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Determinants of wellbeing in university students: The role of residential status, stress, loneliness, resilience, and sense of coherence

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Abstract
Maintaining wellbeing in university students is a government priority, but robust evidence has been lacking. Higher wellbeing is associated with better mental and physical health, higher self-esteem, self-efficacy, and effective coping strategies. This study aimed to identify, through an online survey in 2018, key determinants of wellbeing amongst a sample of 574 (65.5% female) students across all levels of study at a university in the UK. Most respondents (526 (91.8%)) reported feeling unusually stressed or overwhelmed at university. Residential students reported higher loneliness and number of stressors than commuter students, and postgraduate students reported higher wellbeing, resilience, and sense of coherence, and lower perceived stress and loneliness. Hierarchical regression analyses showed that 71.8% of the variance in wellbeing was predicted by a model containing demographics (age/gender, level of study, number of stressors), psychosocial variables, and perceived stress, with perceived stress, sense of coherence, loneliness, and resilience the strongest predictors. The findings suggest that interventions designed to improve resilience and sense of coherence, and reduce loneliness and perceived stress are likely to be effective in enhancing wellbeing in a student population.

Keywords Wellbeing · Students · Stress · Resilience · Sense of coherence · Loneliness

Introduction

Mental health and wellbeing in university students is of increasing concern throughout the world (Royal College of Psychiatrists, 2011; Brown, 2018; Hughes & Spanner, 2019). Increasing numbers of students are reporting and seeking support for mental health difficulties (Auerbach et al., 2018), possibly due to a number of factors including increasing financial pressures, uncertain future career prospects, widening participation, and an increased awareness of the signs and symptoms of mental health difficulties (Pollard et al., 2019; Royal College of Psychiatrists, 2011). Although this trend is reflected in the general population – mental health difficulties have increased in young people aged 16–24 across a similar timescale (Johnson & Crenna-Jennings, 2018) – students have in recent years scored lower than their non-student counterparts on a number of measures of wellbeing (Neves & Hillman, 2019). Students attending university for the first time at this age are vulnerable to mental health difficulties, with evidence suggesting that the majority of mental illnesses develop by the time an individual reaches their mid-20 s (Kessler et al., 2007).

The transition to university is often a time of great upheaval requiring rapid adjustment and considerable personal resources (Lipson & Eisenberg, 2018). During this period, students may not only need to move home, often to a new place away from friends and family, but also need to make new social connections, manage finances, manage a household and manage their own time, which can be frightening new experiences for them. Many students also have to juggle academic study with paid work and other commitments, alongside an increasingly busy social life. Combined with the transition towards academic autonomy, the requirement for considerable independent study, and constant assessment deadlines with reduced support from tutors compared to their previous school experience, the university

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experience itself can be a source of stress and has been associated with increased mental health difficulties (Cleary et al., 2011). However, little published research exists on how the university experience affects student wellbeing (Barkham et al., 2019), and how individual psychological characteristics, such as personality, outlook, and coping resources, might influence students' ability to maintain their wellbeing in the face of personal and academic stressors. Thus, understanding the determinants of student wellbeing across all levels of study and personal circumstances is vital to enable universities to help support students and prevent the development of mental health difficulties that may continue throughout their lives.

University-Related Factors

The university experience is changing. Financial pressures and widening participation initiatives have resulted in greater numbers of students remaining in the family home while undertaking their university studies (Pollard et al., 2019). This is particularly the case in city-based universities, where strong transport links facilitate commuting to the university campus, enabling more students to study from home in their local area. These 'commuter' or 'stay-at-home' students, who constitute as much as 90% of the student population at some universities (Jones, 2020), experience university in a qualitatively different way to 'residential' students who live in halls or shared accommodation, and are more likely to come from underrepresented groups and experience lower progression rates than their peers (Office for Students, 2020a). Lower achievement can lead to negative impacts on mental health and wellbeing, which for commuter students is compounded by the challenge of developing social connections with fellow students, particularly when social events are held on campus during the evenings or weekends. In addition, commuter students are often overlooked by student societies or support services. Evidence suggests that commuter students fare less well than their residential counterparts in terms of academic achievement (Office for Students, 2020a) and satisfaction with life (Blackman, 2020; Office for Students, 2020b).

