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Citation for final published version:

Harding, Sarah, Morris, Richard, Gunnell, David, Ford, Tamsin, Hollingworth, William, Tilling, Kate, Evans, Rhiannon , Bell, Sarah, Grey, Jillian, Brockman, Rowan, Campbell, Rona, Araya, Ricardo, Murphy, Simon and Kidger, Judi 2018. Is teachers' mental health and wellbeing associated with students' mental health and wellbeing? Journal of Affective Disorders 10.1016/j.jad.2018.08.080

Publishers page: https://doi.org/10.1016/j.jad.2018.08.080

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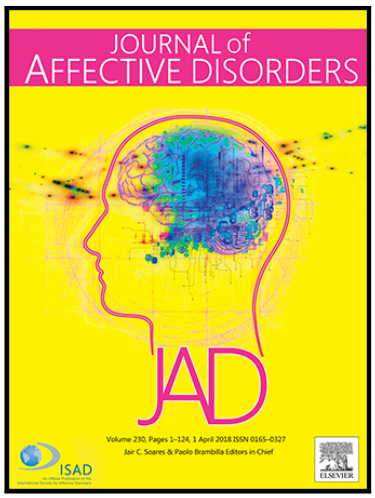

Is teachers' mental health and wellbeing associated with students' mental health and wellbeing?

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PII: S0165-0327(18)30173-3
DOI: https://doi.org/10.1016/j.jad.2018.08.080
Reference: JAD 10078

To appear in: *Journal of Affective Disorders*

Received date: 30 January 2018
Revised date: 30 July 2018
Accepted date: 15 August 2018

Please cite this article as: Sarah Harding PhD , Richard Morris PhD , David Gunnell PhD , Tamsin Ford PhD , William Hollingworth PhD , Kate Tilling PhD , Rhiannon Evans PhD , Sarah Bell PhD , Jillian Grey PhD , Rowan Brockman PhD , Rona Campbell PhD , Ricardo Araya PhD , Simon Murphy PhD , Judi Kidger PhD , Is teachers' mental health and wellbeing associated with students' mental health and wellbeing?, *Journal of Affective Disorders* (2018), doi: https://doi.org/10.1016/j.jad.2018.08.080

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Highlights

- Better teacher wellbeing is associated with better student wellbeing and with lower student psychological difficulties
- Lower teacher depressive symptoms are associated with better student wellbeing
- Teacher presenteeism and the teacher-student relationship may be mediating factors in these relationships
- There is an independent association between the quality of the teacher-student relationship, teacher presenteeism and teacher absence with student wellbeing and psychological distress.

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Is teachers' mental health and wellbeing associated with students' mental health and wellbeing? A cross sectional study.

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Abstract

Background: Factors within the school environment may impact young people's mental health and wellbeing. The aim of this study was to understand the association between teacher and student mental health and wellbeing. Further, it seeks to identify possible explanations by examining whether the strength of any association is weakened once quality of teacher-student relationships, teacher presenteeism and absence are considered.

Methods: Cross-sectional data were collected from 3217 Year 8 (aged 12-13 years) students and from 1167 teachers in 25 secondary schools in England and Wales. The association between teacher wellbeing (measured by Warwick Edinburgh Mental Wellbeing Scale (WEMWBS)) with student wellbeing (WEMWBS) and with student psychological distress (Total Difficulties Score (TDS)) was assessed using Random Effects Mixed Models. Analyses were repeated using teacher depression (measured by Patient Health Questionnaire) as the explanatory variable.

Results: Better teacher wellbeing was associated with i) better student wellbeing (standardised effect =0·07, 95% CI = 0·02 to 0·12) and ii) lower student psychological distress (standardised effect = -0·10, 95% CI = -0·16 to -0·04). Teacher presenteeism and the quality of the teacher-student relationship appeared to be on the pathway of these relationships. Higher levels of teacher depressive symptoms were associated with poorer student wellbeing and psychological distress (standardised effect =-0·06, 95% CI = -0·11 to -0·01 & 0·09, 95% CI = 0·03 to 0·15). This association did not withstand adjustment of teacher presenteeism.

Limitations: Cross sectional in design so unable to establish temporal associations.

