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Mental health and wellbeing of postgraduate researchers: exploring the relationship between mental health literacy, help-seeking behaviour, psychological distress, and wellbeing.

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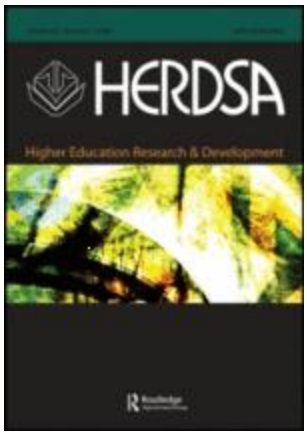

Mental health and wellbeing of postgraduate researchers: exploring the relationship between mental health literacy, help-seeking behaviour, psychological distress, and wellbeing

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Mental health and wellbeing of postgraduate researchers: exploring the relationship between mental health literacy, help-seeking behaviour, psychological distress, and wellbeing.

Studies of Postgraduate Researchers (PGRs) have highlighted that the population may be at risk of developing symptoms of common mental health problems. Early intervention and preventative measures may reduce this risk, such as improving mental health literacy (MHL). However, it is unclear what the relationship is between MHL and outcomes such as help-seeking behaviour, psychological distress and wellbeing, in PGRs. Therefore, the current study aimed to explore this relationship. A secondary aim of this study was to compare data collected from PGRs with undergraduate students (AUTHOR, 2017). Two-hundred and forty one PGRs from two universities in England completed an anonymous online quantitative survey, with PGRs reporting on their MHL (O'Connor & Casey, 2015), help-seeking behaviour (Wilson et al., 2005), psychological distress (Kessler et al., 2005), and wellbeing (Tennant et al., 2007), in addition to demographic and academic characteristics. Results indicated that 70% of PGRs were experiencing symptoms categorised as mild to severe psychological distress. Stepwise multiple regressions revealed that lower levels of wellbeing predicted higher levels of distress and lower levels of help-seeking behaviour. Compared with undergraduate students, PGRs in this study reported higher levels of psychological distress compared to undergraduate students, after adjusting for age, sex, and previous diagnosis of a mental health problem, as well as MHL, after adjusting for sex and previous diagnosis ($p < 0.05$). No significant differences were observed between the groups for help-seeking behaviour, or wellbeing (all $p > 0.05$). Study findings suggest that PGRs, at the start of the academic year, are distressed and may not be seeking appropriate help for their concerns. Further studies should explore the environmental factors that may exacerbate mental health concerns beyond that associated with a challenging degree, within the PGR population.

Key words: postgraduate researcher; mental health; psychological distress; student; mental health literacy

1. Introduction

There has been growing international concern about the mental health and wellbeing of PGRs. Research has indicated that PGRs are at increased risk of having or developing common psychiatric disorders compared with the general population or with other comparable groups. In addition, the prevalence of mental health issues may affect the quality of research outcomes. A recent survey by Wellcome on reseach culture, for example, identified work-life balance (37%) and a negative impact on wellbeing and mental health (34%) as the most common reasons for leaving a research career (Moran, Karlin, Lauchlan, Rappaport, Bleasdale, Wild, and Door, 2020). In England and Wales, these concerns prompted the Office for Students/Research England to invest £1.5million in projects to the wellbeing and mental health of PGRs. Based on data collected through one of these projects, this paper focusses on the relationship between mental health literacy, help-seeking behaviour, psychological distress, and wellbeing. It shows that, compared with undergraduate students, PGRs in this study reported higher levels of psychological distress compared to undergraduate students, and that they may be seeking help for their concerns. Mental health literacy programmes show promise in increasing the likelihood of help seeking behaviour in PGRs and aid in prevention and early identification. However, we conclude that further work is required to improve wellbeing in this population.

There is growing research evidence to suggest that doctoral researchers are at risk of developing mental health problems, and that risk is higher than for other populations. In an international sample of 2,279 doctoral researchers from 26 countries, Evans, Bira, Gastelum, Weiss, and Vanderford (2018) noted that 39% of participants reported moderate to severe symptom levels which may indicate depression, with similar levels (41%) for anxiety. Levecque, Anseel, De Beuckelaer, Van der Heyden, and Gisle (2017) in Belgium noted that one in two researchers (total $n = 3659$) experienced psychological distress and that one in three was at risk of a common mental health problem (e.g., depression). Similar results have been identified in research undertaken in Australia (Barry et al 2018) and China (Liu et al., 2019).

