

The relationship between mental health self-efficacy and mental well-being in England, UK: A Cross-sectional study

Frederike Katharina Lemmel (✉ frederike.lemmel.18@ucl.ac.uk)

University College London Division of Psychiatry <https://orcid.org/0000-0002-6638-7629>

Rebecca Jones

University College London Division of Psychiatry

Sonia Johnson

University College London Division of Psychiatry

Anita Jolly

Public Health England

Miriam Miller

Public Health England

Claire Henderson

King's College London

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England, UK: A Cross-sectional study**

Authors:

Frederike Katharina Lemmel, M.Sc.
Division of Psychiatry, University College London
Maple House, 149 Tottenham Court Road
London W1T 7BN
United Kingdom

Rebecca Jones, M.Sc.
Division of Psychiatry, University College London
Maple House, 149 Tottenham Court Road
London W1T 7BN
United Kingdom

Prof Sonia Johnson
Maple House, 149 Tottenham Court Road
London W1T 7BN
United Kingdom

Dr Anita Jolly
Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
United Kingdom

Miriam Miller
Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
United Kingdom

Dr. Claire Henderson
Institute of Psychiatry, Psychology & Neuroscience, King's College London
De Crespigny Park
London SE5 8AF
United Kingdom

Abstract

Background. Mental well-being is an essential concept in research and public health as it is recognised as an indicator of population mental health and quality of life. Previous studies have provided evidence that general self-efficacy is positively related to mental well-being. The aim of this study is to examine whether higher help-seeking self-efficacy and higher psychological well-being self-efficacy respectively, are associated with increased mental well-being.

Methods. In this cross-sectional study 1795 adults from the general English population were recruited from a market research panel to fill out an online questionnaire between 24th September 2018 and 05th October 2018. Two simple linear regression analyses were used to investigate the relationship between each of help-seeking self-efficacy and psychological well-being self-efficacy as exposure variables and mental well-being as the outcome. Multiple imputation by chained equations was used to handle missing data.

Results. No evidence was found for an association between either help-seeking self-efficacy or psychological well-being self-efficacy and mental well-being.

Conclusions. These findings do not provide evidence that improving help-seeking or psychological well-being self-efficacy could lead to improving well-being. Methodological limitations, such as unmeasured confounders might be responsible for the lack of evidence in this study. Having a mental health condition is a potential negative confounder that might not have been measured adequately.

Key words: Mental well-being, help-seeking, self-efficacy, psychological well-being

The relationship between mental health help-seeking literacy and mental well-being in England,
UK: A cross-sectional study

Background

Mental well-being is an important concept in public health research and has moved into the focus of national and international policy decisions (1; 2) as it is one aspect of quality of life (3).

Although many attempts have been made to define mental well-being, no consistent definition has yet been agreed upon (4). Researchers commonly associate mental well-being with positive emotions, meaningful experiences in life and life satisfaction (5). However, it is yet understudied (6).

The interrelationship between well-being and mental health is complex (7) The World Health Organization (8) recognises the fundamental role that well-being plays in mental health by defining mental health as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community”. Mental well-being, measured using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), has been shown to have a negative association with both anxiety and depressive symptoms and a positive association with beneficial psychosocial working conditions (9).

Previous research has demonstrated that improving self-efficacy is associated with increased general health promoting behaviours (10; 11). Self-efficacy is defined as “the belief in one’s capabilities to organise and execute the courses of action required to produce given attainments” (12). One study provides evidence that higher general self-efficacy is related to higher mental well-being as well as physical well-being in employees in China, with the association being stronger between self-efficacy and mental well-being (13). Another study

found that self-efficacy together with gender and mindfulness predicted well-being in American undergraduates (14). The results of another study, conducted on a sample of dementia caregivers, suggest that self-efficacy may function as a mediating variable between social support and depressive symptoms (15).