Conclusions: Associations were found between teacher wellbeing and student wellbeing and psychological distress. There were also an association between teacher depression and student wellbeing. Both may be partially explained by teacher presenteeism and quality of teacher-student relationships.

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Introduction

The mental health of children and young people appears to be deteriorating [1]. A recent survey in England found 37% of girls and 15% of boys in Year 10 (14-15 years) were psychologically distressed [2]. Positive mental health and wellbeing during adolescence is associated with positive social relations, the development of a healthy lifestyle, reduced risk of adverse socioeconomic outcomes, psychiatric disorders, self-harm, and suicide in later life [3-5]. Almost 75% of adults with depression report that their mental health problems started in adolescence [6, 7]. Therefore, it is important to identify risk factors for poor mental health among this age group.

Factors within the school environment have been found to have an impact on young people's mental health [8]. For example, supportive teacher-student relationships are associated with lower student depression [8, 9]. The importance of a positive teacher-student relationship is supported by the findings of a systematic review and meta-ethnography [10] which found positive relationships with teachers and a feeling of safety are important for student wellbeing within schools. This is in line with theories regarding health promotion in schools. For instance, Baraic et al. [11, 12] reasoned that in order to promote healthy organisations (such as schools) there should be a focus on interactions within the organisations. Additionally, the importance of a positive teacher student relationship resonates with the explanatory framework for understanding how schools may intervene to promote students health put forward by Markham et al. [13]. This outlines that the primary focus of health promotion in schools should be the realisation for practical reasoning and affiliation with other humans. Students having a positive relationship with their teachers may contribute to school connectedness which is defined as an environment in which students believe that adults in the school care about their learning and about them as individuals [14]. This has also been linked to student wellbeing [15]. In addition to fostering good quality relationships, teachers may also contribute to student mental health and wellbeing through identification of and intervention with students at risk of mental health problems [16, 17].

Teachers themselves are consistently reported to be at increased risk of common mental health disorders compared to those in other occupations [18-20]. Poor teacher wellbeing may be problematic not only for teachers' longer term mental health [21] but also for that of their students. Teacher wellbeing and student wellbeing could be linked though complex and interrelated factors. Indeed, poor wellbeing and depressive symptoms are associated with teachers' self-rated presenteeism [20]. Which is defined as an employee under-performing at work as a result of a health problem [22] (for example a teacher having symptoms of poor physical or mental health but still being present at work). Presenteeism may have an impact on student mental health through teachers not being able to develop a positive and supportive school environment and finding it more difficult to manage classrooms effectively [23]. Additionally, teachers experiencing poor mental health and wellbeing may find it difficult to develop and model good quality relationships with students [17, 23]. They may also be linked through higher rates of teacher absence at schools which may prevent students and staff from fostering supportive relationships [10]. Furthermore, where teachers experience poor wellbeing, this reduces their belief that they can help students with emotional problems [24].

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Wellbeing covers two perspectives; firstly, the subjective experience of happiness and life satisfaction (the hedonic perspective) and secondly, positive psychological functioning, good relationships with others and self-realisation (the eudaimonic perspective) [25, 26]. Key concepts include positive affect psychological functioning (autonomy, competence, self-acceptance, personal growth) and interpersonal relationships [27]. Depression is an internalising mental disorder [28] characterized by persistent sadness and a loss of interest in activities that one normally enjoys, accompanied by an inability to carry out daily activities, for at least two weeks [29]. A large number of studies have shown that depression and wellbeing are two different constructs/dimensions of mental health [30-34] suggesting a dual-factor model. Indeed, studies have shown the that the two constructs have different causal determinants and mediating mechanisms [35] and respond to different interventions or treatments [36]. Owing to this dual-factor model, both wellbeing and depression are distinct from one another and need to be considered separately. The same is also true for student wellbeing and student psychological distress.

Despite the likelihood that teacher and student wellbeing and mental health are linked, evidence for this is currently lacking in the literature. Drawing on self-report survey data collected from teachers and year 8 students (12-13year olds), this paper investigates whether mean school-level scores for teacher wellbeing and depression are associated with individual student wellbeing and psychological difficulties. Further, it seeks to identify possible explanations by examining whether the strength of any association is weakened once the quality of teacher-student relationships, teacher presenteeism and absence are considered. Although these are possible explanations for any associations that exist, it is also possible that an association would be due to shared features of the school environment impacting on the wellbeing of both. Thus, school-level factors are included as potential confounders.