Although there is a paucity of longitudinal research on student wellbeing, one such study demonstrated that psychological wellbeing and anxiety levels fluctuated across the three-year undergraduate degree, and across the academic year (Bewick et al., 2010). Macaskill (2013) reported increased psychiatric symptoms amongst second year undergraduates, although the reasons for this warrant further investigation. High levels of mental distress and low wellbeing have also been reported amongst postgraduate research students (Byrom et al., 2020). Understanding the predictors of wellbeing at different stages of the university experience is vital for ensuring student support services are tailored appropriately.

University students experience many stressors including assessments, financial difficulties, relationship and family difficulties, and job insecurity. Lazarus and Folkman's (1984) transactional model of stress conceptualises perceived stress as an individual's appraisal of their circumstances as stressful in relation to their ability to cope. High perceived stress has been associated with higher levels of mental health difficulties, including anxiety and depression (Stowell et al., 2021). Perceived stress, particularly relating to assessment, has been shown to be a strong predictor of student mental health and wellbeing (Denovan & Macaskill, 2017; McIntyre et al., 2018; Neves & Hillman, 2019).

Psychosocial Resources

Research into the determinants of wellbeing has emphasised the importance of psychosocial factors and resources in underpinning an individual's approach and response to life circumstances, which in turn influences their outlook and mental wellbeing (Diener et al., 1999). Three such factors are loneliness, resilience and sense of coherence.

Loneliness has also been shown to be an important determinant of student wellbeing and mental distress (McIntyre et al., 2018). Although – and possibly because – university is often championed as a time of increased social connectedness, where students will meet life-long friends or romantic partners, increasing numbers of students report feeling lonely (Diehl et al., 2018). This issue is especially acute for commuter students who remain more connected to their family and childhood friendships than their academic peers (Office for Students, 2020a). This can also create a disconnect for these students both socially and intellectually when 'transitioning' back into their home lives and mixing with family and peers who may not have attended university themselves (Office for Students, 2020b).

Resilience is here conceptualised as a process by which an individual 'bounces back' from adversity (Fletcher and Sarkar, 2013; Windle, 2011), enabling them to respond to stressful situations in a positive way and both maintain their wellbeing and/or use the experience to flourish by developing their personal skills and resources. Resilience has been strongly associated with subjective and psychological wellbeing, including mental health difficulties, in a variety of populations (Smith et al., 2008; Windle, 2011), including young adults (Campbell-Sills et al., 2006). Understanding and supporting the development of resilience has been highlighted as a key priority within higher education policy and practice (McIntosh & Shaw, 2017).

Sense of coherence (SOC) stems from Antonovsky's (1987) salutogenic approach to stress and health – focussing on the factors and resources that help people maintain their

health and wellbeing in the face of life's challenges. SOC is thought to develop in early adulthood and remain stable across the life course (Antonovsky, 1987; Hakanen et al., 2007). It incorporates three dimensions: meaningfulness (whether one's life conveys purpose and meaning), comprehensibility (whether the circumstances of one's life make sense and are understandable), and manageability (whether a person feels they can cope with the circumstances of their life). There are similarities between these dimensions and other psychological constructs, most notably purpose and meaning (Ryff & Keyes, 1995), self-determination theory (Ryan & Deci, 2000), and self-efficacy (Bandura, 1977). SOC is theorised to play a mediating role, enabling individuals to mobilise psychosocial resources such as personality and social support to ensure successful coping and adaptation in response to adversity. This theory has been confirmed empirically in adults (Gana, 2001), and older adults (Wiesmann & Hannich, 2013). Sense of coherence has been strongly associated with both physical and mental health (Eriksson, 2022). However, very little research has hitherto investigated its role in facilitating student wellbeing.

Drawing together the theory and evidence presented, we propose the model of wellbeing in students outlined in Fig. 1. In essence, how a student feels (particularly how stressed they feel) will influence how they rate their wellbeing. A student's perceived stress will be influenced by what is happening to them (including background demographics and current circumstances) and their ability to cope with challenges (represented by psychosocial resources such as resilience, sense of coherence, and social support). Overall, a student's wellbeing will be influenced by a combination of these three—circumstances, psychosocial resources, and perceived stress.

