b>	64 (58.2%)	15 (34.1%)	

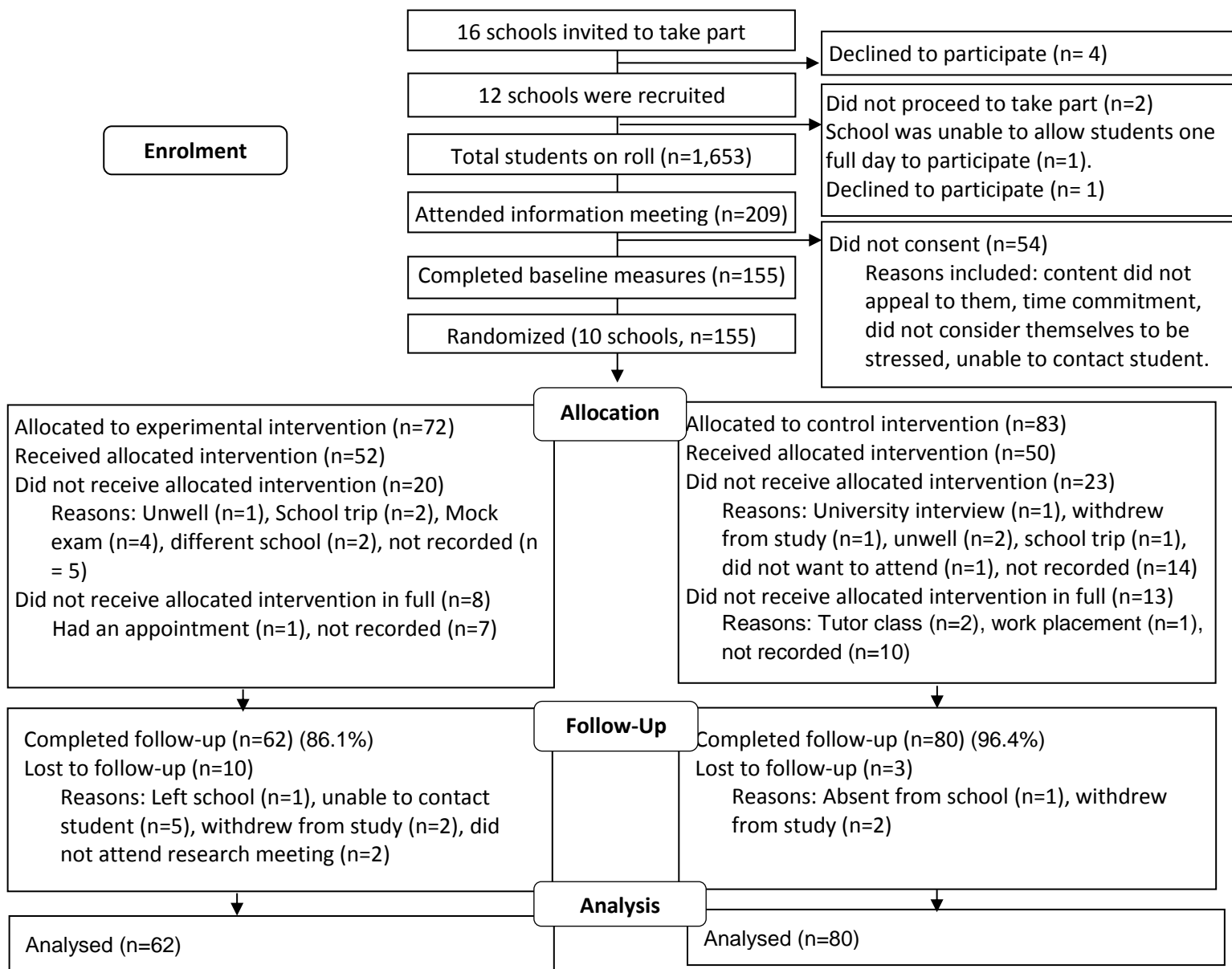
**Table 2 Differences between students who self-referred independently and with teacher encouragement**

Measure	Experimental		Control		Mixed model analyses			
	Baseline (N=72)	3 months (N=62)	Baseline (N=83)	3 months (N=80)	Treatment effect (95% CI)	z	p	Cohen's d (95% C.I.)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)				
PQLESQ	0.6 (0.1)	0.7 (0.1)	0.6 (0.1)	0.6 (0.1)	0.046 (0.011 to 0.081)	2.60	0.009	0.36 (0.09 to 0.64)
MFQ Total	20.3 (11.9)	14.8 (8.9)	20.8 (10.9)	18.1 (10.4)	-3.03 (-5.61 to -0.46)	-2.31	0.021	-0.27 (-0.49 to -0.04)
WEMWBS	42.9 (8.1)	47.5 (8.3)	41.2 (7.5)	43 (7.1)	3.57 (1.37 to 5.76)	3.19	0.001	0.46 (0.17 to 0.73)
Anxiety T	51.1 (12.9)	45.2 (10.8)	50.6 (12.1)	48 (12.1)	-3.12 (-5.71 to -0.53)	-2.36	0.018	-0.25 (-0.46 to -0.04)
RCADS T	51.7 (12.9)	45.4 (10.9)	51.3 (12.2)	48.8 (11.9)	-3.45 (-6.01 to -0.88)	-2.64	0.008	-0.28 (-0.48 to -0.07)

**Table 3. Outcomes by treatment arm at baseline and 3-months and estimated treatment effects at follow-up after controlling for baseline measures and school as random factor using a mixed effects model.**

SD estimates at baseline		Mean	Above clinical cut-off n (%)	observed SD	bSE	lower 80%	upper 80%	lower 95%	upper 95%
PQLESQ	155	0.602	N/A	0.127	0.006	0.119	0.135	0.115	0.139
MFQ	155	20.56	43 (27.7%)	11.36	0.60	10.59	12.14	10.18	12.54
RCADS Anxiety	155	50.81	12 (7.7%)	12.46	0.78	11.46	13.46	10.93	13.99
RCADS Total	155	51.48	11 (7.1%)	12.51	0.82	11.46	13.55	10.90	14.11
WEMWBS	155	41.99	N/A	7.84	0.43	7.29	8.39	7.00	8.69

**Table 4. Outcomes at baseline, including variance estimates. Observed SD at baseline with bootstrap SE (bSE) confidence intervals.**



**Figure 1.** Consort diagram showing participant flow throughout the trial.