Researchers have noted that the risks of experiencing mental health problems is higher in comparison to other education-matched (Levecque et al., 2017) and age-matched populations (Barry, Woods, Warnecke, Stirling, and Martin, 2018) and to the general population, with Evans et al. (2018) reporting that doctoral researchers were six times more likely to experience symptoms of depression and anxiety. A variety of programme-related/environmental factors have been cited as contributing the mental health concerns of PGRs, including work-life balance and the supervisory relationship (Evans et al., 2018; Levecque et al., 2017). Such factors may represent greater pressure and demand for PGRs during the course of their studies, compared to undergraduate students (Tobbell, O'Donnell, & Zammit, 2010).

Such evidence has prompted a review of policies to support PGR mental health and wellbeing in the UK higher education sector. Mental health and wellbeing has been a key strategic priority since the publication of the Universities UUK (2018) framework, which advocates a whole university approach to mental health for all staff and students. However, institutions have focused their resources primarily on undergraduate students. Undergraduate students form the majority of the university student population in the UK (HESA, 2018), with most students at university in the UK aged 20 and under (950,090), followed by those aged 21-24 years old (637,320; ONS, 2018). Therefore, the majority of those who are studying at university in the UK are at the peak range of the onset of mental health problems, with recent estimates suggesting that three-quarters of all diagnosable mental health problems start before the age of 25 (Kessler, Berglund, et al., 2005; Kessler & Wang, 2008).

Taken together, research highlighting the mental health of PGRs, particularly doctoral researchers, has fostered conversations on how the mental health and wellbeing of PGRs may be improved. A recent report in the UK from Metcalfe, Wilson, and Levecque (2018) explored factors which can affect the mental health and wellbeing of PGRs. Through a series of focus groups, factors identified in the focus groups included clarity of expectations, lack of feedback, supervisory relationship and financial circumstances amongst others. The resulting recommendations from Metcalfe et al. (2018) tasked universities to focus on the prevention, recognition, and management of mental health problems in PGRs (e.g., signposting to mental health resources).

Such a focus also aligns with the wider policy focus for the mental health of adults in England from NHS England such as the NHS Long Term Plan (NHS, 2019).

One avenue for exploration in implementing the recommendations from Metcalfe et al. (2018) is mental health literacy (MHL). The phrase MHL, coined by Jorm et al. (1997a), is considered a 'gold-standard' definition (O'Connor, Casey, & Clough, 2014) and refers to the knowledge of and/or belief about mental health conditions that can help with their recognition, management, and/or prevention. Jorm's (1997a) definition of MHL encompasses several facets: (1) The ability to recognise different mental health conditions; (2) Knowledge of how to seek out information about mental health conditions; (3) Knowledge surrounding risk factors for developing mental health conditions; (4) Knowledge surrounding the cause of mental health conditions; (5) Knowledge of self-treatment options available; (6) Knowledge concerning the professional options for help; (7) Holding attitudes which promote the recognition of mental health conditions, and encourage appropriate levels of help-seeking (Jorm, 2000; Jorm et al., 1997a).

Research indicates that recognising mental health symptoms can improve help-seeking behaviour (Altweck, Marshall, Ferenczi, & Lefringhausen, 2015), as well as reduce stigmatising beliefs and attitudes (Kitchener & Jorm, 2004).Whilst MHL may have implications for the identification and intervention in mental health problems (Kutcher, Wei, & Coniglio, 2016; Wei, McGrath, Hayden, & Kutcher, 2015), there have also been further calls for research to strengthen the link between MHL and outcomes of interest such as the reduction of psychological distress, translation to actual help-seeking and reduction in suicidal behaviour (Dumesnil & Verger, 2009). Strengthening the link would highlight the impact that MHL could have on mental health outcomes.

In higher education, under-recognition of the symptoms of diagnosable mental health problems has been reported in undergraduate students (Furnham, Cook, Martin, & Batey, 2011).

Studies have highlighted that improved MHL is associated with higher levels of help-seeking behaviour (intent to seek help) in undergraduate students (O'Connor & Casey, 2015; AUTHOR 2017).