The current study aimed to test this model of wellbeing in a student population at a large, city-based university in the UK. We adopted a salutogenic approach, focussing on the factors that enhance positive mental wellbeing in students, in contrast to the pathogenic approach adopted by most previous research on the wellbeing of students, which focusses on mental health and illness (Hernández-Torrance et al., 2020). The study was innovative in both the salutogenic approach and in comparing wellbeing and its determinants across all levels and subjects of university study, whereas much previous research has focussed on individual year groups or subjects.

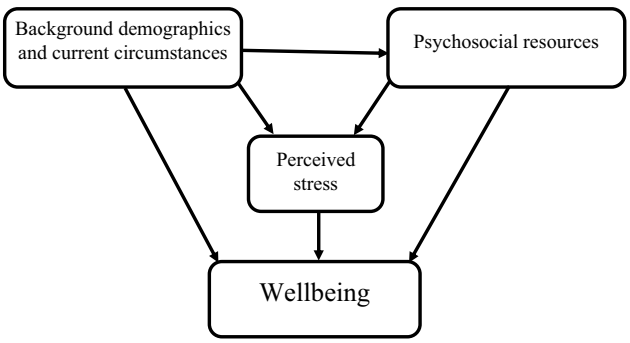

Fig. 1 Proposed model of wellbeing in students

Based on previous literature, and the proposed model of wellbeing, the study aimed to address the following hypotheses:

1. Commuter and residential students will differ on measures of wellbeing, perceived stress, and psychosocial resources.
2. Scores on measures of wellbeing, perceived stress, and psychosocial resources will differ across different levels of study.
3. A significant amount of variance in wellbeing will be explained by a model containing background demographics / circumstances, psychosocial resources (resilience, sense of coherence, and loneliness) and perceived stress.
4. Each component or step of the model will explain a significant amount of variance in wellbeing.

Methods

Design

A cross-sectional correlational design was conducted with mental wellbeing as the dependent variable and demographics (age, gender, residential status, level of study, number of stressors), psychosocial resources (resilience, sense of coherence, loneliness) and perceived stress as predictor variables.

Participants

All students currently registered at a large post-92 university in the north west of England, UK (N = ~20,000), were invited via email to participate in the study, which was conducted online in February-April 2018. Due to the success of widening participation initiatives, the student population at this university is diverse and includes a good balance of commuter and residential students. It is, therefore, well placed to provide a representative sample of university students in the UK. 574 students (mean age = 24.51, s.d. = 8.39, range 17–67) completed at least part of the online questionnaire. 376 (65.5%) were female, 112 (19.5%) male, 4 (0.7%) other, 2 (0.3%) prefer not to say, and 80 (13.9%) did not answer the gender question.

Measures

Demographics

Participants were asked to give their gender and age in years, the main subject area of their degree (based on the university's administrative structure), and their level of study from 3 (foundation year) through 4–6 (undergraduate 1st to 3rd year) up to 7 (postgraduate masters level) and 8 (doctorate). Due to small numbers of students from level 3, levels 3 and 4 were collapsed into one category for statistical analysis.

Residential status

Participants were asked to indicate whether their living status was "at home, commuting into university" or "living with other students in halls or shared accommodation". If neither of these, they were asked to provide more details. The responses were grouped into four categories: commuter, residential, postgrad/mature (incorporating students who owned their own home or lived alone AND were at level 7 or 8), and other. Only one student fell into the 'Other' category – they reported living in halls during the week and returning home at weekends for paid work purposes.

Experiences and Causes of Stress

Participants were asked to indicate whether, during their time at university, they had ever felt unusually stressed or overwhelmed. They were then asked to indicate their primary sources of stress using the following question: "If you have felt or think you ever would feel increased stress or pressure, what would be the main trigger?". Response options were pre-determined based on previous literature and student consultation and included managing university workload, personal problems outside of university work, social worries, money worries, concerns about finding a job after university, difficulty settling into Liverpool, loneliness, and other. Further information given in the 'other' category was used to further categorise common stressors. The total number of stressors (or potential stressors) reported was calculated for each participant.