However, no study to our knowledge specifically investigates the relationships between mental health specific self-efficacy and mental well-being. Self-efficacy specific to mental health covers both help-seeking self-efficacy and psychological well-being self-efficacy. We refer to help-seeking self-efficacy here as derived from the construct mental health literacy, that was coined by Anthony Jorm and colleagues in 1997, referring to “knowledge and beliefs about mental disorders which aid their recognition, management or prevention” (16, p. 182). In a recent scoping review of mental health literacy measures, the authors conceptualised mental health literacy to cover the four constructs: “1) understanding how to obtain and maintain good mental health; 2) understanding mental disorders and their treatments; 3) decreasing stigma against mental illness; and 4) enhancing help-seeking efficacy” (17, p.2). Psychological well-being self-efficacy refers to self-perceived abilities to implement health promoting behaviours to improve psychological well-being (18). It was proposed by Becker, Stuijbergen, Oh and Hall in 1993 in the course of developing the Self-Rated Abilities for Health Practices Scale, an instrument to measure perceived self-efficacy for different health-promoting factors (18).

Previous studies of self-efficacy and mental health often investigate specific groups using a small sample size. Previous research also does not specifically target mental well-being despite the public health importance of this construct (8) and its use to indicate population mental health (9). The aim of this study therefore is to examine the relationship between mental well-being and mental health specific constructs of self-efficacy in a large sample of the English general

population. We hypothesised that better help-seeking self-efficacy and psychological well-being self-efficacy are each associated with higher mental well-being in adults. This hypothesis is based on the previously presented research on the association of higher self-efficacy and increased health-promoting behaviours.

Methods

Study design and setting

In this secondary analysis of cross-sectional data, we followed the guidelines of the STROBE checklist for cross-sectional studies. We used data from the evaluation of the pilot of the *Every Mind Matters* campaign, delivered by Public Health England from 24th September 2018 to 05th October 2018 in the Central TV Region covering the Government Office Regions of the East and West Midlands.

The *Every Mind Matters* campaign is a government initiative intended to improve mental health literacy among the adult population in England. It is a multi-platform, social marketing programme that was created by Public Health England. The campaign aims to distribute a range of information, including printed and digital resources.

Participants

Participants were online panellists, who were recruited by the market research organisation Kantar Profiles by drawing a quota sample from a pre-existing panel maintained by Kantar Profiles. Potential participants were sent an e-mail to complete the questionnaire and were compensated with a small incentive after completion.

Measures

Participants were sent an online self-report questionnaire that comprised demographic questions such as age, gender, socio-economic group, region, long-term mental health condition, marital status, whether participants have children younger than 16 years old, smoking status and ethnicity. Additionally, the questionnaire included measures to assess mental health help-seeking literacy, psychological well-being self-efficacy, mental well-being, generalised anxiety disorder, depressive mood and desire for social distance. Those were included in the statistical model.

The four-item help-seeking self-efficacy subscale of the Mental Health Literacy Scale (MHLS) was used to measure help-seeking self-efficacy in mental health. The MHLS is a 35-item measure, which assesses all attributes of mental health literacy (19). The response categories are organised on a 5-point Likert-scale, ranging from *Strongly Disagree* to *Strongly Agree* (19). The MHLS has shown internal consistency, reliability and content validity (20). The answer categories per participant are added up to create a score on the help-seeking self-efficacy subscale which is continuous and ranges from 4 to 20, with a higher score indicating higher help-seeking self-efficacy.

Psychological well-being self-efficacy was measured using the psychological well-being subscale of the self-rated abilities for health practices scale (SRAHP). This subscale contains seven items, measuring the self-perceived ability to apply health-promoting behaviours on a 5-point Likert-scale ranging from *Not at all* to *completely* (18). The scores on the psychological well-being subscale range from 0 to 28 with higher scores indicating higher self-efficacy for health behaviours (18).