In addition, help-seeking behaviour is associated with a reduction in psychological distress and improved wellbeing for undergraduate students, possibly indicating a mediating relationship between MHL and these outcomes via help-seeking behaviour (O'Connor & Casey, 2015; AUTHOR, 2017). Furthermore, a programme of MHL in undergraduate students is reported to: (1) improve self-reported mental health knowledge; (2) reduce stigma; (3) increase help-seeking behaviour (Hunt, Wei, & Kutcher, 2019).

It is unclear what the relationship is between MHL and outcomes such as help-seeking, and mental health indicators such as psychological distress and wellbeing in the PGR population. Moreover, no published research has reported on the relationship between MHL, help-seeking, psychological distress and wellbeing in UK-based PGRs, as previously published studies have focused on undergraduate students. Given the potential for MHL to have a role within the identification and prevention of mental health conditions and combined with reports that PGRs are distressed and at risk of developing a diagnosable mental health problem, the MHL literacy of PGRs should be examined.

The first aim of this study was to explore the relationship between MHL, help-seeking behaviour, psychological distress and wellbeing, among PGRs studying at two universities in England. The second aim of this study was to compare the data collected (MHL, help-seeking behaviour, psychological distress and wellbeing) from PGRs with undergraduate students from a study utilising similar methods (AUTHOR, 2017). Such a comparison would elucidate whether further support needs to be targeted towards PGRs specifically.

This study has two hypotheses:

(1) MHL would correlate with, and predict, help-seeking behaviour (positively correlated), wellbeing (positively correlated) and psychological distress (negatively correlated).

(2) PGRs would report higher levels of psychological distress and lower levels of wellbeing compared to undergraduate students from AUTHOR (2017).

2. Methodology

2.1 Participants: current study

The current study was based in two UK-based universities which were partners in an Office for Students/Research England funded project to explore the mental health and wellbeing of PGR students. This project built on an existing collaboration between the two institutions on mental health in education, which had focussed on facilitating evidence-based interventions and resources for vulnerable groups of students. Both universities were teaching focussed, one based in the North of England (NorthU) and one in the South (SouthU). The universities had similar total student numbers of approximately 24,000, and similar PGR numbers (SouthU n = 771, NorthU n = 681).

All registered PGRs at both universities were invited to complete an online and anonymous, quantitative survey, which was administered using Qualtrics (Qualtrics, 2018). The survey was available for six weeks between October-November 2018. There were 241 responses (SouthU n = 201, NorthU n = 39, university not reported n = 1), representing an overall response rate of 17% (SouthU = 26%, NorthU = 0.06%). Differences in response rates was explained by the different recruitment strategies used by the two universities. NorthU relied on email only, but SouthU supplemented this with in-person recruitment at workshops and inductions by members of the project team. Ethical approval for the study was granted by the University Ethics Committee and survey request groups at both universities.

2.2 Participants: comparison group

The data collected from the current study were compared to data collected from undergraduate students by AUTHOR (2017), due to the similar methodology between the two studies (outlined in section 2.3). Similar methodologies enabled a comparison between the different student populations across both studies and whether targeted support may be needed for PGRs.

2.3 Instruments

The mental health and wellbeing of PGR students was assessed using the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) (Tennant et al., 2007) and the Kessler Psychological Distress Scale (K-10) (Kessler et al., 2002). Intention to seek informal (e.g., friends and family) and formal (e.g., GP) sources of help was assessed via the General Help Seeking Questionnaire (GHSQ) (Wilson, Deane, Ciarrochi, & Rickwood, 2005), and MHL was assessed via the Mental Health Literacy Scale (MHLS) (O'Connor & Casey, 2015). All questionnaires in the current study were also used by AUTHOR (2017), which enabled a comparison between the two data sets.

The questionnaires used within the survey were reliable and valid, with the following psychometric characteristics reported in the original manuscripts: the internal consistency (Cronbach's Alpha) for all questionnaires was high (MHLS = 0.87; GHSQ = 0.70; K-10 = 0.92; WEMWBS = 0.89 for student samples, and 0.91 for population), as was test re-test reliability (MHLS = 0.79, over two weeks; GHSQ = 0.86, for personal-emotional subscale over three weeks; WEMWBS = 0.83). For the K-10, the scale is able to discriminate between those who have diagnosable mental health conditions ('cases' according to DSM-IV/SCID diagnostic criteria), and those who do not ('non-cases') (Kessler, Chiu, Demler, & Walters, 2005). Demographic data was also collected and encompassed personal (age, sex, gender, sexual orientation, ethnicity, caring responsibilities, marital status, previous diagnosis of mental health problems, diagnosed mental health problems in friends and/or family), as well as academic (university, school/department, year of study, mode of study, fee status, type of course) characteristics.

