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### A pre-post evaluation of OpenMinds

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in Universities and Secondary Schools

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**A pre-post evaluation of OpenMinds: a sustainable, peer-led mental health literacy programme in universities and secondary schools**

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**A pre-post evaluation of OpenMinds: a sustainable, peer-led mental health literacy programme in universities and secondary schools**

**Abstract**

**Background.** Engaging young people in the design and delivery of mental health education could lead to more effective interventions, however few of these interventions have been evaluated. This study aimed to gain preliminary evidence with regards to the efficacy and acceptability of OpenMinds: a peer-designed and facilitated mental health literacy programme for university and secondary school students. The programme involves a structured programme of education and training for university medical students, who then deliver workshops in secondary schools.

**Methods.** Pre- and post- surveys were completed by 234 school students who received two workshops and 40 university medical students who completed the OpenMinds programme and delivered the workshops. The main outcomes in both groups were components of mental health literacy (non-stigmatising attitudes, knowledge, social distance and helping attitudes). Perceived teaching efficacy and interest in mental health careers (university medical students) and workshop acceptability (school students) were also examined.

**Results.** University and school student participation in OpenMinds was associated with significant improvements in three of four mental health literacy elements in both samples. Knowledge and attitudes improved in both samples, social distance improved only in the university sample and knowledge of helping behaviours increased in the school sample. University students' perceived teaching efficacy improved but there was no change in their reported interest in pursuing psychiatry in their career. Acceptability was high: over 70% of the school students agreed that they enjoyed the workshops and liked being taught by a university student.

**Conclusion.** This study provides preliminary evidence for the acceptability and efficacy of OpenMinds as a sustainable peer-led model of mental health education for young people. The OpenMinds programme is ready for efficacy testing in a randomised trial.

**Keywords.** Education, task shifting, stigma, mental illness, psychopathology, young people, peer, psychiatry

## Introduction

Mental disorder symptoms are highly prevalent in adolescence and are associated with a range of negative outcomes including ongoing mental health difficulties in adulthood (Kessler et al., 2005; Patel, Flisher, Hetrick, & McGorry, 2007). Few young people seek and receive treatment for these symptoms (Burns et al., 1995; Neufeld, Dunn, Jones, Croudace, & Goodyer, 2017), with reasons including low problem recognition, preference for informal sources of help such as friends and family, and negative attitudes and stigma associated with seeking professional help (Furnham, Cook, Martin, & Batey, 2011; Gulliver, Griffiths, & Christensen, 2010; Hunt & Eisenberg, 2010; Rickwood, Deane, Wilson, & Ciarrochi, 2005; Zwaanswijk, Verhaak, Bensing, van der Ende, & Verhulst, 2003). By increasing awareness of symptoms and sources of help, increasing social support and reducing stigma, school and university-based mental health education could help to facilitate early recognition of mental disorders and improve access to treatment among young people (Sheffield, Fiorenza, & Sofronoff, 2004; Vogel, Wade, & Hackler, 2007; Wright, Jorm, Harris, & McGorry, 2007). However, school staff often feel ill-equipped to discuss mental health with their students due to their limited knowledge and training on this topic (Harland, Dawson, Rabiasz, & Sims, 2015; Koller & Bertel, 2006).

In recognition of the importance of mental health literacy in young people and their limited exposure to this topic within the school curriculum, there are many models of mental health literacy interventions that have been introduced in schools including ones that are teacher

delivered (Milin et al., 2016), mental health professional, and other third party delivered (Chisholm et al., 2016; Pinfold et al., 2003). The empirical evidence for most school based mental health literacy interventions has been quite limited (Kelly, Jorm, & Wright, 2007; Schachter et al., 2008) and until recently pre- post-intervention test designs provided the best evidence for their effectiveness (Pinfold et al., 2003; Watson et al., 2004). Recent years have seen an increase in the number of randomised trials of mental health literacy programmes (Chisholm et al., 2016; Milin et al., 2016), thus improving the strength of the empirical evidence base for such programmes.

Mental health education programmes run by either mental health professionals or third party organisations have been shown to reduce stigma and improve attitudes (Chisholm et al., 2016; Milin et al., 2016; Pinfold et al., 2003; Watson et al., 2004), but often operate in schools at a significant financial cost. This reduces the feasibility and sustainability of such programmes in an environment of cost-cutting and limited school budgets, with lack of funding being identified by schools as a key barrier to their mental health provision (Patalay et al., 2016). A review of evidence, mainly from the US and the UK, suggested that peer-delivered health promotion interventions for young people may be beneficial across a range of health-related areas including mental health, which has been attributed to peer educators being able to relate to and communicate appropriately with members of the target group (Harden, Oakley, & Weston, 1999; Patton et al., 2016; Plan UK, 2014). Robust trials comparing peer-led interventions to teacher-led and no intervention controls have been shown to be effective and popular with adolescents in UK schools in other areas of health education such as sex education (Stephenson et al., 2008).

