

BMJ Open

BMJ Open is committed to open peer review. As part of this commitment we make the peer review history of every article we publish publicly available.

When an article is published we post the peer reviewers' comments and the authors' responses online. We also post the versions of the paper that were used during peer review. These are the versions that the peer review comments apply to.

The versions of the paper that follow are the versions that were submitted during the peer review process. They are not the versions of record or the final published versions. They should not be cited or distributed as the published version of this manuscript.

BMJ Open is an open access journal and the full, final, typeset and author-corrected version of record of the manuscript is available on our site with no access controls, subscription charges or pay-per-view fees (<http://bmjopen.bmj.com>).

If you have any questions on BMJ Open's open peer review process please email info.bmjopen@bmj.com

BMJ Open

Healthcare employee engagement and healthcare service quality ratings: analysis of the 2012–2016 National Health Service staff surveys and the concurrent Care Quality Commission outcomes

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2018-026472
Article Type:	Research
Date Submitted by the Author:	14-Oct-2018
Complete List of Authors:	Wake, Mark; University Hospitals of Leicester NHS Trust, ENT Green, William; University of Leicester School of Management
Keywords:	CQC, Engagement, secondary care



TITLE

Healthcare employee engagement and healthcare service quality ratings: analysis of the 2012–2016 National Health Service staff surveys and the concurrent Care Quality Commission outcomes

Authors

Mark Wake[1], William Green[2]

Author Affiliations

[1] Leicester Royal Infirmary: ENT Department (mark.wake@uhl-tr.nhs.uk)

[2] University of Leicester: Associate Professor; Innovation, Operations & Knowledge Management (wg32@leicester.ac.uk)

Correspondence

drmarkwake@aol.com

Abstract

Objective This research looks at measures of employee engagement in NHS acute Trusts in England and tests the association between organization-level engagement and the CQC's quality ratings.

Design Cross-sectional.

Setting 97 acute NHS Trusts in England.

Participants 97 NHS acute Trusts in England (2012–2016). Data includes provider details, staff survey results and CQC reports. Hybrid Trusts or organizations affected by recent mergers are excluded.

Outcome Measures Analysis uses organization-level employee engagement and CQC quality ratings.

Results Employee engagement is affected by organizational factors, including patient bed numbers ($\beta=-0.46$, $p<0.05$) and financial revenue ($\beta=0.38$, $p<0.05$). CQC ratings are predicted by overall employee engagement score ($\beta=0.57$, $p<0.001$) and financial deficit ($\beta=-0.19$, $p<0.05$). The most influential employee engagement dimension on provider ratings is 'advocacy' ($\lambda=0.54$, $p<0.001$). Analysis support the notion that employee engagement can be predicted from advocacy scores alone (eigenvalue=4.03). Better still, combining advocacy scores from the previous year's survey or adding in motivation scores is a highly reliable indication of overall employee engagement (95.4% of total variance).

Conclusions NHS acute Trusts with high employee engagement scores tend to have

1
2
3 better CQC ratings. Trusts with a high financial deficit tend to have lower ratings.
4
5 Employee engagement subdimensions have different associations with CQC ratings,
6
7 the most influential dimension being advocacy score. A two subdimension model of
8
9 engagement efficiently predicts overall employee engagement in NHS acute Trusts in
10
11 England. Healthcare leaders should pay close attention to the proportion of employees
12
13 who would recommend their organization as a place to work or receive treatment,
14
15 because this is a proxy for the level of engagement and it predicts CQC ratings.
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Article Summary

Strengths and limitations of this study

- Data is from a large national employee survey. A study investigating the link between measures of employee engagement and perceived quality in secondary healthcare providers.
- The employee engagement results coincide with the first national inspection programme of acute NHS Trusts, by the CQC.
- A conceptual model is used to test the associations between the subdimensions of employee engagement and perceived quality (as measured by the CQC).
- The predictor variables are taken from a single self-reported source which risks common method variance.
- The sample and cross-sectional design limit conclusions about causation or generalizability.