To measure mental well-being, we used the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), which was developed to monitor mental well-being in the general population and investigate the effectiveness of campaigns, programmes or projects (21). The WEMWBS is a 14-item scale with five answer categories, which are summed and provide a total score ranging from 14 to 70, with a higher score indicating better mental well-being (22). This scale has shown good content validity (21). Internal consistency measured as Cronbach's Alpha in a UK population sample was 0.91 and test-retest reliability in a student sample at one week was 0.83, which also indicates a high reliability (21).

Whether or not participants were living with a long-term mental health condition was assessed using a binary variable.

Measures used as covariates

The Generalized Anxiety Disorder 2-item (GAD-2) is used to screen for generalised anxiety disorder (23). It is the short version of the Generalized Anxiety Disorder 7-item (24) and consists of two questions answered on a 4-point Likert-scale (23). The scores for each question are summed and a higher result indicates higher anxiety (23).

The Patient Health Questionnaire 2-item (PHQ-2) (25) consists of the first two items of the Patient Health Questionnaire 9-item (26) and enquires about the frequency of depressed mood and anhedonia over the last two weeks on a 4-point Likert-scale. A higher score indicates more frequent depressive symptoms (25).

To measure desire for social distance we used the intended behaviour subscale of the Reported and Intended Behaviour Scale (RIBS) (27), which consists of four items using a 5-point Likert-scale (27). The questions cover whether individuals are willing to live with, work, live nearby or continue a relationship with someone experiencing a mental health problem (27). The total score is calculated by adding scores for each item; a higher score indicates less desire for social distance (27).

Statistical Methods

We explored relationships between self-efficacy and mental well-being using linear regression models. We first fitted separate univariable models for help-seeking self-efficacy and psychological well-being self-efficacy with mental well-being as the outcome. We then fitted multivariable models for each of the two exposures, adjusting for covariates identified as potential confounders. Main analyses were performed using multiple imputation (MI) by

chained equations to account for missing data under the missing at random (MAR) assumption, which seemed plausible for our data. We identified variables associated with missingness from the literature and in our sample and used these as auxiliary variables in the MI in order to better meet the MAR assumption. We generated 20 imputed datasets, as recommended for up to 30% of missing data (28) and combined them using Rubin's rules (29). We performed a sensitivity analysis by repeating the main analyses on the subsample of individuals with complete data. All analyses were performed using the Stata 15 software (30).

Results

Demographic characteristics

The sample of this cross-sectional study comprised 1795 participants aged 18 to 90 years with a mean age of 47.6 ($SD = 16.7$) years 51.9 % ($n = 931$) of whom were female. Of all participants, 16 % ($n = 267$) indicated that they were living with a long-term mental health condition. The mean GAD-2 score was 1.67 ($SD = 1.76$) and the mean PHQ-2 score was 1.63 ($SD = 1.64$). Further demographic data are provided in table 1.

Table 1 about here

The mean mental well-being score in this sample was 46.4 ($SD = 10.1$), the mean help-seeking self-efficacy score was 13.8 ($SD = 3.5$), and the mean psychological well-being self-efficacy score was 15.0 ($SD = 6.3$).

We found no evidence from unadjusted linear regression models that mental well-being is associated with either help-seeking self-efficacy ($estimate = 0.03$; 95 % $CI = -0.11$ to 0.16 ; $p = 0.696$) or psychological well-being self-efficacy ($estimate = -0.01$; 95 % $CI = -0.09$ to 0.06 ; $p = 0.697$). Statistical models adjusting for potential confounders likewise did not provide any evidence of an association between mental well-being and either help-seeking self-efficacy ($estimate = 0.01$; 95 % $CI = -0.13$ to 0.15 ; $p = 0.867$) or psychological well-being self-efficacy ($estimate = -0.04$; 95 % $CI = -0.12$ to 0.04 ; $p = 0.332$) (Table 2).

Table 2 about here

Sensitivity analysis

The simple linear regression analyses that we performed following the complete case-analysis approach were similar to the analyses that were conducted using the multiple imputed datasets as described above. The results of the sensitivity analyses are presented in table 3. Thus, still no evidence for an association is provided after complete-case analysis.