Mental Wellbeing

The Warwick Edinburgh Mental Wellbeing Scale (Tennant et al., 2007) was used to measure mental wellbeing. Participants were asked to indicate, on a Likert-type scale of 1–5, the extent to which they had experienced 14 positively-worded statements during the last 2 weeks. Possible scores range from 14–70, with high scores indicating greater mental wellbeing.

Sense of Coherence

The 13-item Orientation to Life Scale (Antonovsky, 1987) was used to measure SOC. Participants were asked to respond to a series of statements covering the three dimensions of meaningfulness (SOC Me), comprehensibility (SOC Co), and manageability (SOC Ma), on a Likert-type scale of 1–7. After reversal of appropriate items, scores are calculated for each of the dimensions and the total (range 13–91), with higher scores indicating a higher sense of coherence.

Resilience

The Brief Resilience Scale (BRS; Smith et al., 2008) was used to measure resilience. This consists of 6 items, on a scale of 1–5. After reversal of three items, the mean score of all 6 items was calculated, with higher scores indicating higher resilience.

Perceived Stress

The Perceived Stress Scale (PSS; Cohen et al., 1983) was used. Participants were asked to read a series of 10 statements and indicate, on a four-point scale from 0–4 from Never to Very often, the extent to which this was true of them over the last month. After appropriate reversals, scores are summed to give a total perceived stress with a range of 0–40, higher scores indicating greater stress.

Loneliness

This was measured using a single item: "Loneliness can be a serious problem for some people and not for others. At the present moment do you feel lonely?" This item has been used in a number of longitudinal cohort studies and has been shown to be strongly associated with measures of subjective wellbeing (Gow et al., 2007). Participants provided their response on a five point scale from Most of the time (1) to None of the time (5), with higher scores indicating lower loneliness.

Procedure

Participants were presented with the participant information sheet online. Consent was implied by completion of the study questionnaire. Participants were then invited to complete the questionnaires, which took an average of 23 minutes. All participants were fully debriefed on completion of the study.

Ethical Considerations

Ethical approval for the study was granted by the appropriate university Research Ethics Committee (REF: 18/NSP/0008). Participants were informed of the purpose and nature of the study in the participant information sheet. Consent was implied by completion of the study questionnaire. All data was fully anonymous at the point of collection and participants were debriefed at the end of the study.

Statistical Analysis

Independent sample t-tests were used to compare commuter and residential students and one-way ANOVA to investigate the effect of level of study on resilience, SOC, loneliness, perceived stress, number of stressors, and wellbeing.

Pearson bivariate correlations were calculated to investigate associations between all the predictor variables and mental wellbeing.

Hierarchical linear regression analysis was then conducted to test the effect of the predictor variables on mental wellbeing. Level of study was recoded as dummy variables, with level 3–4 as the reference, in order to ascertain differences in wellbeing across levels. Variables were entered into the model based on the proposed model of wellbeing. Age, gender, level of study dummy variables and number of stressors were entered at the first step, resilience, SOC and loneliness at the second, and perceived stress at the third step.

Results

Summary demographics, including experiences of stress and number of stressors, for all participants are presented in Table 1.

Due to small numbers in level 3 (foundation year), levels 3 and 4 were collapsed into one category for all inferential analyses. Overall, 526 (91.6%) participants reported having felt unusually stressed or overwhelmed since starting university, citing a mean number of 3.17 (S.D. = 1.51) stressors. Chi squared tests indicated significant differences between levels of study (X^2 (4, N = 494) = 15.274, $p < 0.01$), with students at levels 5, 6, and 8 more likely to report having experienced stress while at university – this was echoed in the number of stressors reported ($F(4,489) = 11.341$, $p < 0.001$).