Methods

This study is cross-sectional in design and multi-level as participants were clustered within schools.

Sample

The student, teacher and school data were taken from 25 schools which are participating in the WISE project[37]. In brief, WISE is a cluster randomised controlled trial with secondary schools as the unit of randomisation. A group of teachers in intervention schools were given Mental Health First Aid training for students and a further group were given Mental Health First Aid training for colleagues. More information on the project can be found in the protocol paper [37] and on the study website (https://www.bristol.ac.uk/population-health-sciences/projects/wise/).

The schools were recruited from 4 four local authorities in the South-West of England and from 10 local authorities in South-East and South-Central Wales. They varied by size, socioeconomic catchment area and academic performance. Details of the recruitment procedure can be found in the WISE study protocol [38]. All students in school year 8 (aged 12-13 years) and all teachers currently working at the school were invited to take part.

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Results presented here are from the baseline data collection – administered prior to randomisation to the intervention or control group and prior to intervention delivery. Student and teacher data were collected via self-report surveys, administered during lesson time (students), meeting times (teachers) or via an online survey (teachers). Data collection took place in June/July 2016. School-level data were obtained from publicly available routine data sources.

Measures

Outcome measures

Student wellbeing: The Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) [27] was used to measure wellbeing. This has been validated for use in adolescents and has been shown to be reliable (test re-test score = 0.83) [39] . This scale consists of 14 items (statements) and participants were asked to tick the box which best describes their experience of each statement over the past 2 weeks using a five-point Likert scale [27]. A total score is derived from these 14 items; higher scores signify greater wellbeing (possible total score ranging from 14 to 70).

Student psychological distress: Strengths and Difficulties Questionnaire (SDQ) [40] was used to measure psychological distress. The SDQ is a brief 25-item scale covering four main domains of difficulties that can trouble adolescents (i.e., emotional symptoms, conduct problems, hyperactivity-inattention, and peer problems). A Total Difficulties Score (TDS) was derived by adding the scores from 4 sub-scales: emotional symptoms (anxiety and depressive symptoms), conduct problems, hyperactivity/inattention, and peer relationship problems. The score ranges from 0 (low difficulties) to 40 (high difficulties). This has been shown to be a valid and reliable measure for use in adolescents [40, 41]. For example, Goodman et al.[40] presented a Cronbach's alpha score of 0.82 and the results suggest that the questionnaire can discriminate between a clinical (mental health clinic) and non-clinical sample.

Explanatory variables

Teacher wellbeing: WEMWBS was used as a measure of wellbeing (described above). This has been validated for use in adults [27] (goodness of fit >0.9) and has been shown to be reliable (test re-test score =0.83).

Teacher depressive symptoms: The 8 item Patient Health Questionnaire (PHQ-8) was used to measure depressive symptoms in teachers [42]. This has been shown to be valid measure when compared to a standard diagnostic algorithm [42]. This questionnaire asks participants to rate on a 4-point scale how much they have experienced 8 depressive symptoms in the 14 days prior to evaluation.

Confounding factors

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Student socio-economic deprivation**:** Self-reported receipt of free school meals was used as a measure of individual level deprivation. Students are eligible for free school meals if their parents/guardians receive any benefits such as income support.

Ethnicity: Measured by self-report questionnaire, participants were asked "what is your ethnic group?" and the possible responses were: White, Mixed, Asian or Asian British, Black or Black British, Chinese or other ethnic group.

Quality of teacher-student relationships: This was measured via a question created by the study team. Students were asked to rate the following statement, "teachers and students generally have good relationships at this school." The score ranged from 0 (strongly disagree) to 3 (strongly agree).

Teacher absence: This was measured by asking teachers "during the last four working weeks, how many days did you miss from school because of health problems?". The four-week period was an adaptation of the WPAI Work Productivity and Activity Impairment Questionnaire (WPAI) questionnaire which asked about the last month. As data were collected shortly after the school Easter holidays it was decided to word it as four working weeks rather than one month.