Table 3 about here

Discussion

Key results

Our findings provide no evidence in favour of the hypotheses that there are associations between each of help-seeking self-efficacy or psychological well-being self-efficacy and mental well-being. After adjusting for demographic and clinical characteristics there was still no evidence for either hypothesis. Previous research has suggested that increasing self-efficacy can improve health promoting behaviours (10; 11) and that higher self-efficacy was related to increased mental well-being (13; 14; 15). However, the sample sizes of these studies were considerably lower than our sample size and they targeted specific populations such as Chinese employees (13), college students (14) or caretakers for people living with dementia (15). Accordingly, the association might not show in a larger sample or might not translate to a sample of the general population. Furthermore, said studies used measures of general self-efficacy rather than measures of mental health related self-efficacy. Thus, the expected association might not hold. Previous studies have also shown, that experience of mental ill-health is associated with higher mental health literacy (19; 31; 32; 33), which might act as a negative confounder (as explained in *Strengths and Limitations*). Regarding mental ill-health experiences, we have to consider that insufficient information might have been collected in the current study, as the long-term mental health condition variable might exclude some groups of people with current or past experience of mental health problems, who do not self-identify as having a long-term condition or screen positive on the measures of anxiety and depression included. Additional considerations are, that the variable might be subject to recall bias and the missing data might influence the results as explained earlier.

Another explanation for the lack of association might be that the concept of self-efficacy might not have a large effect on mental well-being. That is because it assumes, that if you act on your mental health problems, this can improve your mental well-being. However, for many individuals, social determinants such as poor financial situation, low educational level, unemployment, social isolation and access to treatment are associated with poor mental health and poor mental well-being (34; 35). Of these factors, only socio-economic group was assessed and included in the adjusted analyses of the current study. Thus, important determinants for mental health and mental well-being, that could overshadow a possible association between self-efficacy and mental well-being, might not have been considered.

Strengths and limitations

This cross-sectional study has some important strengths. Firstly, this is the first study to our knowledge to specifically investigate the association between different constructs within self-efficacy and mental well-being in a large sample of the general population in England. Secondly, the large sample size of 1795 participants increased the power of the statistical analyses (36). Thirdly, we used multiple imputation to handle missing data in all variables with missing data. The analyses based on multiple imputation and the complete case-analyses provide similar results. This limits the probability that the results obtained are different than those that would have been obtained from a dataset without missing data (37). With 7 % of observations being missing, most data were missing in the long-term mental health condition variable ($n = 118$). Compared to similar cross-sectional studies, this small quantity of missing data decreases the probability that wrongly imputed data could have affected the results of the analyses, even in case we assumed the wrong missingness mechanism (37). Furthermore, non-response and missing data are problems that can affect cross-sectional studies and can result in bias (38). This

is especially a problem when demographic characteristics of non-responders differ from responders (39; 40). Participants that answered key demographic questions (such as age, gender, occupation, place of residence) with “Prefer not to say” were excluded from further participation. This was done to ensure that demographic information is available, to fill the quotas and ensure that groups that tend to be underrepresented are covered better.

Lastly, another strength of the current study is that the scales that were used to measure relevant constructs such as help-seeking self-efficacy, mental well-being and psychological well-being self-efficacy are validated measures that have been widely used in mental health research (18; 19; 21). This supports the validity of our analyses and allows our results to be compared to other studies that utilised the same measures.