Introduction

This study considers organization-level measures of work engagement taken from the annual National Health Service (NHS) staff surveys (NSS) 2012–2016.[1] It examines the effect that organizational size, status and financial revenue have on overall engagement and compares engagement scores to Care Quality Commission (CQC) ratings for NHS acute Trusts in England. Employee engagement research typically uses a multidimensional construct of engagement, so the study applies this approach to the NHS. It investigates the associations between engagement subdimensions and the perceived quality of provider organizations.

Organizational factors

The structure of healthcare organizations has been linked to measures of performance such as efficiency, patient outcomes, staff and patient satisfaction. [2-3] There has been an inference that as far as improving outcomes of healthcare are concerned, “bigger is better” but the evidence for such a general assertion is weak.[4] In the United Kingdom (UK), employee recruitment and retention has historically been easier in large, prestigious teaching hospitals based in cities or Foundation Trusts with large numbers of inpatient beds and considerable resources at their disposal. In the broadest sense, resources promote employee engagement and well-being and to some extent protect workers from the demands of their jobs.[5] Previous healthcare studies have also shown that the type of organization and available job resources are linked to engagement levels amongst nurses, doctors and other healthcare professionals in several countries.[6-8]

1
2
3 This research examines the results of recent NHS staff surveys for evidence that
4 employee engagement is linked to organizational characteristics. We follow on from
5 the work of West et al.[9] and West and Dawson[10] to construct the following
6 hypothesis (H1):
7
8
9
10
11

12 *H1: NHS employee engagement will be related to Trust size, type (Foundation/non-*
13 *Foundation), status (teaching/non-teaching hospital) and financial position.*
14
15
16

17
18
19 *Employee engagement and performance (CQC ratings)*
20

21 The proposition that employee engagement has a positive effect on organizational
22 performance is not new.[11] Employee engagement has been associated with
23 improved performance in many industries albeit there is limited healthcare evidence.
24 Engaged employees tend to be intrinsically motivated, are more likely to achieve
25 goals and learn from mistakes, which can affect organization-level quality
26 outcomes.[12-14] For example, healthcare organizations with more engaged
27 employees tend to deliver better patient care and have superior safety records
28 compared to those with less engaged employees.[12]
29
30
31
32
33
34
35
36
37
38
39

40 One controversial measure of NHS performance is the use of CQC healthcare
41 provider ratings by the Department of Health and Social Care. In 2016, the CQC
42 completed the first national inspection programme of NHS acute Trusts in England
43 and rated each organization as: outstanding, good, requires improvement or
44 inadequate. Some variation was attributed to organizational factors such as culture,
45 leadership and staff engagement.[15] It follows therefore that employee engagement
46 is worth investigating as a predictor of CQC ratings. This study compares CQC
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 measures of performance in NHS acute Trusts with their NSS employee engagement
4 scores, based on our second hypothesis (H2):
5
6
7

8 *H2: Overall employee engagement scores taken from staff surveys in NHS acute*
9 *Trusts predict their CQC ratings.*
10

11 *Employee engagement dimensions*

12
13

14
15
16
17 The NSS attempts to reflect employee engagement in the context of the organization
18 and its environment, with overall-engagement scores synthesized from three
19 subdimension scales: motivation, advocacy and involvement. NSS motivation is similar
20 to psychological engagement and includes elements of intrinsic motivation, dedication
21 and absorption at work. Advocacy is strongly linked to care standards and reflects the
22 perceptions that staff have of the organization's patient-centredness and the level of
23 pride they feel at work. It also reflects the willingness to recommend the organization
24 as an employer or healthcare provider. Involvement is a "practitioner" measure which
25 covers employee involvement in decision-making, change management and
26 relationships with supervisors.[10]
27
28
29
30
31
32
33
34
35
36
37
38
39
40