Teacher presenteeism: This was measured using an adapted version of the presenteeism measure from the WPAI [(43)]. The relevant question asks participants to rate to what extent health problems have affected their productivity at work from 0 (no effect on my work) to 10 (completely prevented me from working) over the previous four working weeks. This score was only calculated for teachers with no absent days, as it is not applicable if the teacher had absent days in the previous four weeks.

School size: Number of students for each school was used as a measure of school size. Teacher-student ratio was also included in the models (number of students/number of teachers).

School-level deprivation: The percentage of students eligible for free school meals was used as a measure of school-level deprivation. These data were obtained from government websites[(44, 45)].

School performance rating: Schools' most recent report from the independent inspectorate for schools (Ofsted in England and Estyn in Wales). The potential ratings are outstanding/excellent, good, requires improvement/adequate and inadequate/unsatisfactory for England and Wales respectively. These were scored as 0, 1, 2 and 3 respectively, with outstanding/excellent (0) being using as the reference.

School region: The schools were either based in England (n=13) or Wales (n=12).

School academy status: Whether the school is an academy or not. Academies are publicly funded schools that are self-governing (as opposed to under local education authority control) and have control over their own

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finances. Wales does not have academy schools, so this only applies to the English schools. Welsh schools were marked as not being an academy.

School attainment: GCSE results (examination results for students at age 16) the year of data collection was used as an indicator for school attainment. Summary data were recorded differently for England and Wales. For the English schools, this was the percentage of pupils achieving a GCSE at A*-C in English and Maths at the year of data collection. For the Welsh schools, this was the percentage of pupils achieving A*-C (or equivalent qualification) in English/Welsh, Maths and Science. Data were obtained from government websites [44, 45]. A binary variable was created which indicated whether the school attainment was above or below average for each country.

Ethics

The study was approved by the University of Bristol's Faculty of Medicine and Dentistry Ethics Committee (reference 2852). An opt-out consent procedure was used for students whilst parents were given the opportunity to opt their child out of completing questionnaires[37].

Missing data

Published guidance [46, 47] was followed where individual items were missing on the SDQ and WEMWBS. For SDQ, the mean score for each sub-category was entered for the missing items within that sub-category, but only if ≥3 of the 5 items were completed. For WEMWBS, missing items were completed using the mean score of all other items but only if ≤3 items were missing. For the PHQ-8 scale, the mean value of the other items was used to complete the missing item if ≤1 item was missing. Once these procedures were followed, there were minimal missing data. Therefore, there was no need for statistical imputation. After following these procedures, only students with no missing data for the variables used in the models were included in the analysis of this paper – ie complete case analysis.

Statistical analysis

Data on all outcome variables were normally distributed so parametric statistics were used. Owing to the possibility of clustering within schools (n = 25), random effects mixed models were used. For each of the teacher variables (wellbeing, depressive symptoms, presenteeism and absence), individual scores within each school were combined to provide a school mean as students are taught by a range of teachers. For the teacher-student relationship variable, we did not combine the score for each school because data was collected on an individual student level.

Analyses were carried out with student wellbeing as the outcome variable and then repeated with student psychological distress as the outcome variable. Initial univariable models assessed the association between teacher wellbeing and student wellbeing/psychological distress (Model 1). Individual student variables (gender, free school meal eligibility, ethnicity) and school variables (teacher-student ratio, number of students,

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percentage of students eligible for free school meals, Ofsted/Estyn rating, academy status, school attainment and region) were then added (Model 2). As teacher presenteeism, teacher absence, and teacher-student relationship may be on the causal pathway between teacher wellbeing and student outcomes, these were added sequentially to the models, as follows:

Model 3 - Multivariable model including all individual student measures, all school-level factors, teacher wellbeing and teacher-student relationship
Model 4 - Multivariable model including all individual student measures, all school-level factors, teacher wellbeing and teacher presenteeism
Model 5 - Multivariable model including all individual student measures, all school-level factors, teacher wellbeing and teacher absence
Model 6 –Multivariable model including all individual student measures, all school-level factors and all teacher measures

The above models were repeated using teacher depression as the key explanatory variable (in place of teacher wellbeing).