Descriptive statistics for all psychological variables for all participants, and divided by gender, residential status, and

Table 1 Demographics for all participants, including number of stressors reported

Measure		N (%)	Experienced stress (Yes) N (%)	Number of stressors Mean (SD)
Gender	Male	112 (22.7)	100 (89.3)	3.02 (1.49)
	Female	376 (76.1)	348 (92.6)	3.24 (1.49)
	Other / Prefer not to say	6 (1.2)	5 (83.3)	4.00 (0.89)
Level of study	Level 3 (foundation)	14 (2.8)	12 (85.7)	2.43 (1.16)
	Level 4	123 (24.9)	108 (87.8)	2.97 (1.50)
	Level 5	115 (23.3)	112 (97.4)	3.46 (1.42)
	Level 6	141 (28.5)	133 (94.3)	3.67 (1.44)
	Level 7 (postgraduate masters)	67 (13.6)	56 (83.6)	2.40 (1.19)
	Level 8 (postgraduate doctorate)	34 (6.9)	32 (94.1)	3.15 (1.65)
Residential status	Commuter	202 (41.1)	183 (90.6)	2.79 (1.28)
	Residential	252 (51.2)	235 (93.3)	3.56 (1.53)
	Postgrad / mature student	38 (7.7)	33 (86.8)	3.00 (1.64)
Field of study	Psychology	48 (9.7)	42 (87.5)	3.10 (1.52)
	Education	40 (8.1)	37 (92.5)	3.12 (1.59)
	Other science	113 (22.9)	102 (90.3)	3.20 (1.39)
	Other humanities	31 (6.3)	30 (96.8)	3.35 (1.58)
	Engineering	45 (9.1)	43 (95.6)	2.93 (1.16)
	Arts	49 (9.9)	48 (98.0)	3.76 (1.51)
	Law or business	43 (8.7)	39 (90.7)	3.44 (1.79)
	Social science	37 (7.5)	34 (91.9)	2.83 (1.22)
	Vocational degree healthcare	70 (14.2)	65 (92.9)	3.40 (1.92)
	Vocational degree other	15 (3.0)	12 (80.0)	2.50 (2.12)
	Other	2 (0.4)	1 (50.0)	3.20 (1.49)

level of study, are shown in Table 2. Independent samples t-tests indicated that females reported significantly higher perceived stress (t(476) = -3.145, p < 0.01), lower resilience (t(486) = 2.912, p < 0.01), and lower SOC manageability (t(481) = 2.746, p < 0.01) than males.

Residential Status

Independent samples t-tests indicated that residential students reported significantly higher loneliness (t(452) = 3.580, p < 0.001) and a greater number of stressors (t(451.353) = -5.820, p < 0.001) than commuter students. No other differences were significant at the p < 0.01 level.

Level of Study

One-way ANOVAs indicated significant differences in scores between students at different levels of study, with post-hoc tests suggesting greater wellbeing (F(4,475) = 8.109, p < 0.001), resilience (F(4,489) = 5.521, p < 0.001), lower perceived stress (F(4,479) = 6.511, p < 0.001), and lower loneliness (F(4,489) = 6.103, p < 0.001) amongst the two postgraduate groups (levels 7 and 8, masters and PhD) compared to the three undergraduate groups.

Postgraduate students at level 7 and 8 also reported greater scores on the measure of sense of coherence (F(4,466) = 8.781, p < 0.001) and its subscales: meaningfulness (F(4,484) = 9.240, p < 0.001), comprehensibility (F(4,475) = 6.981, p < 0.001), and manageability (F(4,484) = 6.508, p < 0.001).

Determinants of Wellbeing

Bivariate correlations (Table 3) showed significant associations between mental wellbeing and all the predictor

Table 2 Scores on all psychological variables for all participants, and by gender, residential status, and level of study