41 Employee engagement is generally considered to be multidimensional, linked to levels
42 of energy, dedication, involvement, intrinsic motivation, absorption and connection to
43 others. Schaufeli and Bakker[13] defined engagement as a "positive, fulfilling, work-
44 related state of mind characterized by vigor, dedication and absorption". This three-
45 dimension construct has been widely adopted; indeed Simpson[7] recommended it be
46 applied to all nurse-related engagement research in order to provide a comparative
47 approach. Vigour was associated with energy, resilience, persistence and greater effort
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 which relates to the NSS motivation dimension. Dedication was characterized by
4 involvement and associated with a personal sense of significance, pride, inspiration
5 and challenge which can be linked to the NSS involvement and advocacy dimensions.
6
7

8
9 The third sub-dimension (absorption) is difficult to link to NSS instruments.
10

11
12 Recent studies have suggested that employee engagement is better represented by a
13 two-subdimension model. For example, Salanova et al.[16] published a report in which
14 only two of Schaufeli and Bakker's[13] dimensions predicted employee engagement,
15 namely vigour and dedication. In Salanova et al.'s study, absorption was considered a
16 consequence of employee engagement not an antecedent. This debate about the
17 antecedents of employee engagement informs our third hypothesis (H3) which is:
18
19
20
21
22
23
24
25

26
27 *H3: Engagement is calculated from three subdimension scales in current NHS survey*
28 *instruments. The associations between these subdimensions and overall engagement*
29 *should identify the 'core dimensions' for NHS employees. (Figure 1)*
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Methods

Organization type reportedly has an effect on NSS.[10] For consistency, this research focuses on NHS acute Trusts, whilst organizations in unusual circumstances (recent mergers, acquisitions or significant reconfigurations) and hybrid organizations (mixed community and acute services) are excluded. The resulting sample is 97 NHS acute Trusts in England. This study does not include NHS services in the rest of the UK, as they fall under different regulatory arrangements. Although this study uses Trust-level data, representativeness and comparability are assumed because a weighting procedure is applied to NSS returns based on a hypothetical national staff profile for each type of organization. To allow for historical comparisons, data weighting is regularly reviewed.[17]

Organization characteristics

All data is publicly available in the UK on NHS acute Trust websites, including NHS Trust Board papers and quality accounts. Organizational characteristics are selected to reduce confounding effects. For example, acute Trusts in England have a wide range of operating incomes that directly affects available resources. Trusts with significant financial deficits can have constraints on resources so the size of Trust deficit as a percentage of financial turnover is controlled. Although bed numbers are an indicator of organizational size, it may also reflect an element of work intensity, and so could affect performance. Teaching hospitals affiliated to reputable academic organizations have been associated with higher performance, so teaching status was also controlled for in the analysis.[2-3] 'Foundation Trust' status was originally awarded to higher-performing NHS organizations and was intended to give them more autonomy and greater financial

1
2
3 flexibility; and therefore is likely to impact on culture, climate and resources.
4
5

6 *Engagement and performance (CQC ratings)* 7

8 NHS acute Trust data was extracted from NSS reports. For each Trust, survey data
9
10 corresponding to the year of their CQC inspection and the previous year is used. The
11
12 mean average annual response rate for acute Trusts for 2012–2016 is: 49% (2012–13),
13
14 42% (2013–14), 41% (2014–15) and 43% (2015–16) respectively, comprising between
15
16 269,000 and 456,000 respondents per survey year.
17
18

19
20 Overall employee engagement for each respondent is created by taking the mean
21
22 average from the dimension scores (Cronbach's alpha=0.70). Trust-level engagement
23
24 scores are summarized for each organization using the weighting procedure described
25
26 above. Organization scores are then compared to the national average for
27
28 organizations of a similar type. Benchmark data is obtained from the summary reports
29
30 provided to individual NHS Trusts.[17]
31
32
33

34
35 The CQC inspected all 136 acute Trusts and 17 specialist Trusts in England in the
36
37 period September 2012–June 2016 and published the results on their website. This
38
39 included a total of 265 non-specialist hospital sites or locations and 27 specialist
40
41 hospitals operated by these Trusts. Assessment of core health services included:
42
43 children and young people, intensive/critical care, maternity and gynaecology, end of life
44
45 care, outpatients and diagnostic imaging, surgery, urgent and emergency services and
46
47 medical care including older people. In making their assessments, the CQC uses a set
48
49 of 150 indicators obtained from various sources (including inspection visits). They rate
50
51 organizations under five domains (safe, effective, caring, responsive and well-led). Each
52
53 organization receives an overall rating as: outstanding, good, needs improvement or
54
55
56
57
58
59
60