Lack of recruitment into psychiatry is an international problem (The Lancet, 2012). In the UK this has been an ongoing crisis (Brockington & Mumford, 2002), for example, in 2012 more than 20% of core training posts in psychiatry were unfilled (Mukherjee, Maier, & Wessely,

2013). Recruitment of overseas graduates has hidden the lack of UK medical school graduates choosing psychiatry (Mukherjee et al., 2013). The lack of recruitment has been attributed to stigma from other clinicians and public misconceptions of psychiatry (Henfrey, 2015). The Royal College of Psychiatrists implemented a 5-year recruitment policy which targets both school and medical students, as well as foundation doctors. The policy explicitly outlines a role for student-selected components using medical students to deliver educational workshops in schools (Brown, 2012). Innovative teaching strategies and exposure to psychiatry at an early stage in their degree could also help to support and encourage medical students' interest (Lyons, 2013; Prasad, Nair, Gadhvi, Barai, & Lami, 2016). The approach of targeting the mental health literacy levels of the deliverers of a school-based mental health literacy programme is not uncommon and can be seen in studies that have focussed on improving literacy in both school teachers and students (Jorm, Kitchener, Sawyer, Scales, & Cvetkovski, 2010).

OpenMinds is a mental health literacy programme designed and facilitated by university students in the UK. It involves training university students to deliver mental health literacy workshops in secondary schools. We describe the OpenMinds model and its background in the next sections.

### ***Overview of the OpenMinds model***

OpenMinds was inspired by existing student-led education programmes such as Sexpression (<http://sexpression.org.uk/>) and aims to: (i) promote an understanding of mental health as an essential component of general health and wellbeing, and reduce stigma associated with mental ill health; (ii) enable young people to recognise mental health problems in themselves and their family and friends; (iii) improve knowledge about helping behaviours and how to access mental health services; and (iv) encourage university students to consider careers in mental health.

OpenMinds comprises of three sequential components: The *Crash Course*, *Classroom Training*, and *Workshops* organised by a team of 'OpenMinds facilitators' at each university, comprising

of students who underwent the OpenMinds programme in a previous year and volunteer to be part of the facilitating team. Facilitators appoint a mental health clinician ('clinical lead') to provide guidance and address any ethical or student concerns. The Crash Course involves 6-8 sessions providing university students with information about a range of key child and adolescent mental health topics including depressive disorders, anxiety disorders, psychosis, eating disorders, substance misuse and self-harm. During each session a mental health professional (psychiatrist or clinical psychologist) presents on one of the topics, followed by the university students working in groups to devise activities for adolescents based on the content of the talk, with support from the mental health professional. Classroom Training (1-3 sessions) equips university students with teaching skills to plan and deliver a workshop, facilitated by experienced educators (these varied between institutions but were always delivered by higher education trainers or school teachers). University students practice and receive feedback on these skills by delivering a short lesson ('micro-teach') to educators and their peers.

The workshops in secondary schools put university students' knowledge and skills into action and aim to provide school students with information about mental health problems and where to get help. Medical students were expected to do a minimum of two workshops as part of the programme and the same students did both workshops in each school, with some doing more workshops depending on demand. Schools are offered two OpenMinds workshops as a minimum and some schools request more workshops. Schools select the Year group(s) in their school who will receive the workshops and decide where these will take place. In general, workshops are delivered during the PSHE (personal, social and health education) classes. Participating schools are invited to select topics from the Crash Course that are most relevant to their students. To date the most popular requests from schools include sessions on a general introduction to mental health and on depression and anxiety.

In pairs, university students develop 45-50 min workshop plans on these topics, incorporating activities devised during the Crash Course. The students develop these workshops with the focus on informing school students about general presentations of difficulties (to improve recognition), presenting information in non-stigmatising manner and also informing students about help available. The OpenMinds facilitators review each plan and liaise with mental health professionals about the suitability of the content. University students then deliver workshops in pairs to a classroom (15 to 30 school students) in the presence of a school teacher. After the workshops, university students meet for a final session to provide feedback and to recruit OpenMinds facilitators for the following year.

The university medical students have to meet several ‘quality criteria’ before they are permitted to deliver workshops in schools: completing a Disclosure and Barring Service check; achieving the required attendance at the Crash Course sessions (which is set at a minimum of 80%); passing a multiple-choice question assessment based on the Crash Course content; attending Classroom Training and delivering an assessed micro-teach.