2.4 Data processing

Total scores were computed for all questionnaires included in the current study. In addition, four categories of psychological distress were calculated according to scoring criteria from Andrews and Slade (2001)from low (10-15), moderate (16-21), high (22-29), and very high (30-50). The scoring criteria used in the current study has also been used in recent Victorian Health Population Surveys in Australia (DHHS, 2018). Other demographic categories were collapsed to increase sample size. The collapsed demographic categories were: sexual orientation (heterosexual/straight (n = 192) vs. LGBT+ (n = 37)), ethnicity (White (n = 184) vs. Black Asian and Minority Ethnic (BAME) (n = 50)), and caring responsibilities (none (n = 168) vs. caring responsibilities (n = 69)). For the data comparison between the current study and AUTHOR (2017), the data sets were merged. Forty-nine cases were removed from the AUTHOR (2017) data set, as this contained Masters and PhD researchers, leaving a total sample size of 330. Cases from the comparison data set were removed as this was collected over a number of months, rather than in the first term of the academic year. All data from the current study was included in the comparison, leaving a total sample size of 241.

2.5 Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics version 24 (SPSS, Inc., Boston, Mass., 2016). Data were checked for assumptions of parametric tests, and the appropriate non-parametric test was applied if assumptions were violated. All analyses were two-tailed, with α set at 0.05. Behavioural outcome measures (total scores from all questionnaires) were analysed using an independent t-test or Mann Whitney U if demographic characteristics were limited two groups. Linearity was confirmed (Spearmans (rs), using total scores for all questionnaires) before regressions were conducted.

For the data comparison between the current study and undergraduate students AUTHOR (2017), data were analysed using univariate ANCOVA, with age, sex and previous diagnosis of a mental health problem selected as covariates. Covariates were included in the model where significant and removed where non-significant. The total scores from all questionnaires were the dependent variables, with group as the fixed factor. Bonferroni post-hoc tests were examined for significant main effects.

To understand the predictive relationship of individual differences on MHL, help-seeking behaviour and mental health outcomes (psychological distress and wellbeing), multiple linear regressions (using the Stepwise method) were performed. To enable variables which including 3 + sub-groups (e.g., sexual orientation) to be included in the regression models, variables were dummy coded. The selected individual differences variables of interest were: age, sex, sexual orientation, ethnicity, self-reporting mental health problem, self-reporting mental health problem in others (friends/family), caring responsibilities, fee status, mode of study, marital status, and year of study. Total scores from the questionnaires were selected as both dependent variables and predictors (this varied per model). Outliers (+3 SD from mean) were removed from analyses on a case-by-case basis and removed until no further outliers remained. The data presented in the current study is with outliers removed. Data assumptions for multiple regressions were met (e.g. independence of data, type of predictor, no evidence of multicollinearity).

3. Results

3.1 Sample characteristics

Of the participants in who took part in the survey, 66% of the sample were female, 80% were heterosexual, 96.3% had a gender identity consistent with their biological sex, 76.4% were Caucasian, 38% were married, 69.7% did not have caring responsibilities,

68.5% did not have a self-reported mental health problem, and 79.3% knew someone (family and/or friend) who have a diagnosed mental health problem (Table 1). Academically, 59.8% of PGRs in the sample were studying full-time, 42.3% were in their first year of study, 83.4% were categorised as Home/EU students, and 80.5% were completing a PhD (Table 2). With regard to distress, the majority of the participants who took part in the survey were experiencing mild-severe non-specific psychological distress (70%), with 10% classified as experiencing low levels of psychological distress, 22% as moderate, 31% as high, and 17% as very high (missing % = 20%).

Table 1

Demographic characteristics for PGRs (includes MPhil/MRes).