There are also methodological limitations to be considered. The questionnaire might not have included appropriate measures for the covariate long-term mental health condition, because it was only one question with a binary answer category. This question might be prone to be abnegated by participants who experience briefer periods of mental ill-health or who have recovered. Adding to that, the question might be sensitive to recall bias, which can occur in retrospective research when a participant is asked to provide self-report information about his or her past (41). Another difficulty concerning this variable is that the values are missing for 118 participants, which accounts for approximately 7 % of the sample and makes it the variable with most missing values. We attempted to tackle this potential source of bias by performing multiple imputation, on the basis of which we conducted the regression analyses (37). This approach has the advantage that it can provide unbiased and valid estimates (42). However, there remains a potential risk that we assumed the wrong missingness mechanism and the occurrence of missing data is depending on variables that have not been measured (43). As previous studies have

demonstrated that experience of mental ill-health is associated with mental health literacy (19; 31; 32; 33), and we used a subscale of the MHLS to measure help-seeking self-efficacy, lived experience of mental illness is an important potential negative confounder. A negative confounder can lead to an underestimation of the observed effect (44). While we controlled for current symptoms of common mental disorder, this still leaves the possibility of missing people with one or more previous experiences of mental ill health that they did not consider a long term condition.

Another possible methodological limitation concerns the subscale of the MHLS that was used in this study to measure help-seeking self-efficacy. This subscale consists of only four questions thus it might complicate differentiation between participants (19).

Furthermore, there might have occurred a sampling bias, because people who partake in online market research studies are likely to be more interested in the respective topic of the study (45). This means, that although the quota sample is representative in terms of measured demographics, it might be not representative regarding characteristics that have not been measured. Although the development study of the MHLS provides a mean value for the overall MHLS, the mean values for the subscales are not provided (19). Due to this, scores of this study to the general population and evaluate whether the sample is representative regarding their mental health literacy. Furthermore, a quota sample was used in the current study. The results of a study that was conducted using a quota sample are not as generalisable to the general population as a random sample because the quota have to be set in advance, and it is not a probability sampling technique (46). The sample characteristics that have just been described can affect the representativeness of the sample (47), but since this cross-sectional study does not investigate prevalence rates (but associations) this is not thought to bias the results.

Secondly, there are some practical limitations that need to be considered. One limitation concerns the nature of mental well-being. Mental well-being is not a stable construct, but rather a reflection of the current state that the individual is in (1). Thus, the attempt to measure mental well-being at a single time point, as done in this study, might not be appropriate to receive an accurate estimate.

Conclusions

Due to the large mental health treatment gap, the stigmatising attitudes that are associated with mental ill-health and the mental well-being challenges that many individuals face, improving mental well-being has become an essential aim in public health and policy making (5). The importance of improving mental well-being has even been recognised internationally by the World Health Organization (8). However, it has to be considered that many factors can have an influence on mental well-being. Public health policy makers should acknowledge that self-efficacy might follow the “neither necessary nor sufficient nor acting alone” approach that we observe with many determinants in mental health (48). The evidence-base for the importance of improving self-efficacy in public health has not been investigated sufficiently, but future public health initiatives should consider other mental well-being determinants when making policy decisions to improve mental well-being. Those can include social determinants such as financial situation, educational level, unemployment and social isolation, which have shown to be associated with mental health and mental well-being outcomes to a greater extent (35).

Future research.

Since we cannot rule out that the lack of evidence for associations between mental well-being and self-efficacy is due to methodological limitations such as a choice of unsuitable or

shortened measures, it is crucial to conduct further research. To better measure previous experience of mental ill-health as a potential negative confounder, further research should include more thorough assessment using existing scales and diagnostic terms. Furthermore, it would be helpful to conduct a longitudinal study instead of a cross-sectional study because this would allow the researchers to draw conclusions about temporal relationships between the variables and might reduce the probability of recall bias for mental ill-health (49; 50). Social determinants (35) should be thoroughly considered in such a study.

Declarations

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Ethics approval and consent to participate

This study was given an exemption by King's College London Psychiatry, Nursing and Midwifery Research Ethics Subcommittee as secondary analysis of anonymised data.

Consent for publication

Not applicable.

Availability of data and materials

Data will be available after the end of the evaluation of Every Mind Matters on reasonable request to Public Health England

Competing interests

None

Authors' contributions

FKL analysed and interpreted the data with the support of CH and RJ. CH conceived the research question and the analysis plan. RJ supervised and supported the statistical analysis, including the methods and results sections. All authors were major contributors in writing the final manuscript.