School performance rating was ordinal, region and attainment were binary; the remaining variables were continuous. Standardised effects estimates were created by creating standardised values across the sample for each variable (mean=0, standard deviation =1) and the models were repeated using standardised values. Unless specified, all results here are based on the unstandardised data. Data were checked for homoscedasticity. All data were analysed using Stata Version 14.

Results

Participants

Of the 3535 eligible Year 8 students, 3409 completed the questionnaire and of these, 3216 had no missing data for the variables of interest and were thus included in the analysis (90.98% response rate). Of the 1348 teachers who were eligible, 1182 (87·69% response rate) from 25 secondary schools completed the questionnaire. Table 1 describes the sample. Of the 25 schools, 13 (52%) were based in England and 12 (48%) based in Wales, 9 (36%) of the schools were an academy, 12% of schools rated as outstanding/excellent, 32% rated as good, 44% as requires improvement/adequate and 12% rated as inadequate/unsatisfactory. 52% of the schools were below the national attainment average. The mean and standard deviation of the other variables are shown in table 2.

Table 1: Sociodemographic characteristics of student and teacher participants

		Category	n (%)
Students	Gender	Male	1521 (47·3)
		Female	1695 (52·7)
	Ethnicity	White	2730 (84·9)
		Other	486 (15·1)
	Eligible for Free School Meals	Yes	556 (17·3)
		No	2660 (82·7)
Teachers	Gender	Male	430 (36·4)
		Female	752 (63·6)
	Ethnicity	White	1130 (95·6)
		Other	43 (3.6)
	Age	≤25	77 (6·5)
		26-35	412 (34·9)
		36-45	387 (32·7)
		46-55	236 (20.0)
		56-65	65 (5·5)
		≥ 65	1 (0·1)

*9 teachers had missing data for ethnicity, 4 teachers had missing data for their age. Results are presented to one decimal places or to the nearest significant figure.

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Table 2: Mean and standard deviation of the continuous variables included in models (student, teacher and school variables)

Variable	Mean (SD)
Student wellbeing (WEMBWS), range=14-70	47·37 (9·24)
Student psychological difficulties (TDS), range = 0-40	19·43 (5·99)
Teacher-student relationship, range = 0 -3	1·78 (0·65)
Teacher wellbeing (Warwick Edinburgh Mental Wellbeing Scale), range 14-70	46·81 (8·41)
Teacher depression (PHQ-8), range = 0-24	6·37 (4·92)
Teacher presenteeism, range = 0-10	2·04 (2·36)
Teacher absence (number of absent days in the previous 4 weeks)	0·44 (1·75)
Number of students at the school	869·28 (264·56)
Percentage of pupils eligible for free school meals at the school	18·80 (10·39)
School teacher student ratio	14·76 (3·10)

*SD = standard deviation, WEMBWS = Warwick Edinburgh Mental Wellbeing Scale, TDS = Total Difficulties Score, PHQ =patient health questionnaire, teacher-student ratio = number of students/number of teachers), teacher presenteeism: teachers rated the extent to which health problems have affected their productivity at work from 0 (no effect on my work) to 10 (completely prevented me from working). Results are presented to 2 decimal places or to the nearest significant figure

Association between teacher wellbeing and student wellbeing

In the univariable model, better teacher wellbeing was associated with better student wellbeing (B=0·35, 95% CI = 0·08 to 0·63) equivalent to a standardised effect of 0·07. This association remained after individual student factors and school-level factors were adjusted for (B=0·37, 95% CI =0·05 to 0·68); equivalent to a standardised effect of 0·07. This association remained but was weakened slightly with the addition of the teacher-student relationship to the model (B=0·33, 95% CI = 0·05 to 0·61). The association remained when teacher absence was included (B=0·39, 95% CI = 0·09 to 0·69). However, the association was disappeared when teacher presenteeism was added to the model (B=0·11, 95% CI = -0·22 to 0·45) and in the fully adjusted model (B=0·08, 95% CI = -0·22 to 0·38), suggesting that teacher presenteeism may be on the pathway between teacher and student wellbeing. Results shown in table 3.