### ***History, feasibility and sustainability***

OpenMinds was started at University College London (UCL) in 2009 by two undergraduate medical students. Between the 2009-10 and 2012-13 academic years (4 academic cycles) at UCL, 79 university medical students completed the programme and delivered lessons to an estimated 1600 secondary school students. Since then the programme has expanded to King’s College London (KCL) and Imperial College London (ICL), Barts and the London School of Medicine and Dentistry and Hull York Medical School. This evaluation was conducted at UCL, KCL and ICL in the 2013-14 and 2014-15 academic cycles.

The OpenMinds model is flexible to adaptations, providing the components (Crash Course, Classroom Training and Workshops) and quality criteria are retained. For instance, at UCL and KCL, OpenMinds runs over one or two terms as a student-selected component of the

undergraduate medical student curriculum, whereas at ICL, OpenMinds is a voluntary organisation for medical undergraduates and the Crash Course runs over a weekend.

In contrast to existing mental health education programmes, OpenMinds is entirely organised and facilitated by undergraduate students. This has several advantages. First, because young people design and deliver the programme, as well as the workshops, the content and materials are relevant and appropriate for the target audience. Second, it contributes to the sustainability of the intervention as university students who have participated in the programme are recruited as OpenMinds committee members the following year. Using this approach, the programme has run successfully at the original founding university (UCL) since 2009 and is still running at 5 out of the 6 universities that have taken it up since 2013. Third, task-shifting mental health promotion from specialised health workers to undergraduate students reduces the potential costs of an intervention, while increasing mental health literacy in two target populations.

### **The current study**

This study aims to collect preliminary evidence on whether OpenMinds is an efficacious and acceptable programme, in both the university student facilitators and the school students receiving the workshops, using a pre-post survey design.

## **Methods**

### **Evaluation design**

The study uses a pre- and post- intervention design to assess the efficacy of the OpenMinds programme. For both university and school students the main outcome was mental health literacy, comprising the elements of knowledge, non-stigmatising attitudes, helping attitudes and social distance (Jorm, 2000; Pinfold et al., 2003) Perceived teaching efficacy and interest in pursuing psychiatry as a training speciality (university students) and workshop acceptability (school students) were also examined.

### **Procedure**

University medical students taking part in the OpenMinds programme were eligible to participate in the evaluation. The students were informed of the study and provided consent if they agreed to take part (taking part in the study was not a pre-requisite of taking part in the programme). Study participants completed the surveys during an introductory session at the start of the programme and again during the final session held after the workshops.

In schools, all students from the participating year group who were present during the OpenMinds sessions were eligible to take part. Schools sent information and opt-out consent letters to parents/carers of all students in the year group to be receiving OpenMinds workshops two weeks before the workshops. School students were informed about the study using a standardised information sheet and provided their consent before completing the survey in class at the beginning of the first OpenMinds workshop and again at the end of the second workshop. School students received two workshops over 2-3 weeks.

### **Participants**

#### ***University medical students***

Data from 40 university medical students (26 female) of the 56 possible students, who completed pre and post surveys (representing about 75% of participants in the programme across the three universities) are analysed. Of the 16 students who are not included in the analysis, 15 were lost to follow-up as they were absent at the debrief session at the end of all the elements of the programme where the post-surveys were collected and 1 medical student declined to participate in the evaluation. Half the analysed students (n=20) were first year medical students, 15 were third year students and the rest were either fourth (n=3) or fifth year students (n=2). Mean age of participants was 20.97 (SD=3.06) and 27 identified as White followed by 7 Asian, 2 Black and 3 other ethnicities. Students also indicated their parents' highest educational qualification – maternal education (12 high school (typically education to age 16 years), 21 university and 6 post-graduate) and paternal education (5 high school, 24 university and 10 post graduate level).

<insert CONSORT Figure 1 around here>

### ***School students***

The schools scheduled to receive OpenMinds workshops at the time of the evaluation were invited to participate in the evaluation (and three out of the four agreed). All the schools were state funded and mixed sex (the largest school was mixed sex but with predominantly boys). 335 school students completed the pre-survey and 291 completed the post survey. We used data from the 234 school students who attended two workshops and completed both pre- and post-surveys (60% response rate). School students were in Year 9 (age 13-14 years, N=117) or Year 10 (age 14-15 years, N=117) and 70% were male (n=164). These school years were selected as the target group because they were the year groups that were most commonly requested by schools in previous years and these years correspond to ages (13-15 years) where prevalence of mental health difficulties increases (Angold, Costello, & Worthman, 1998). In terms of

ethnicity, 46.5% of school students identified as White, 16.1% as Black and 14.8% as Mixed. Others identified as Asian (10.9%) and or other ethnicities (11.7%).

Table 1 presents demographic characteristics and outcome scores of both samples at baseline and includes a comparison with individuals lost to follow-up (i.e. only have pre time point scores). No differences were found at baseline between participants lost to follow-up and those that participated at both time-points in either the university medical student or the school student samples.