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Table 1: Demographic characteristics of the sample (N = 1,795)

	N (%) / Mean (SD)
Help-seeking self-efficacy total – mean (SD)	13.8 (3.5)
Psychological well-being self-efficacy total – mean (SD)	15.0 (6.3)
Mental well-being total – mean (SD)	46.4 (10.1)
Gender: Female	931 (51.9 %)
Age (years) – mean (SD)	47.6 (16.7)
Long Term Mental Health condition	267 (16.0 %)
Marital Status	
Married/partnership	1057 (58.9 %)
Single	515 (28.7 %)
Widowed/divorced/separated	213 (11.9 %)
Ethnicity	
White British	1568 (87.4 %)
White Non-British	65 (3.6 %)
Mixed	36 (2.0 %)
Asian	83 (4.6 %)
Black	24 (1.3 %)
Arab	3 (0.2 %)
Socio-economic group	
Semi or unskilled manual worker	221 (12.3 %)
Skilled manual worker	313 (17.4 %)
Supervisory or clerical/junior manager	480 (26.7 %)
Intermediate managerial/professional/administrative	407 (22.7 %)
Higher managerial/professional/administrative	104 (5.8 %)
Student	32 (1.8 %)
Retired and living on state pension only	83 (4.6 %)
Unemployed/not working due to long-term sickness	112 (6.2 %)
Housewife/Househusband/Homemaker	43 (2.4 %)
GAD-2 – mean (SD)	1.67 (1.76)
PHQ-2 – mean (SD)	1.63 (1.64)
Life Satisfaction – mean (SD)	7.6 (2.1)
Region	
North East	85 (4.7 %)
North West	176 (9.8 %)
Yorkshire and the Humber	120 (6.7 %)
East Midlands	292 (16.3 %)
West Midlands	465 (25.9 %)
East of England	129 (7.2 %)
South East excluding London	224 (12.5 %)
London	145 (8.1 %)

	N (%) / Mean (SD)
South West	159 (8.9 %)
RIBS total – mean (SD)	8.8 (3.7)
Children 16 or under living with them: Yes	1350 (75.2 %)
Smoking: Yes	342 (19 %)

Notes: All statistics are counts (N) and percentages (%) unless otherwise specified. SD = standard deviation; GAD-2 = Generalized Anxiety Disorder 2-item; PHQ-2 = Patient Health Questionnaire 2-item (depressive mood and anhedonia); RIBS = Reported and Intended Behaviour Scale (desire for social distance). There were 118 missing observations (6.6%) for long term mental health condition. The quantity of missing data for all other measures was low (<1%).

Table 2: Associations with well being after multiple imputation (N = 1,795)

	Unadjusted			Adjusted		
	Estimate	95 % CI	p-value	Estimate	95 % CI	p-value
MHHL	0.03	-0.11 to 0.16	0.696	0.01	-0.13 to 0.15	0.867
Psychological well-being self-efficacy	-0.01	-0.09 to 0.06	0.697	-0.04	-0.12 to 0.04	0.332

Notes: The estimate represents the increase in well-being on the WEMWBS for a 1 point increase in the exposure variable. CI = confidence interval. The adjusted model adjusted for age, gender, region, marital status, RIBS, children, smoking status, ethnicity, socio-economic group, long term mental health condition.

Table 3: Associations with well-being in participants with complete data (N = 1,650)

	Unadjusted			Adjusted		
	Estimate	95 % CI	p-value	Estimate	95 % CI	p-value
Help-seeking self-efficacy	0.02	-0.12 to 0.16	0.796	0.02	-0.12 to 0.16	0.784
Psychological well-being self-efficacy	-0.01	-0.09 to 0.07	0.836	-0.03	-0.11 to 0.06	0.546

Notes: The estimate represents the increase in well-being on the WEMWBS for a 1 point increase in the exposure variable. CI = confidence interval. The adjusted model adjusted for age, gender, region, marital status, RIBS, children, smoking status, ethnicity, socio-economic group, long term mental health condition.