Demographic characteristics		***n*** **(total = 241)**
Sex	Male	80
	Female	159
	Other	1
	Prefer not to say	1
Gender identity	Yes	232
	No	5
	Prefer not to say	4
Sexual orientation	LGBT+ *	37
	Heterosexual/straight	192
	Missing	29

Marital status	Cohabiting	57
	Divorced or in a civil partnership dissolved	10
	In a civil partnership	4
	Married	91
	Separated (but still legally married or in a civil partnership)	4
	Single (never married or never in a civil partnership)	68
	Widowed or a surviving partners from a civil partnership	3
	Prefer not to say	4
Caring responsibilities	Yes*	69
	No	168
Ethnicity	BAME*	50
	White	184
Diagnosed mental health condition (individual)	Yes	71
	No	165
	Prefer not to say	5

Diagnosed mental health condition (family and/or friend)	Yes	191
	No	44
	Prefer not to say	6

* *Note* Collapsed variables with multiple categories.

Table 2

Academic characteristics for PGRs (includes MPhil/MRes).

Academic characteristics		***n* (total *n* = 241)**
Type of degree	MPhil	2
	MRes	10
	PhD	192
	PhD by publication (or Existing Published Work)	2
	Professional Doctorate	34
	Doctor of Medicine	1
Mode of study	Full-time	144
	Part-time	96
	Missing	1
Fee status	Home/EU	201

	International	40
Year of study	First	102
	Second	55
	Third	41
	Fourth+ *	41
	Missing	2

3.2 Psychometric characteristics of study questionnaires

Responses were normally distributed for the GHSQ and WEMWBS (all $p > 0.3$), but not for the MHLS, or K-10 (all $p < 0.001$). A high degree of internal consistency (Cronbach's Alpha – α) was observed for the MHLS (0.883), K-10 (0.911), and WEMWBS (0.910), but not for the GHSQ (0.502).

3.3 Hypothesis 1: The relationship between MHL, help-seeking behaviour, and mental health outcomes

To address the first hypothesis of the study, a series of correlations were performed. A higher score in MHL was associated with a higher score in help-seeking behaviour and wellbeing, as well as a lower score in psychological distress. For help-seeking behaviour, a higher score was associated with a higher score in wellbeing, as well as a lower score in psychological distress. For psychological distress, a higher score was associated with a lower score in wellbeing. Finally, an increase in age was associated with a lower score in psychological distress and a higher wellbeing score (Table 3).

Table 3

Spearman correlations between age, MHL, help-seeking behaviour, psychological distress, and wellbeing in PGRs.

Parameters	**Age**	**MHLS**	**GHSQ**	**K-10**
Age	-	-	-	-
MHLSa	0.010	-	-	-
GHSQb	-0.053	**0.206****	-	-
K-10c	**-0.237****	**-0.289****	**-0.183***	-
WEMWBSd	**0.156***	**0.224****	**0.257****	**-0.719****

*$p < 0.05$, **$p < 0.010$
a $n = 234$
b $n = 240$, $n = 233$
c $n = 193$, $n = 188$, $n = 192$
d $n = 241$, $n = 234$, $n = 240$, $n = 193$

In order to explore the predictive utility of individual differences on MHL and to address the first hypothesis of this study, help seeking behaviour and mental health outcomes, a series of stepwise multiple regressions were performed.

3.4.1 Mental health literacy

Identifying as BAME predicted lower MHL compared to white, similarly with international students compared to Home/EU and in researchers who did not know of a friend or family member with a mental health problem. A higher score for general help-seeking predicted a higher total score for MHL, as did identifying under the LGBT + spectrum (Full model: F (5, 164) = 19.58, $p < 0.001$) which included ethnicity (adjusted r^2 change = 0.223; β = - 0.477, t = - 6.93, $p < 0.001$), general help-seeking total score (r^2 change = 0.053; β = 0.231, t = 3.460, $p < 0.010$), fee status (r^2 change = 0.051; β = - 0.287, t = - 3.50, $p < 0.010$), sexual orientation

(r^2 change = 0.027; β = 0.167, t = 2.617, $p < 0.050$), and self-reported mental health conditions in others (r^2 change = 0.022; β = - 0.161, t = - 2.37, $p < 0.050$), predicted 36.2% (adjusted r^2) of variance in MHL).

3.4.2 Help-seeking behaviour

A higher total score for wellbeing, as well as MHL, predicted a higher total score for help-seeking behaviour. Fee status predicted help-seeking behaviours, with international researchers reporting a higher help-seeking total score compared to Home/EU researchers. Age also predicted help-seeking behaviours, with older age predicting a lower score on the measure of help-seeking behaviour (Full model: F (4, 166) = 11.32, $p < 0.001$) which included wellbeing total score (adjusted r^2= 0.094; β = 0.316, t = 4.27, $p < 0.001$), MHL total score (r^2 change = 0.035; β = 0.191, t = 2.580, $p < 0.050$), fee status (r^2 change = 0.058; β = 0.265, t = 3.438, $p < 0.010$), and age (r^2 change = 0.025; β = - 0.159, t = - 2.283, $p < 0.050$), predicted 19.9% (adjusted r^2) of variance in help-seeking behaviour).