*<Table 1 about here>*

## **Measures**

### *University medical students*

The measures for some components of mental health literacy (disorder identification, helping attitudes) were adapted from an Australian study of young people, which includes a vignette and questions based on the vignette (Cotton, Wright, Harris, Jorm, & McGorry, 2006; Jorm & Wright, 2008). The social distance element is from a British study in adolescents (Pinfold et al., 2003). The knowledge and teaching efficacy questions were devised by the evaluation team.

We first included a vignette describing a young person, ‘John’, with symptoms of psychosis which has been developed for use with young people (Jorm & Wright, 2008). The vignette was followed by a series of questions related to John’s situation.

*Disorder identification.* University students were asked to identify the problem John was facing and responses were scored 0 or 1 based on accuracy of their response and this was followed by an assessment of their confidence in their response (‘very confident’ to ‘not at all confident’), which was coded as confident if they responded with very or fairly confident and the remaining responses were coded 0.

*Ask for help themselves.* Students were then asked if they would ask for help themselves if facing difficulties such as John's (yes, no, not sure; yes coded 1) and how confident they felt in their ability to help John ('very confident' to 'not at all confident'), which was coded as confident if they responded with very or fairly confident and the remaining responses were coded 0.

*Helping attitudes.* University students then answered questions on whether certain approaches to help John were 'helpful', 'harmful', 'neither' or 'not sure' (e.g. listen to his problems in an understanding way). Correct responses received a score of 1 and incorrect or not sure, 0. These scores were averaged to form a total helping attitudes score (possible range: 0-1).

*Non-stigmatising attitudes.* Non-stigmatising attitudes towards mental illness were assessed using four items that asked if students agreed or disagreed (Strongly agree to strongly disagree) with statements (e.g. 'John could snap out of it if he wanted to')(Cotton et al., 2006). Items were coded such that higher scores indicated less stigma and more positive attitudes towards individuals with mental health problems. Items were averaged to create a non-stigmatising attitudes score (possible score range 1-5).

*Social distance* or planned behaviours were assessed with five items asking if they would be happy ('yes definitely', to 'definitely not') to participate in different activities with John, (e.g. go out together) (Pinfold et al., 2003). Item responses were averaged and a higher score indicates greater social distance (possible score range 1-5)

*Knowledge.* University students' knowledge about common mental disorders and mental health services in the UK were examined with ten multiple choice questions. For example: 'Which of these is not an anxiety disorder (Panic disorder, Obsessive Compulsive disorder, Phobias, Post-traumatic stress disorder, Bipolar disorder)'; 'In the UK, the standard for defining types of mental disorders is contained in the: (British Psychological Association's Classification Manual,

Royal College of Psychiatrists Diagnostic Guidelines, World Health Organisation's International Classification of Diseases, Diagnostic and Statistical Manual of Mental Disorders, European Diagnostic Manual for Mental Illness)'. Correct responses scored 1 and incorrect 0. Response scores across the ten questions were averaged to create a knowledge score (range 0-1), higher score indicating greater knowledge.

*Perceived teaching efficacy*, which captured students' confidence (How confident do you feel with each of the following? 6-point scale: 'not at all confident' to 'extremely confident') to successfully teach about mental health to adolescents in a classroom environment, was assessed by eight questions covering confidence in students' knowledge about mental illness (3 items; e.g. 'Your knowledge of the symptoms of mental disorders?') and their ability to teach and communicate this knowledge to school students (5 items, 'Your ability to present in front of a class of young people?'). Item responses were averaged to create a teaching efficacy score (possible range 1-6), where higher scores indicate greater confidence in teaching ability.

*Interest in Psychiatry*. Lastly, we asked about medical students' interest in undertaking postgraduate training in psychiatry ('At this point in your medical career how inclined are you to choose Psychiatry as your specialty?') on a scale of 1-10 where a higher score indicates greater interest.

### ***School students***

Questions related to three of the four mental health literacy elements (non-stigmatising attitudes, knowledge and social distance) were adapted from an evaluation of a mental health literacy intervention in UK secondary schools (Pinfold et al., 2003). Questions regarding helping attitudes were adapted from the same questionnaire as for the university students (Cotton et al., 2006; Jorm & Wright, 2008).

*Non-stigmatising attitudes* were assessed through items that asked students to what extent they ‘agree’, ‘disagree’ (or were ‘not sure’) with five statements on stigma and attitudes towards people with mental health problems (e.g. ‘People with mental health problems are difficult to talk to.’). Correct responses were scored 1 and incorrect responses and not being sure scored 0. Item scores were averaged to create a non-stigmatising attitudes score with a possible range from 0-1, higher scores indicating greater levels of non-stigmatising attitudes.