In the fully adjusted model, better-quality teacher-student relationships was associated with better student wellbeing (B=3·86, 95% CI = 3·40 to 4·32) and higher teacher presenteeism and teacher absence were

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associated with poorer student wellbeing (B=-2·19, 95% CI = -3·50 to -0·88, B=-2·02, 95% CI = -3·25 to -0·79 respectively). Results shown in table 1 supplementary material.

Association between teacher wellbeing and student psychological distress

There was a crude inverse association between teacher wellbeing and student psychological distress (B=-0·35, 95% CI = -0·56 to -0·14) equivalent to a standardised effect of -0·10. This association remained after individual student factors and school-level factors were included in the model (B=-0·20, 95% CI = -0·41 to -0·02); this is equivalent to a standardised effect of -0·06. The association remained with the inclusion of teacher absence in the model (B=-0·22, 95% CI = -0·42 to -0·03). The association was weakened slightly with the inclusion of quality of teacher-student relationships in the model (B= -0·19, 95% CI = -0·37 to -0·003). Teacher presenteeism appeared to be on the pathway between teacher wellbeing and student psychological distress as the association did not remain when teacher presenteeism was included in the model (B=-0·06, 95% CI = -0·29 to 0·17 and B=-0·02, 95% CI = -0·22 to 0·17, with teacher presenteeism included in the model (model 4) and the fully adjusted model, respectively). Results shown in table 3.

In the fully adjusted model (table 1 supplementary material), a better teacher-student relationship was associated with lower student psychological distress (B=-1·71, 95% CI = -2·01 to -1·41). Higher teacher presenteeism and higher teacher absence were associated with higher student psychological distress (B=1·39, 95% CI = 0·53 to 2·25, B=1.39, 95% CI = 0·58 to 2·19).

Association between teacher depressive symptoms and student wellbeing

There was a crude inverse association between teacher depressive symptoms and student wellbeing (B=-0·60, 95% CI = -1·15 to -0·05), which is equivalent to a standardised effect of -0·06. This association remained when individual student factors and school-level factors were adjusted for (B=-0·52, 95% CI = -1·07 to 0·03), when the quality of the teacher-student relationship was included (B=-0·56, 95% CI = -1·04 to -0·09), and when teacher absence was included (B=0·53, 95% CI = -1·06 to -0·005); these are equivalent to standardised effect of -0·05. The association between teacher depression and student wellbeing did not withstand when teacher presenteeism was included in the model (B=-0·04, 95% CI =-0·61 to 0·54). Results are shown in table 4.

In the fully adjusted model, higher teacher presenteeism was associated with poorer student wellbeing (B= 2·35, 95% CI = -3·71 to -0·99) and a better-quality teacher-student relationship was associated better student wellbeing (B=3·86, 95% CI =3·39 to 4·32) - see table 2 supplementary material.

Association between teacher depressive symptoms and student psychological distress

There was a crude association between teacher depressive symptoms and student psychological distress (B=0·63, 95% CI = 0·21 to 1·05), which is equivalent to a standardised effect of 0·09 (Table 4). However, this association was attenuated once individual student factors and school-level factors were included in the model

(B=0·25, 95% CI = -0·11 to 0·61), when the quality of the teacher-student relationship was included (B=0·27, 95% CI= -0·06 to 0·59) and when teacher absence was included in the model (B=0·25, 95% CI = -0·09 to 0·60). The association did not withstand adjustment for teacher presenteeism (B=-0·04, 95% CI = -0·43 to 0·35) nor did it remain in the fully adjusted model (B=-0·13, 95% CI = -0·47 to 0·21).

In the fully adjusted model, the teacher-student relationship, teacher presenteeism and teacher absence were associated with student psychological distress (B=-1·70, 95% CI = -2·01 to -1·40, B=1·65, 95% CI = 0·77 to 2·54, B=1·49, 95% CI = 0·66 to 2·31 respectively) - see table 2 supplementary material.