3.4.3 Psychological distress

A higher score for wellbeing predicted a lower total score for psychological distress, older age predicted a lower total score for psychological distress and knowing a friend/ family member with a mental health problem predicted a higher total score for psychological distress (Full model: F (3, 165) = 76.12, $p < 0.001$), wellbeing total score (adjusted r^2 = 0.523; β = - 0.725, t = - 13.47, $p < 0.001$), age (r^2 change = 0.035; β = - 0.187, t = - 3.57, $p < 0.001$), and self-reported mental health problem in others (r^2 change = 0.025; β = 0.159, t = 3.126, $p < 0.010$) of 57.7% (adjusted r^2) variance in psychological distress).

3.4.4 Wellbeing

A higher total score for psychological distress predicted a lower total score for wellbeing. For help-seeking behaviour, a higher total score predicted a higher total score for wellbeing, as did knowing a friend/family member with a mental health condition (Full model: F (3, 166) = 70.220, $p < 0.001$), which included psychological distress total score (adjusted $r^2 = 0.518$; $\beta = -0.722$, $t = -13.39$, $p < 0.001$), general help-seeking total score (r^2 change = 0.026; $\beta = 0.164$, $t = 3.051$, $p < 0.010$), and self-reported mental health conditions in others (r^2 change = 0.017; $\beta = 0.132$, $t = 2.537$, $p < 0.05$), predicted 55.6% (adjusted r^2) variance in wellbeing).

3.5 Hypothesis 2: Comparison between undergraduate students and PGRs

3.5.1 Sample characteristics

Of the undergraduates in the sample (total $n = 330$), 62.4% were male, 88.5% did not have a previous diagnosis of a mental health problem by a medical professional, 62.7% were in their first year of study. The undergraduate students in the sample were aged between 18-64 years ($M = 20.23$, $SD = 4.332$), and in their first year of study (62.7%). The sample characteristics of PGRs are reported in section 3.1 (Tables 1 and 2).

3.5.2 Group differences

To address the second hypothesis of this study, a series of univariate ANCOVA were performed. Bonferroni adjusted post-hoc comparisons indicated that PGRs reported higher levels of psychological distress, compared to undergraduate students (PGRs: $M = 24.98$; $SE = 0.67$; Undergraduate students: $M = 20.81$; $SE = 0.53$), after accounting for significant covariates of age, sex, and previous mental health diagnosis (all $p < 0.05$). In addition, PGRs reported higher levels of MHL, compared to undergraduate students
(PGRs: $M = 127.67$; $SE = 0.78$; Undergraduate students: $M = 123.43$; $SE = 0.65$), after accounting for significant covariates of sex, and previous mental health diagnosis (all $p < 0.001$). No significant group differences were observed for help-seeking or wellbeing (all $p > 0.05$) (Table 4).

Table 4

Univariate ANCOVA for MHL, psychological distress, help-seeking, and wellbeing in PGRs and undergraduate students.

Variable	***F(df)***	***partial eta sq***
Mental health literacy (MHLS)	16.29 (1, 560)	**0.02*** **
Psychological distress (K-10)	17.75 (1, 457)	**0.03*** **
Help-seeking (GHSQ)	3.16 (1, 568)	0.00
Wellbeing (WEMWBS)	1.53 (1, 504)	0.00

Note *** $p < 0.001$

4. Discussion

This study explored the relationship between MHL, help-seeking behaviour, psychological distress and wellbeing in PGRs at two universities in England. To provide context for the experiences of PGRs, data from the current study was compared to data from undergraduate students, obtained from AUTHOR (2017), due to the similar methodology and potential to highlight the need for targeted PGR support. Key results and interpretations will now be discussed.

4.1 The relationship between MHL, help-seeking behaviour and mental health outcomes (hypothesis 1)

We hypothesised that MHL would correlate with, and predict, help-seeking behaviour (positively correlated), wellbeing (positively correlated) and psychological distress (negatively correlated). In this study, our findings align with our first hypothesis. Higher scores in MHL were associated with higher scores in help-seeking behaviour and wellbeing, as well as a lower scores in psychological distress.