*Knowledge.* School students answered four fact-based questions (e.g. ‘One in four people will develop mental illness over the course of a lifetime.’) with the response options ‘agree’, ‘disagree’ or ‘not sure’. Correct responses were scored 1 and incorrect responses and not being sure scored 0. Item scores were averaged to create a knowledge score with a possible range from 0-1, higher scores indicating greater levels of knowledge.

*Social distance.* School students then answered four questions assessing social distance and planned behaviours (e.g. ‘Would you be able to be friends with someone who had mental health problems?’) with the response options ‘Definitely’, ‘Probably’, ‘Not sure’, ‘Probably not’, ‘Definitely not’. Item responses were scored from 1-5 and averaged to create a social distance score where higher scores indicate greater social distance.

*Vignette and helping attitudes.* School students read a brief vignette describing a fictional friend with symptoms of depression (sad, worried, trouble sleeping, not eating well, can’t focus on school work, etc.), adapted from the same source as the vignette used for university students (Cotton et al., 2006). Following the vignette school students answered a question (Leighton, 2010) about whether their friend was experiencing difficulty and how serious they thought their friends difficulties were (‘no difficulty’, ‘not serious’ to ‘very serious’; serious or very serious coded 1). Similar to the university student survey, school students then answered questions on whether some suggestions to help their friend were ‘helpful’, ‘harmful’ or ‘neither’ (or ‘not sure’).

*Acceptability.* To evaluate the acceptability of the programme, we asked school students how much they agreed (5-point response, ‘strongly agree’ to ‘strongly disagree’) with four statements about OpenMinds, including whether they enjoyed lessons (‘I enjoyed the lessons by OpenMinds’), liked being taught by university students (‘I liked being taught by university students’), learned something new in the lessons (‘I learned something new about mental health in these lessons’) and would recommend OpenMinds to other school students (‘I would recommend OpenMinds to other students’).

### **Analysis**

We present descriptive statistics for university and school students at pre and post intervention time-points. For continuous outcomes we used paired sample t-tests to evaluate the impact of OpenMinds on each measured element of mental health literacy and estimated effect sizes using Cohen’s d estimation for paired pre-post samples (Durlak, 2009). For binary outcomes, we present the *N*s and proportions, compare pre and post results using Mc Nemar’s chi-square estimation and present the odds ratio as an estimate of effect size.

## **Results**

### **Efficacy of OpenMinds**

#### **University medical students**

In university medical students post intervention, we found significant positive effects for all but one mental health literacy components (Table 2). Of the outcomes that showed statistically significant changes, we observe large effect sizes for social distance, knowledge, confidence in disorder identification, helping others and teaching efficacy, although given the small sample size in these analyses, the confidence intervals around the odds ratios were large (Chen, Cohen, & Chen, 2010). We did not see a significant effect of the intervention on helping attitude (possibly due to a ceiling effect whereby 88% of responses were correct prior to the

intervention, improving to 94% post intervention). We observed a significant increase in university students' perceived teaching efficacy and did not see a significant change in their interest in taking up psychiatry.

*<Table 2 around here>*

### **School students**

We observed significant improvements in all components of mental health literacy, with the exception of social distance (Table 3). Of the continuous outcome measures, the largest change was observed for non-stigmatising attitudes ( $t=4.13$ ,  $p<.001$ ), followed by knowledge and helping attitudes. There was a 10% increase in the number of students identifying the difficulties described in the vignette as being serious. Effect sizes for the significant mental health literacy outcomes were small (Cohen's  $d$  from 0.21 to 0.29 and OR of 2.25) (Chen et al., 2010).

*<Table 3 around here>*

### **Acceptability**

Three quarters of school students strongly agreed or agreed that they enjoyed the OpenMinds workshops, 73% liked being taught by a university student, 67% would recommend OpenMinds to other students and 87% said they learned something new about mental health in the workshops (Table 4).

*<Table 4 around here>*

## **Discussion**

We present preliminary evidence for the effectiveness of OpenMinds for improving mental health literacy among both university and school students. OpenMinds was acceptable with the majority of school students reporting that they liked being taught by a university student and enjoyed the OpenMinds workshops.

The impact of the programme on university students included improvements in disorder identification, their confidence in identification and helping others, attitudes, knowledge and social distance. There was no significant improvement in helping attitudes, both in terms of helping others or helping themselves. Although this might reflect a ceiling effect, future efforts on improving the programme might focus on increasing the emphasis placed on helping and help-seeking behaviours. Consistent with other evaluations of short mental health education workshops in schools (Chisholm et al., 2016; Pinfold et al., 2003), the positive impact of the programme in school students is small in terms of effect sizes. However, that significant positive effects are observed after just two sessions in schools supports wider efforts to introduce mental health education across the school years (PSHE Association, 2015). In terms of the elements of mental health literacy assessed in school students, there was no change observed in social distance, this is similar to findings reported from another mental health education programme in English secondary schools using the same measure (Pinfold et al., 2003).