Table 4

Items of the help-seeking subscale of the Mental Health Literacy Scale

Item Number	Statement
1	I am confident that I know where to seek information about mental illness.
2	I am confident using the computer or telephone to seek information about mental illness.
3	I am confident attending face to face appointments to seek information about mental illness
4	I am confident that I have access to resources (e.g. GP, internet, friends) that I can use to seek information about mental illness

Note:

Items are the help-seeking subscale of the Mental Health Literacy Scale (18)

Table 5

Items of the Psychological well-being subscale of the Self Rated Abilities for Health Practices Scale

Item Number	Statement
1	Figure out things I can do to help me relax
2	Keep myself from feeling lonely
3	Do things that make me feel good about myself
4	Avoid being bored
5	Talk to friend and family about the things that are bothering me
6	Figure out how I respond to stress
7	Change things in my life to reduce my stress

Note:

Items are Item 8-14 (7)

Table 6

Items of the Generalized Anxiety Disorder 2-item

Item Number	Statement
1	Feeling nervous, anxious or on edge
2	Not being able to stop or control worrying

Note:

Items are taken from the Generalized Anxiety Disorder 2-item (Koenke et al., 2007) and participants were asked to indicate how often they have been bothered by the following problems in the last two weeks (Koenke et al., 2007)

Table 7

Items of the Patient Health Questionnaire 2-Item

Item Number	Statement
1	Little interest or pleasure in doing things
2	Feeling down, depressed or hopeless

Note:

Items are taken from the Patient Health Questionnaire 2-Item (Koenke, Spitzer & Williams, 2003) and participants were asked to indicate how often they had experienced the following symptoms in the last two weeks (Koenke, Spitzer & Williams, 2003)

Table 8

Intended Behaviours Subscale of the Reported and Intended Behaviour Scale

Item Number	Statement
1	In the future, I would be willing to live with someone with a mental health problem
2	In the future, I would be willing to work with someone with a mental health problem
3	In the future, I would be willing to live nearby to someone with a mental health problem

Item Number	Statement
4	In the future, I would be willing to continue a relationship with a friend who developed a mental health problem

Note:

Items are Items 5-8 (Intended Behaviours Subscale) of the Reported and Intended Behaviour Scale (26)

Table 9

Logistic regression analyses of missing data for long-term mental health condition associated with demographic characteristics

N=1795	Missing data ^a	Complete data ^b	Unadjusted analysis	
<u>Characteristic</u>	<u>n (%) / Mean</u> <u>(SD)</u>	<u>n (%) / Mean</u> <u>(SD)</u>	<u>OR (95% CI)</u>	<u>p-value^c</u>
Age (years)	44.5 (16.7)	47.8 (16.7)	0.99 (0.98 to 0.99)	0.034
Gender Female	60 (50.9%)	871 (51.9%)	0.96 (0.66 to 1.39)	0.819
SEG				
Semi or unskilled manual worker	28 (23.7%)	193 (11.5%)	1	
Skilled manual worker	18 (15.3%)	295 (17.6%)	0.42 (0.23 to 0.78)	0.006
Supervisory or clerical/junior manager	29 (24.6%)	451 (26.9%)	0.44 (0.26 to 0.77)	0.003
Intermediate managerial/professional/administrative	20 (17.0%)	387 (23.1%)	0.36 (0.20 to 0.65)	0.001
Higher managerial/professional/administrative	6 (5.1%)	98 (5.8%)	0.42 (0.17 to 1.05)	0.064
Student	1 (0.9%)	31 (1.9%)	0.22 (0.03 to 1.69)	0.147
Retired and living on state pension only	1 (0.9%)	82 (4.9%)	0.08 (0.01 to 0.63)	0.016