Previous research has not reported an association between MHL with psychological distress or wellbeing, but has with help-seeking behaviour (O'Connor & Casey, 2015; AUTHOR, 2017). Providing evidence for the relationship between MHL and outcomes such as psychological distress and wellbeing is important. If MHL can reduce mental health risk factors and encourage help-seeking, this could then be emphasised as part of early intervention and prevention programmes (Kutcher et al., 2016; Wei et al., 2015).

Multiple linear regressions were also analysed to supplement correlations and explore the predictive relationship between MHL, help-seeking behaviour, psychological distress and wellbeing, after adjusting for confounding variables such as age. The results indicated that wellbeing was the best predictor of psychological distress (and vice-versa). Mental health literacy was not a predictor variable in either model, but help-seeking was for wellbeing. The inclusion of regressions extends previous research in this area (e.g., O'Connor & Casey, 2015; AUTHOR, 2017). Whilst the relationship between MHL and help-seeking is well-reported (e.g., Altweck et al., 2015; Gagnon et al., 2015; O'Connor & Casey, 2015; Gagnon et al., 2015; AUTHOR. 2017; Hunt et al., 2019). As others have highlighted, this study suggests that further work is needed to identify the strength of the association between MHL and psychological distress (e.g., Dumesnil and Verger (2009); Reavley et al., 2014).

If wellbeing predicts distress in PGRs, but not MHL, how could universities further support PGRs? As highlighted by Metcalfe et al. (2018) and others (Waight & Giordano, 2018), the mental health and wellbeing of PGRs is linked with the institutional environment. An avenue for exploration may be a programme of transformation, as advocated by the Step Change Framework, developed by Universities UK (UUK, 2018), to support PGR mental health. The Framework recommends that universities consider mental health across all University activities and levels of staff seniority. In doing so, a cultural transformation would promote healthy and supportive working environments. Universities could also incorporate recommendations made by Metcalfe et al. (2018) which encompasses the development of institutional strategies and resourcing student support services, amongst others.

4.2 Comparison between undergraduate students and PGRs (hypothesis 2)

In this study, PGRs reported higher levels of psychological distress, compared to undergraduate students (recruited from AUTHOR, 2017), after adjusting for age, sex, and previous mental health diagnosis (self-reported). In addition, PGRs had higher levels of MHL, compared to undergraduate students, after adjusting for sex and previous mental health diagnosis. Our findings align with the second hypothesis of this study for psychological distress, but not wellbeing. Few studies have explored comparisons between PGRs and other students (e.g., undergraduate), as well as the general population (e.g., adults not studying in higher education). One study, conducted by Levecque et al. (2017), reported that doctoral researchers were at greater risk of having or developing a common mental health condition (such as depression or anxiety) compared to the highly educated general population (2.43 times higher), highly educated employees (2.84 times higher), and other higher education students (1.85). In Australia, Barry et al. (2018) noted that doctoral researchers were more stressed, anxious and depressed compared to age-matched norms from the general population.

Taken together, why might PGRs report higher levels of distress compared to undergraduate students, as highlighted in this study? The majority of the sample were first year PhD researchers, with the survey distributed in the first term of study. Differences between the environmental pressures and demands of undergraduate and postgraduate education have been noted (Tobbell, O'Donnell, & Zammit, 2010), with postgraduate education purported to be characterised by anxiety and self-doubt (McPherson, Punch, & Elizabeth, 2017). Moreover, PGR study-related factors environment may be a cause for stress, such as work-life balance, and supervision, amongst others (Pyhältö, Toom, Stubb, & Lonka, 2012). Such factors, representing greater challenge in postgraduate compared to undergraduate education, may have facilitated the elevated psychological distress noted in PGRs in this current study.

Alternatively, the higher rates reported in PGRs may be the result of the self-report instrument utilised in this study. The K-10 was developed as a measure of non-specific psychological distress (Kessler et al., 2005), not as a screening tool, and intended to be used as a prompt for further exploration of depression and anxiety-related symptoms.

The elevated levels of distress observed in PGRs in the current study, may be the result of overestimation of distress- a limitation which has been reported elsewhere (Jarman et al., 2014).