1
2
3 inadequate.[15] (Supplementary Table 1)
4
5

6 *NSS dimensions of employee engagement*
7

8
9 As discussed, a three subdimension model of employee engagement is captured in the
10
11 NSS. Each dimension is scored across a number of items, using a five-point scale or
12
13 yes/no answers. Data is collated by the Picker Institute, who then produce individual
14
15 Trust reports.[17] (Table 1)
16
17

18
19
20
21 **Table 1: The NHS staff survey calculates overall engagement from three scales: motivation, advocacy and involvement.**
22
23

24
25

Dimension	Description
Motivation	Staff motivation at work (Cronbach's alpha=0.81)
Advocacy	Recommend the organization as a place to work or receive treatment (Cronbach's alpha=0.74).
Involvement	Ability to contribute towards improvement at work (Cronbach's alpha=0.86).

26
27
28
29
30
31
32
33
34
35
36
37

38
39
40
41 *Patient and Public Involvement*
42

43 Patients and public were not involved in this study.
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Results

Employee engagement is treated as an organization-level variable. Scatter plots of standardized residuals show a roughly rectangular distribution with central clustering, so the assumption of linearity is met. There is no evidence of a systematic pattern of residuals and there are no residuals outside the accepted range for Trust-level data. Only two organizations have Mahalanobis distances greater than the critical value (e.g. $\chi^2=18.47$ for 4 degrees of freedom) which is around the 2% recommended tolerance. Similarly, Cook's distances are <1 , so the outliers do not have an undue influence on the predictability of the model. As a result, no acute Trusts with complete data sets are excluded.

Organizational factors and employee engagement

Employee engagement is compared to Trust size (financial turnover, bed numbers), type (Foundation/non-Foundation) and teaching status (teaching/non-teaching hospital). Univariate analysis of variance (Anova) shows that the model is statistically significant compared to chance ($p<0.05$). Regression analysis is used to quantify the % variance in employee engagement explained by the predictor variables ($R^2=0.104$, adjusted $R^2=0.064$, standard error=0.09). This suggests that the combined predictors explain 6-10% of the variance. The significant contributions are bed numbers ($\beta=-0.46$, $p<0.05$) and financial turnover ($\beta=0.38$, $p<0.05$).

Employee engagement and performance (CQC ratings)

The data is analyzed using hierarchical multiple regression: block 1 comprises control variables (financial deficit as % turnover, bed numbers, and Trust status) and block 2 Trust engagement scores (Supplementary Table 2).

In this way, the model assesses the contributions of predictor variables to the variance in the dependent variable. The model is a statistically significant predictor of CQC ratings (Anova; $F=11.42$, $p<0.001$). The combined effect of the model's variables is 39% of CQC ratings variance. The control variables account for approximately 10% of CQC ratings. The change in R^2 (ΔR^2) in block 2 shows that engagement scores account for an additional 29% of variance ($p<0.001$, standard error=0.53). The statistically significant predictors are financial deficit ($\beta=-0.19$, $p<0.05$) and engagement score ($\beta=0.57$, $p<0.001$). The regression coefficients are shown in Table 2.

Table 2: Hierarchical multiple regression – the conceptual model predicts CQC ratings. Engagement scores and Trust financial deficits are the significant predictors.