N=1795	Missing data ^a	Complete data ^b	Unadjusted analysis	
Unemployed (for over 6 months) or not working due to longterm sickness	9 (7.6%)	103 (6.1%)	0.60 (0.27 to 1.32)	0.207
Housewife/Househusband/Homemaker	6 (5.1%)	37 (2.2%)	1.12 (0.43 to 2.89)	0.818
<u>Characteristic</u>	<u>n (%) / Mean (SD)</u>	<u>n (%) / Mean (SD)</u>	<u>OR (95% CI)</u>	<u>p-value^c</u>
North East	7 (5.9%)	78 (4.7%)	1	
North West	9 (7.6%)	167 (10.0%)	0.60 (0.22 to 1.67)	0.329
Yorkshire and the Humber	8 (6.8%)	112 (6.7%)	0.80 (0.28 to 2.29)	0.671
East Midlands	22 (18.6%)	270 (16.1%)	0.91 (0.37 to 2.20)	0.831
West Midlands	23 (19.5%)	442 (26.4%)	0.58 (0.24 to 1.40)	0.225
East of England	8 (6.9%)	121 (7.2%)	0.74 (0.26 to 2.11)	0.570
South east excluding London	12 (10.2%)	212 (12.6%)	0.63 (0.24 to 1.66)	0.351
London	13 (11.0%)	132 (7.9%)	1.10 (0.42 to 2.87)	0.850
South West	16 (13.6%)	143 (8.5%)	1.25 (0.49 to 3.16)	0.642
Life satisfaction	6.7 (2.2)	7.7 (2.1)	0.82 (0.75 to 0.88)	<0.001
PHQ-2	2.4 (1.5)	1.6 (1.6)	0.44 (0.15 to 1.29)	0.049
GAD-2	1.7 (1.8)	1.7 (1.8)	0.76 (0.28 to 2.10)	0.566
Smoking status: Yes	42 (35.6%)	462 (27.6%)	1.56 (0.17 to 14.02)	0.677
Marital status				
Married/partnership	60 (50.9%)	997 (59.5%)	1	
Single	42 (35.6%)	473 (28.2%)	1.48 (0.98 to 2.22)	0.062
Widowed/divorced/separated	13 (11.0%)	200 (11.9%)	1.08 (0.58 to 2.00)	0.807
Prefer not to say	3 (2.5%)	7 (0.4%)	7.12 (1.80 to 28.23)	0.005
Children under 16: Yes	87 (73.7%)	1263 (75.3%)	0.92 (0.60 to 1.41)	0.700
Ethnicity				

N=1795	Missing data ^a	Complete data ^b	Unadjusted analysis	
British	100 (84.8%)	1468 (87.5%)	1	
White Other	3 (2.5%)	62 (3.7%)	0.71 (0.22 to 2.30)	0.569
Mixed	4 (3.4%)	32 (1.9%)	1.84 (0.64 to 5.29)	0.261
Asian	5 (4.2%)	78 (4.7%)	0.94 (0.37 to 2.38)	0.898
Black	3 (2.5%)	21 (1.3%)	2.10 (0.62 to 7.15)	0.237
Arab	1 (0.9%)	2 (0.1%)	7.34 (0.66 to 81.64)	0.105
Prefer not to say	2 (1.7%)	14 (0.8%)	2.10 (0.47 to 9.36)	0.332

Note:

n=Number of participants per subgroup

SD=Standard deviation

^an=118

^bn=1677

GAD-2=Generalized Anxiety Disorder 2-item

PHQ-2=Patient Health Questionnaire 2-item (depressive mood and anhedonia)

Data are n (%) for nominal data and Mean (SD) for interval data

List of abbreviations

WEMBS	Warwick-Edinburgh Mental Wellbeing Scale
MHLS	Mental Health Literacy Scale
SRAHP	Self-rated Abilities for Health Practice Scale
GAD-2	Generalized Anxiety Disorder 2-item
PHQ-2	Patient Health Questionnaire 2-item
RIBS	Reported and Intended Behaviour Scale
MI	Multiple imputation
MAR	Missing at random
SD	Standard Deviation
n	Number of participants
CI	Confidence interval