4.3 Limitations

There are a number of limitations of this study. Firstly, the sample is biased, with a number of demographic groups underrepresented. The underrepresented demographic groups include those that identify across the LGBT + spectrum, BAME students, international students, male students, individuals completing professional doctorates, and PGR students in their third year + of study. Ensuring a balanced sample profile will ensure that adequate analyses of individual differences can be examined. Researchers need to dedicate effort in exploring avenues for addressing the imbalance in study recruitment, and engaging underrepresented groups in research (Rugkåsa & Canvin, 2010). Co-produced research may be one method of engagement (Slay & Stephens, 2013).

Secondly, a low response rate was obtained in this study, limiting generalisability. However, the response rate is consistent with previously published survey research on similar topics associated with mental health, in doctoral researchers and is satisfactory for the short recruitment period. For example, Levecque et al. (2017) distributed an online questionnaire in 2013 (the authors did not state the recruitment period) and received a 33% response rate from a total population of 12,191 doctoral researchers. In addition, Waight & Giordano (2018) reported a 23% response rate for their mixed methods survey (quantitative and qualitative) in PGRs. The low response rate, coupled with the content (mental health) reported thus far within the PGR literature across the sector warrants further investigation, as well as a discussion regarding the appropriateness of utilising these methods in this population when generalisability should be paramount.

Thirdly, the cross-sectional nature of the study limits causal interpretations of the data (Sedgwick, 2014). It is unclear how such outcomes may fluctuate over the course of the PhD lifespan. The majority of the sample were first year PhD researchers, with the

survey distributed in the first term of study. It could be speculated that the study results may highlight the potential challenges of transitioning to doctoral level education, from other areas in and outside of HE. For instance, Tobbell et al. (2010) note that postgraduate students (masters or doctoral candidates) reported experiencing difficult transitions from undergraduate study, such as the focus on independent study, which could exacerbate feelings of isolation and incompetence, amongst others. Longitudinally, recent evidence suggests that perceived stress may be highest during periods of unstructured work (Sverdlik & Hall, 2019), but further work needs to be conducted to examine mental health outcomes from this perspective. As such, the current results may be skewed and provide an unrealistic expectation of the level of distress of PGRs.

Furthermore, levels of psychological distress may be overestimated in this study. It is possible that participants were more motivated to complete the survey because they were experiencing elevated levels of distress - a limitation also acknowledged by Evans, Bira, & Vanderford, 2019) in their recent international survey on PGR mental health. It is also unclear what is contributing to elevated levels of distress in PGRs, as quantitative methods were employed. Previous research suggests that study-related factors such as general work-related processes (e.g., motivation), supervision, and scholary community amongst others may contribute to the wellbeing of PGRs (Pyhältö et al., 2012). Further studies should use a range of methods, including mixed methods, to fully explore the nature of PGR mental health and wellbeing, specific to the study-related context. In sum, the limitations of the study should be taken into account and results, particularly regarding levels of psychological distress, should be interpreted with caution.

4.4 Summary and recommendations

The results of this study indicated that the majority of PGRs in two universities in England who completed the mental health and wellbeing survey reported experiencing mild-severe levels of psychological distress. In addition, levels of self-reported distress were higher in PGRs, compared to undergraduate students. Whilst MHL is associated with help-seeking behaviour, psychological distress and wellbeing, it did not predict

psychological distress or wellbeing in this sample of PGRs. However, limitations of the study should be considered, which encompasses response bias, as well as the cross-sectional nature of the research. This study recommends that future work explores the factors (e.g., educational transitions) that contribute to the psychological distress of PGRs in their first term of study, so that further supporting mechanisms can be implemented. Moreover, implementing a programme of MHL may improve help-seeking behaviour in PGRs and aid in prevention and early identification, but further work is needed to demonstrate its promise in improving outcomes such as psychological distress and wellbeing. Additionally, any MHL programme designed in the future needs to demonstrate a full understanding of the cultural context (in addition to personal, environment factors) in which it is situated in. As such, organisations need to be aware of, embrace, and support diversity, and monitor continuously the evolving influences of culture on mental health (AUTHOR., 2020).

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Declaration of interest statement

The authors do not have any conflicts of interest to declare.

Data Availability Statement

Data that supports the results of the study can be requested from the corresponding author (AUTHOR).

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[The reference for AUTHOR (2017) and AUTHOR 2020 will be included in the full reference list after anonymous peer review]

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