The self-perceptions of confidence and ability of the medical students to communicate about mental health to school students, was shown to be significantly improved by participating in the programme. Although self-perceived teaching efficacy does not necessarily equate to high quality teaching, teachers who feel prepared to teach are more likely to do so effectively with a sense of efficacy considered a key element of effective teaching (Henson, Kogan, & Vacha-Haase, 2001). In addition, the General Medical Council in the UK regards teaching as a key skill for doctors and in qualitative feedback, OpenMinds students have been very positive about this aspect of the programme. Future evaluations of the programme could also include objective third party assessment of teaching quality and how this relates to confidence in teaching ability.

Apart from the increase in mental health literacy, other benefits of the programme include the opportunity for university and school students to interact and the confidence and skills gained by the university students in communicating and teaching. The programme

primarily involved medical students, however, as the programme adapts and expands to different universities there has been a recognition that university students from other degrees could benefit from and contribute to OpenMinds.

In the UK over recent years, there has been a crisis in recruitment of postgraduate medics into psychiatric training (Brockington & Mumford, 2002; Mukherjee et al., 2013). In response to this, OpenMinds aimed to increase university students' interest in pursuing careers in mental health. Our results suggest we did not achieve this, however it would be interesting to follow-up what specialisations university students choose later in their medical careers. In this respect it is important to note that these are a self-selected group of medical students and it is probable that they have higher than average interest in mental health and psychiatry. In addition, within the context of the current expansion of the OpenMinds model to include non-medical university students that we discuss in the previous paragraph, this aim relating specifically to Psychiatry recruitment will be less widely applicable.

The study is limited by the lack of a randomised control design and hence in our ability to conclude that observed changes in study outcomes were entirely due to OpenMinds. However, it is likely that observed effects are the result of the OpenMinds workshops because it is unlikely students received relevant information or training from other sources during the short period of the programme. Another limitation is the moderate response rate in the school sample, however this is unlikely to bias the sample results because reasons for exclusion from the study (i.e. absenteeism from school and from the classroom during the workshops due to other activities in the school) were largely not related to study outcomes. The school sample were urban and had higher proportion of males and ethnic minorities than the national average, the generalisability of these findings to a wider range of schools and settings is limited. The measures used in this study, although taken from other studies of mental health literacy and programme evaluations in these age groups, have undergone limited psychometric testing and

their associations with actual changes in behaviours and attitudes is not established. In addition, we do not have data from a longer term follow-up, hence we are unable to say whether the effects of programme result in lasting positive effects on stigmatising attitudes and knowledge; evidence from other studies suggest that some positive effects are observed 6 months after the intervention (e.g. Pinfold et al., 2003). Given that this study focused exclusively on knowledge and attitude outcomes, one focus of future work investigating mental health literacy and this programme could be the evaluation of impact on behavioural outcomes (e.g. rates of students seeking help from mental health support services within schools).

Many peer-delivered interventions exist to promote young people's health, however very few of these have been developed and designed by young people themselves (Harden et al., 1999). Engaging youth in the development and delivery of interventions can lead to more relevant and sustainable approaches. The design and approach of the model although structured and standardised to the extent of programme goals, curriculum and format, allows for flexibility and creativity in how each session is delivered. However, this also has its drawbacks in terms of standardisation and manualisation of the intervention by reducing the generalisability of findings when the intervention is delivered by other students. A future controlled trial of OpenMinds incorporating a rigorous process evaluation will help to confirm the findings and clarify which elements are central to the efficacy of the programme.

OpenMinds has been running for seven years at almost no cost. At all universities, mental health professionals volunteer their time to deliver Crash Course seminars. At UCL there is a small cost for the Classroom Training covered by the university, however at ICL and KCL Classroom Training is facilitated by volunteers. The low-cost and sustainable design of the programme combined with its potential reach in terms of numbers of young people (both university and school students) supports further expansion of the programme in the UK. Using peers or similarly aged young people to deliver mental health education offers a potential

solution to the problems of limited resources: training peer volunteers could increase capacity for scaling up mental health education and may be more cost-effective than existing interventions. Future work is necessary to robustly test these possible avenues using randomised design, with both treatment as usual controls and also comparisons with teacher or third party delivered programmes, such as have been conducted with peer-led sex education programmes (Stephenson et al., 2008).