Group		WEMWBS	PSS	BRS	Loneliness	SOC Me	SOC Co	SOC Ma	SOC total
All		40.98 (10.29)	22.98 (7.36)	2.95 (0.87)	2.84 (1.19)	16.88 (5.02)	17.26 (5.91)	14.81 (4.73)	48.67 (13.48)
Gender	Male	48.44 (10.29)	20.93 (7.76)	3.16 (0.88)	2.99 (1.26)	16.61 (5.19)	17.46 (6.12)	15.89 (4.76)	49.74 (13.93)
	Female	40.79 (10.28)	23.55 (7.13)	2.89 (0.85)	2.82 (1.16)	17.01 (4.98)	17.19 (5.83)	14.50 (4.66)	48.39 (13.35)
Residential status	Commuter	41.35 (10.81)	23.05 (7.52)	2.99 (0.85)	3.03 (1.20)	17.18 (5.31)	17.76 (6.23)	14.72 (4.77)	49.62 (14.50)
	Residential	40.33 (9.47)	23.45 (6.80)	2.89 (0.85)	2.64 (1.12)	16.24 (4.70)	16.50 (5.29)	14.61 (4.53)	47.09 (12.03)
	Postgrad/ mature	45.39 (11.60)	19.47 (9.39)	3.05 (1.04	3.13 (1.32)	19.82 (7.42)	19.82 (7.43)	16.19 (5.61)	53.79 (15.98)
Level of study	3–4	40.49 (10.04)	22.90 (7.18)	2.88 (0.83)	2.62 (1.16)	16.40 (5.07)	16.03 (5.54)	14.64 (4.59)	46.77 (12.87)
	5	39.20 (10.17)	23.81 (7.42)	2.77 (0.86)	2.69 (1.09)	16.04 (4.79)	16.74 (5.69)	13.97 (4.68)	46.82 (12.72)
	6	39.74 (9.67)	24.57 (6.51)	2.90 (0.88)	2.87 (1.23)	16.11 (5.08)	16.96 (5.79)	14.14 (4.45)	46.93 (13.36)
	7	46.66 (10.22)	19.68 (8.13)	3.30 (0.82)	3.42 (1.13)	19.22 (4.30)	19.92 (6.14)	16.71 (4.89)	55.07 (13.28)
	8	45.06 (9.64)	20.45 (7.42)	3.25 (0.89)	3.03 (1.19)	19.91 (4.33)	19.94 (6.09)	17.09 (4.76)	56.88 (13.16)

Note. SOC = Sense of coherence. SOC Me = Meaningfulness, Co = Comprehensibility, Ma = Manageability. WEMWBS = Warwick Edinburgh Mental Well-Being Scale. PSS = Perceived Stress Scale; BRS = Brief Resilience Scale

Table 3 Bivariate correlations between all continuous predictor variables and WEMWBS scores

Variable	WEMWBS	Age	Stressors	PSS	BRS	Lonely	SOC
SOC	.756**	.271**	-.398**	-.750**	.614**	.594**	—
Lonely	.569**	.181**	-.381**	-.508**	.449**	—	
BRS	.593**	.139*	-.328**	-.622**	—		
PSS	-.801**	-.225**	.459**	—			
Stressors	-.391**	-.209**	—				
Age	.213**	—					

*Note: * = p < .01; ** = p < .001*

variables. All were in the expected direction: higher resilience, higher SOC, lower perceived stress, and lower loneliness were all associated with higher wellbeing. Older age and higher year of study were also associated with higher wellbeing. The strongest associations were between wellbeing and perceived stress and SOC.

The hierarchical linear regression analysis results are shown in Table 4. All three models significantly predicted wellbeing. Demographics explained 17.5% of the variance (model $F(7, 425) = 14.13$, $p < 0.001$), psychosocial resources explained an additional 44.1% (model $F(10, 422) = 71.94$, $p < 0.001$) and perceived stress explained an additional 9.4% (model $F(11, 421) = 100.78$, $p < 0.001$). The final model explained 71.8% of the variance in wellbeing. The strongest predictors were perceived stress, SOC, loneliness, and resilience. Age, gender, level of study, and number of stressors all did not reach significance in the final model. All assumptions of linear regression were met.

Discussion

The findings show that commuter and residential students did not differ significantly on measures of wellbeing or psychosocial resources, although residential students did report greater loneliness and a higher number of stressors. Postgraduate students reported greater wellbeing, resilience, and SOC, and lower perceived stress and loneliness than undergraduate students. In terms of determinants of wellbeing, over 70% of the variance in wellbeing was explained by the final model, with SOC, perceived stress, loneliness, and resilience all making significant independent contributions and each model component predicting significant variance in wellbeing.