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Table 3: Associations between teacher wellbeing and i) student wellbeing ii) student psychological distress

		Student wellbeing Unstandardized coefficients (B (95% CI))	Psychological distress Unstandardized coefficients (B (95% CI))
Crude association (model 1)		0.35 (0.08-0.63)	-0·35 (-0·56 to -0·14)
Adjusted for:	Individual student factors +school-level factors (model 2)	0·37 (-0·05 to 0·68)	-0·20 (-0·41 to -0·02)
	Individual student factors +school-level factors + teacher-student relationship (model 3)	0·33 (0·05 to 0·61)	-0.19 (-0.37 to-0.003)
	Individual student factors +school-level factors + teacher presenteeism (model 4)	0.11 (-0.22 to 0.45)	0·06 (-0·29 to 0·17)
	Individual student factors +school-level factors + teacher absence (model 5)	0·39 (0·09 to 0·69)	-0.22 (-0.42 to -0.03)
	Fully adjusted model (model 6)	0.08 (-0.22 to 0.38)	-0.02 (-0.22-0.17)

Results are presented to 2 decimal places or to the nearest significant figure. CI = confidence interval, *individual student factors include: gender, eligibility for FSM (free school meals) and ethnicity, school-level factors include: number of student at school, teacher-student ratio, school performance rating, percentage of pupils eligible for FSM, academy status, school region and school attainment. N=3216

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Table 4: Association between teacher depression and i) student wellbeing ii) psychological distress

		Student wellbeing Unstandardized coefficients (B (95% CI))	Psychological distress Unstandardized coefficients (B (95% CI))
Crude association (model 1)		-0.60 (-1.15 to -0.05)	0.63 (0.21 to 1.05)
Adjusted for:	Individual student factors +school-level factors (model 2)	-0.52 (-1.07 to 0.03)	0.25 (-0.11 to 0.61)
	Individual student factors +school-level factors + teacher-student relationship (model 3)	-0.56 (-1.04to-0.09)	0.27 (-0.06 to 0.59)
	Individual student factors +school-level factors + teacher presenteeism (model 4)	-0.04 (-0.61 to 0.54)	-0.04 (-0.43 to 0.35)
	Individual student factors +school-level factors + teacher absence (model 5)	-0.53 (-1.06 to 0.005)	0.25 (-0.09 to 0.60)
	Fully adjusted model (model 6)	-0.02 (-0.55 to 0.51)	-0.13 (-0.47 to 0.21)

Results are presented to 2 decimal places or to the nearest significant figure. CI = confidence interval, *individual student factors include: gender, eligibility for FSM (free school meals) and ethnicity, school-level factors include: number of student at school, teacher-student ratio, school performance rating, percentage of pupils eligible for FSM, academy status, school region and school attainment. N=3216

Discussion

The results of this paper suggest that better teacher wellbeing is associated with better student wellbeing and with lower student psychological difficulties as well as lower teacher depressive symptoms being associated with better student wellbeing. The findings also suggest that teacher presenteeism and the teacher-student relationship may be mediating factors in these relationships. Additionally, the results show an association between the quality of the teacher-student relationship, teacher presenteeism and teacher absence with student wellbeing and psychological distress.

The associations between teacher wellbeing and depressive symptoms, and student wellbeing and distress were weakened when teacher presenteeism was included in the models. Kidger et al. [(20)] found that poor teacher wellbeing was associated with high teacher presenteeism, and the current study found an association between teacher presenteeism and student wellbeing and psychological difficulties. Therefore, it may be that teacher presenteeism is on the causal pathway between teacher and student mental health. Poor wellbeing and higher

levels of depressive symptoms may lead to teachers under performing at work, [48, 49] which may affect student wellbeing and psychological distress. For example, teachers may be less able to engage in positive classroom and behaviour management [23] or be more likely to display negative emotions or behaviours [50].

This study found that a better teacher-student relationship is associated with better student wellbeing and with lower student psychological distress. This resonates with previous studies. For example, Cornelius-White [51] showed in a meta-analysis that positive teacher-student relationships are associated with positive student outcomes (affective, behavioural and cognitive), and studies have also shown that supportive teacher-student relationships predict lower student depression [8, 52]. It also resonates with the results of Sisask et al. [24], which suggested that poor wellbeing reduces teachers' belief that they can help students with emotional or behavioural problems. A potential explanation for this association is that students who have a better relationship with their teachers may have higher levels of connectedness and belongingness with their school, which has previously been associated with higher levels of student wellbeing [15]. The results reported here indicate that the quality of teacher-student relationships may partially explain the association between teacher wellbeing and student psychological difficulties: teachers with poor wellbeing may be less able to develop supportive relationships[23, 53].