Although a continuous mental health curriculum throughout the school years is arguably the best way to provide education about mental health to young people (Schachter et al., 2008), in the UK education around mental health is not yet a mandatory part of the curriculum and teachers feel under-prepared to communicate about this topic with their students given their limited training on mental health issues (Harland et al., 2015; Koller & Bertel, 2006). A small proportion of schools report providing mental health education to their students (Patalay et al., 2017), and lack of trained staff and funding constraints are reported as the main barriers to providing mental health support in schools (Patalay et al., 2016). Within this context, programmes such as OpenMinds provide a sustainable and peer-led approach to increasing the mental health literacy of young people.

### **Implications and contribution**

In conclusion, this study describes the protocol and provides the preliminary evidence for the efficacy and acceptability of a university student designed and facilitated mental health literacy programme. The programme benefits two groups of young people – school students and university students – at risk of mental health problems and low access to help and services. OpenMinds is therefore a promising sustainable and low cost solution to the current shortage of mental health education in UK schools and would benefit from future investigation into its efficacy via a randomised trial.

### **Compliance with Ethical Standards**

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**Declaration of interest.** KC co-founded the programme and KC, MP, TR and RN have been involved in the running of the programme at their universities. No other authors have any conflicts of interests to declare.

**Ethical Approval.** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed consent.** Informed consent was received from all participants included in the study.

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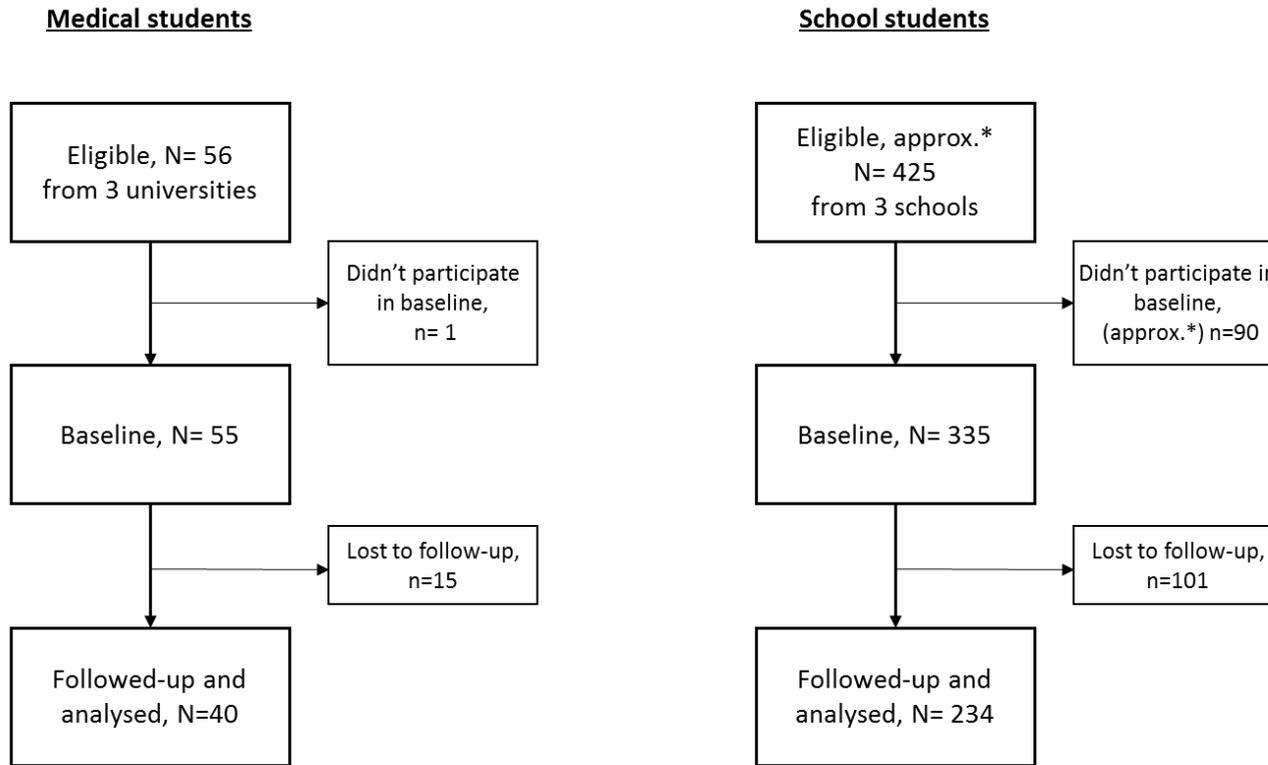
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Figure 1. showing the number of participants at baseline and follow-up in the medical and school student samples



\*these numbers were not systematically tracked during the study and are estimates based on number of school students expected to have been eligible

Table 1. Comparisons of participants lost to follow-up and those with both pre and post-scores on demographics and key outcome measures at baseline. *Note: there were no significant differences between the two groups in both samples.*