The observed differences between commuter and residential students were, perhaps, encouraging. While the findings contrast with previous research (Neves & Hillman, 2019) and our first hypothesis, they are not altogether surprising. Commuter students are often living within the family home, providing them with greater access to companionship and support and removing the personal stressors associated with transition to university such as the need to make new social connections and manage one's own household and finances. Postgraduate and mature students – who are often more settled in their residential status – reported better outcomes on all measures, although this again is unsurprising given the considerable differences in life circumstances between this group and other students.

Level of study appears to have had a significant impact on experiences of stress, mental wellbeing, and all psychosocial variables. Postgraduate students in general reported higher levels of wellbeing, resilience, and SOC, and lower loneliness and perceived stress, which contrasts with previous research (Byrom et al., 2020) – although doctoral students were more likely to report having experienced stress. Undergraduates in their 2nd and 3rd year reported a greater number of stressors, lower wellbeing, and higher perceived stress than the other groups, which is in keeping with previous research (Bewick et al., 2010; Macaskill, 2013).

The data support our proposed model of wellbeing, with each component of the model explaining significant variance in wellbeing. Psychosocial resources contributed the greatest amount of variance, which is in keeping with previous

Table 4 Hierarchical multiple linear regression with WEMWBS as the outcome

Variable	Step 1—Demographics				Step 2 – Psychosocial resources				Step 3 – Perceived stress			
	Beta	SE	β	p	Beta	SE	β	p	Beta	SE	β	p
(Constant)	35.07	2.01		< .001	13.54	1.96		< .001	43.52	3.02		< .001
Age	.11	.07	.08	.110	-.01	.05	-.01	.800	-.03	.04	-.02	.456
Gender	1.25	1.06	.05	.238	.14	.72	.01	.849	-1.00	.63	-.04	.116
Level 5*	-.25	1.26	-.01	.844	-1.26	.86	-.05	.143	-.98	.74	-.04	.187
Level 6	.99	1.23	-.04	.420	-.81	.84	-.04	.333	.11	.73	.01	.880
Level 7	3.41	1.66	.11	.040	.46	1.14	.02	.687	1.09	.98	.04	.266
Level 8	4.15	1.89	.11	.029	-.98	1.30	-.03	.453	-.17	1.13	-.00	.882
Stressors	**-2.39**	**.32**	**-.35**	**< .001**	-.33	.23	-.05	.163	.16	.21	.02	.449
BRS	–	–	–	–	**2.51**	**.45**	**.22**	**< .001**	**1.06**	**.41**	**.09**	**.009**
SOC	–	–	–	–	**.38**	**.03**	**.51**	**< .001**	**.18**	**.03**	**.24**	**< .001**
Lonely	–	–	–	–	**1.28**	**.33**	**.15**	**< .001**	**1.15**	**.29**	**.13**	**< .001**
PSS	–	–	–	–	–	–	–	–	**-.73**	**.06**	**-.52**	**< .001**
Adjusted r^2	.175				.622				.718			
r^2 change	.189				.441				.094			

*Note: *Level 3–4 is collapsed and used as the reference variable*

research (Brett et al., 2012; Diener et al., 1999; McIntyre et al., 2018).

Perceived stress was the strongest predictor of wellbeing in this study. The number of stressors reported, while significantly associated with wellbeing in univariate analyses and in step 1 of the hierarchical regression, did not reach significance in the final model, suggesting that how stressors are perceived by students is more important than the number of stressors experienced. This is in keeping with previous studies and the conceptualisation of perceived stress (Denovan & Macaskill, 2017; Lazarus & Folkman, 1984).

The finding that SOC and resilience were both significant predictors of wellbeing – even after controlling for the more proximal measures of perceived stress and loneliness – suggests these more stable psychological variables have a role to play in enabling students to maintain their wellbeing in the face of stress and adversity, and supports the adoption of a salutogenic approach to wellbeing in students, focussing on the factors that help students manage their stress and maintain their wellbeing, rather than mental health and illness (Antonovsky, 1987; Chu et al., 2016; Hernández-Torrano et al., 2020). Indeed, there is increasing awareness of the importance of resilience and interventions to enhance resilience amongst young people, including students, has become a key priority in higher education (McIntosh & Shaw, 2017) and public health (Association for Young People's Health, 2016). Multi-faceted, skills-based interventions have been shown to be effective in a variety of populations, with interventions combining Cognitive Behavioural Therapy techniques and mindfulness training proving effective in universities (Joyce et al., 2018). In contrast, despite its importance in promoting optimal functioning and wellbeing, there is a paucity of literature on the development of SOC (Joseph & Sagy, 2017). This is particularly the case in young people, with much research on SOC focussing on its role in promoting wellbeing in older adults.