A positive teacher-student relationship is also likely to be important for teacher wellbeing [54-56]. Hargreaves' [56] qualitative study of teachers in Canada found that teachers' relationships with their students was an important source of enjoyment, motivation and positive emotions. Split et al. [54] outlined the importance of the teacher-student relationship for teacher wellbeing, suggesting it may in part be explained by teachers' need for relatedness (the need to feel related/connected) with their students. Additionally, Milatz et al. [55] found an association between emotional exhaustion in teachers and quality of relationships with students. Thus, the findings of this and previous studies suggest that a focus on improving the teacher-student relationship may have a positive impact on both student and teacher wellbeing. While teacher absence was associated with students' wellbeing and psychological distress, it does not appear to be on the explanatory pathway between teacher and student outcomes.

The relationships between teacher wellbeing, the quality of teacher-student relationships, teacher presenteeism and student mental health outcomes are clearly complex and likely to be inter-related. The results of this study suggest that improving teacher wellbeing may lead to better student wellbeing via more supportive relationships or reduced teacher presenteeism. It is important to note that this is a cross-sectional study and longitudinal or randomised controlled trials are needed to understand these relationships further. However, if additional research supports these results this could have implications for practice such as informing the development of a school-level intervention, which aims to improve the mental health and wellbeing of teachers and students within secondary schools.

It is worth noting that the effect sizes in this paper are small. For example, the crude association between teacher depression and student wellbeing (-0.60 (-1.15 to -0.05)) is interpreted as every 1 unit change in teacher depression is associated with a 0.60 change in student wellbeing on a scale where the score can range from 14 to

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70. This may appear small when on an individual level. However, it may be meaningful or practically important at a population level [57]. If a public health intervention were to shift a whole distribution in a favourable direction this could have favourable effects on the on a population despite only a small change on an individual level [57].

Strengths and limitations

This is the first study to examine the association between teacher wellbeing and depressive symptoms, with student wellbeing and psychological distress. The outcome measures used have been shown to have good reliability and validity [27]. The study includes a large and representative sample recruited from 25 different schools in England and Wales, which were stratified at the sampling stage to ensure a representative range of socioeconomic catchment areas. Both teacher and student response rates were high. There were minimal missing data, so the likelihood of sample bias is low.

The study is limited by the cross-sectional design. Thus, it is impossible to establish the temporal direction of any associations, which could conceivably operate in both directions. Longitudinal studies or randomised controlled trials are needed to further understand the association between teacher and student wellbeing, and the extent to which it is explained by the quality of teacher-student relationships and teacher presenteeism. School-level mean scores were used for the teacher-related variables. This was for the pragmatic reason that students at secondary school are taught by several teachers and we cannot identify which students are taught by which teachers. However, it meant that these data were limited to 25 data points, and therefore had less statistical power to identify associations. Additionally, the measure of teacher-student relationship was developed for the WISE project and has not been tested for validity or reliability. Finally, student and teacher measures were self-reported. The responses for teacher absence and teacher presenteeism may have been influenced by recall bias. Further, students with poor wellbeing may be more likely to rate other aspects of school negatively, which could partially explain some of the results, such as the association between student wellbeing and the teacher-student relationship.

Conclusions

This paper demonstrates cross-sectional associations between teacher wellbeing and depression, and student mental health and wellbeing outcomes. These associations appear at least in part to be due to the quality of teacher-student relationships and teacher presenteeism. Therefore, interventions to improve these aspects of school life, possibly by addressing teacher wellbeing and symptoms of depression, may improve outcomes for students. However, longitudinal studies are needed to understand these associations more fully.

Acknowledgements

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The study team thanks the teachers and students who gave up their time so willingly to complete the questionnaires. We thank all staff members who assisted with data collection alongside Harriett Fisher and Camilla Sapsworth for management of the participant lists. We are also thankful for the support of Bristol Randomised Trials Collaboration, a UKCRC-registered unit in receipt of NIHR support. This project was funded by the National Institute for Health Research Public Health Research (NIHR PHR) Programme. The views and opinions expressed therein are those of the authors and do not necessarily reflect those of the NIHR PHR Programme or the Department of Health.

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