	University medical students		Schools students	
	Sample with pre and post (N=40)	Sample lost to follow-up (N=15)	Sample with pre and post (N=234)	Sample lost to follow-up (N=101)
Gender (%female)	65%	80%	36.6%	30%
Age Mean(SD)	20.97 (3.06)	20.40 (2.20)	14.0 (0.74)	14.1 (0.65)
Helping attitudes Mean(SD)	0.88 (0.17)	0.85 (0.13)	0.76 (0.25)	0.77 (0.24)
Non-stigmatising attitudes Mean(SD)	4.48 (0.34)	4.40 (0.26)	0.51 (0.27)	0.46 (0.26)
Social distance Mean(SD)	2.30 (0.69)	2.34 (0.65)	1.76 (0.60)	1.82 (0.69)
Knowledge Mean(SD)	0.45 (0.20)	0.48 (0.18)	0.28 (0.24)	0.26 (0.21)

**Table 2.** Pre and post scores and change estimates in university medical students

	<b>Pre- scores</b>	<b>Post- scores</b>	<b>Statistical test</b>	<b>Effect size</b>
<b><i>Binary outcome variables</i></b>	<i>N (%)</i>	<i>N (%)</i>	<i>Chi-square</i>	<i>Odds ratio (95% CI)</i>
Disorder identification <sup>+</sup>	31 (77.5%)	40 (100%)	9.00*	19 (1.1, 326.4)
Confidence in identification <sup>+</sup> <i>N(%)</i>	16 (40%)	37 (92.5%)	18.18**	43 (2.6, 709.7)
Ask for help themselves <sup>+</sup> <i>N(%)</i>	24 (60%)	31 (77.5%)	4.45	4.5 (0.97, 20.83)
Confidence in helping others <sup>+</sup> <i>N(%)</i>	9 (22.5%)	29 (72.5%)	20.00**	41 (2.48, 677.8)
<b><i>Continuous outcome variables</i></b>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Paired t-test</i>	<i>d</i>
Helping attitudes	0.88 (0.17)	0.94 (0.14)	-1.65	-0.33
Non-stigmatising attitudes <i>Mean(SD)</i>	4.48 (0.34)	4.69 (0.27)	-4.82**	-0.61
Social distance <i>Mean(SD)</i>	2.30 (0.69)	1.72 (0.67)	4.71**	0.85
Knowledge <i>Mean(SD)</i>	0.45 (0.20)	0.61 (0.16)	-5.79**	-0.85
Teaching efficacy <i>Mean(SD)</i>	2.91 (0.77)	4.47 (0.54)	-10.57**	-2.03
Interest in psychiatry <i>Mean(SD)</i>	5.68 (1.54)	5.89 (1.59)	-0.84	0.14

<sup>+</sup> binary outcome variables, where statistical test is McNemars chi-square and effect size is a pair matched odds-ratio. \*p<.01, \*\* p<.001

**Table 3. Pre and post scores and change estimates in school students**

	<b>Valid N</b>	<b>Pre</b>	<b>Post</b>	<b>Statistical test</b>	<b>Effect size</b>
<b>Continuous outcome variables</b>					
		<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Paired t-test</i>	<i>d</i>
Knowledge	232	0.28 (0.24)	0.35 (0.27)	-3.64**	-0.28
Non-stigmatising attitudes	233	0.51 (0.27)	0.59 (0.28)	-4.13**	-0.29
Social distance	227	1.75 (0.60)	1.78 (0.67)	-0.72	-0.05
Helping attitudes	214	0.76 (0.25)	0.81 (0.25)	-2.89*	-0.21
<b>Binary outcome variable</b>					
		<i>N (%)</i>	<i>N (%)</i>	<i>Chi-square</i>	<i>Odds ratio (95% CI)</i>
Identifying seriousness of mental health difficulties <sup>+</sup>	201	89 (44.3%)	109 (54.2%)	7.69*	2.25 (1.25, 4.05)

<sup>+</sup> binary outcome variable, where statistical test is McNemars chi-square and effect size is a pair-matched odds-ratio. \*p<.01, \*\* p<.001

**Table 4. Acceptability of the programme - school student responses**

	<b>N</b>	<b>% Strongly agree</b>	<b>% Agree</b>	<b>% Neither agree nor disagree</b>	<b>% Disagree</b>	<b>% Strongly disagree</b>
I enjoyed the lessons by OpenMinds	215	17.7	57.2	20.0	3.7	1.4
I liked being taught by university students	213	21.1	52.1	24.4	1.4	0.9
I would recommend OpenMinds to other students	215	20.0	47.4	27.0	4.2	1.4
I learned something new about mental health in these lessons	215	37.7	49.3	9.3	3.3	0.5