Limitations

The current study has a number of limitations which affect the generalisability of its findings. The study took place within a single, city-based, higher education institution in a city in northwest England. Although the city is culturally and socioeconomically diverse, the findings may not be generalisable to other student populations. In particular, the experience of residential students on campus-based universities may be qualitatively different, with greater opportunities to meet other students and make friends. However, the study findings suggest – contrary to previous research – that residential status did not have an impact on wellbeing, although loneliness and perceived stress – two significant predictors of wellbeing – were higher amongst residential students.

A further limitation is the possibility of sample bias. The sample size of 574 represents only a small proportion (2.87%) of the 20,000 active students at the institution. Practical factors likely influenced this low response rate: the study invitation originated from an academic unknown to the majority of students, and via a generic student mailing list. However, it is also possible that participation was influenced by psychological factors that might have had a confounding effect on the study findings. First, although the male:female ratio at the institution is roughly 50:50, females were overrepresented in the study sample. Second, participating in a study on wellbeing might appeal more to students who are interested in this topic, either on a personal or academic level. Third, the survey invitation was sent out towards the end of semester two of the academic year, which can be a time of high stress due to the large number of assessment deadlines, resulting in low engagement with activities unrelated to assessment. Indeed, in Bewick et al.'s (2010) study, wellbeing was lowest and anxiety highest during semester two. However, as this was a cross-sectional study with all participants completing the survey during the same time period, the impact of this on the study findings will have been attenuated.

The final, key, limitation is that this study did not measure any potential mediating or moderating factors that might explain the relationship between the predictor variables and wellbeing. For example, personality traits are likely to contribute to students' susceptibility to experience stress, while understanding students' social connectedness – including social networks and social support – might further explain the observed differences in loneliness between residential and commuter students.

Implications and Conclusion

It is well documented that university can be a time of great stress for students (Neves & Hillman, 2019), which can lead to high levels of mental health difficulties among the student population (Royal College of Psychiatrists, 2011; Brown, 2018; Hughes & Spanner, 2019). This study found support for a new model of wellbeing which emphasises the importance of perceived stress and psychosocial resources including resilience, sense of coherence, and loneliness in determining wellbeing in students – over and above demographic variables, current circumstances, and the number of stressors experienced. It may be well-nigh impossible for universities to reduce the stressors experienced by students due to the difficulties of balancing assessment demands and student wellbeing (Jones et al., 2021), and the financial pressures resulting from government policy (Johnson & Crenna-Jennings, 2018). However, adopting a salutogenic approach by prioritising interventions to enhance students'

ability to cope with stressors might, therefore, help them maintain or improve their wellbeing and prevent the development of mental health difficulties. The results also suggest that reducing loneliness – for example by facilitating social connectedness amongst students – might also help improve wellbeing, particularly amongst residential students.

Further research is needed to fully understand the development of resilience and sense of coherence within the student population, and the mechanisms underlying their relationship with wellbeing. The model of wellbeing proposed here could be further developed to incorporate additional psychosocial factors such as personality, social support, optimism, and current mood. Finally, longitudinal research is needed to identify and understand the changes in wellbeing and its determinants that occur throughout the university journey.

Author contributions All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by MLM and CEB. First and subsequent drafts of the manuscript were written by CEB and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Declarations

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Competing interests The authors have no competing interests to declare that are relevant to the content of this article.

Ethical approval The questionnaire and methodology for this study was approved by the Research Ethics Committee of Liverpool John Moores University (REF: 18/NSP/0008).

Consent to participate Informed consent was obtained from all individual participants included in the study.

Data availability The datasets generated during and/or analysed during the current study are available in the LJMU Data Repository, https://opendata.ljmu.ac.uk/.

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