	Unstandardized coefficients		Standardized coefficients	Change statistics			
	R	R ²	Adjusted R ²	Std.error	ΔR^2	ΔF	p value
Controls ^{a,b}	0.312	0.097	0.057	0.638	0.097	2.423	.054
Full model ^{a,c}	0.625	0.391	0.357	0.527	0.294	42.891	<0.001***

a. Dependent variable: CQC rating; * $p<0.05$, ** $p<0.005$, *** $p<0.001$

b. Predictors: (Constant), Deficit %, FT or non FT, Teaching status, Bed numbers

c. Predictors: (Constant), Deficit %, FT or non FT, Teaching status, Bed numbers, Engagement score

Employee engagement dimensions and perceived performance

Discriminate analysis is used to assess the ability of the employee engagement dimension scores to predict CQC ratings (Supplementary Table 3). The assumption of multivariate normality is met with Box's M, $p > 0.05$. Univariate Anova suggests a statistically significant difference between the three engagement dimensions. Canonical discriminate functions show a statistically significant relationship between the discriminating function (1) and the engagement subdimension scores. The (eigenvalues) canonical correlation=0.67, demonstrating good group separation by a discriminate function. That function explains 95.7% of the variance between the engagement dimensions ($\lambda=0.54$, $p < 0.001$). Analysis shows that the factor driving discriminate function 1 is advocacy score, with the largest absolute correlation=0.96 (Table 3).

Table 3: Discriminate analysis – the intercorrelations and correlations between engagement subdimensions and CQC ratings can be represented by a non-correlated discriminate function (Function 1).

Function	Eigenvalue	% of variance	Cumulative %	Canonical correlation
1	0.801	95.7	95.7	0.667
2	0.036	4.3	100.0	0.185
3	0.000	0.0	100.0	0.020

Core dimensions of employee engagement in the NHS

Principal component analysis is used to test for a latent effect using data from the year of and the year before (Yb4) CQC inspections. Standard assumptions are met (sample >10 subjects per variable, strong intercorrelations $r>0.3$, Bartlett's test $p<0.001$, Kaiser Myer Olkin=0.76). The component matrix supports retaining a 1-factor solution since only 1 component had eigenvalue>1. The retained factor is advocacy score (eigenvalue=4.03), which explains approximately 67% of the total variance in the engagement data. By adding advocacy scores from the year before CQC inspections this increases to 80%. Combined advocacy and motivation scores from both years explain 95% of the total variance (Table 4).

Table 4: Principal component analysis – advocacy scores from the year of and year before CQC inspections effectively predict employee engagement. Combined advocacy and motivation scores are a reliable indicator of overall engagement which can be efficiently represented by a two dimension model.

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1.Advocacy	4.033	67.223	67.223	4.033	67.223	67.223
2.AdvocacyYb4 ^a	0.748	12.462	79.684	-	-	-
3.Motivation	0.545	9.088	88.772	-	-	-
4.MotivationYb4 ^a	0.398	6.629	95.401	-	-	-
5.Involvement	0.182	3.042	98.442	-	-	-
6.InvolvementYb4 ^a	0.093	1.558	100.000	-	-	-

^aYb4 = year before CQC inspection

Discussion

Simpson emphasized how organizational factors, job attributes and leader behaviours affected the engagement of nurses.[7] However, our findings emphasize that nuancing is required over any notion that organizational structure has a strong effect. Our analysis shows that Trust size, type and status explain 6-10% of the variance in engagement scores which only partially supports our first hypothesis. Although the size of NHS acute Trusts is related to engagement scores, the two indicators of organizational size had opposite associations. Trusts with higher incomes (turnover) tended to have more engaged employees but organizations with more beds had lower engagement. Parsimoniously, we speculate that the most influential organizational factors on engagement are related less to structure and more to employees' perceptions of the culture, leadership style and their working environment.[18]

Conceptual models tend to consider engagement in terms of job demands, job resources and personal resources[14,19-20]. In this context, the demands of a job or the available resources extend beyond: management styles, work intensity, materials or equipment, to include: employee autonomy, social support, optimism, coaching, feedback, personal development, self-efficacy and self-esteem. Adequate resources are an important motivational force at work because they reduce the perceived demands of a job, particularly when work intensity is consistently high.[21] Maumo et al.[6] reported that the loss of these resources can produce a downward spiral, particularly when employees sense a loss of autonomy or the inability to control aspects of their work.

There is growing interest in workplace factors that influence employee engagement due to the apparent effect that engagement has on organization-level performance and

1
2
3 personal well-being. Reported benefits to businesses included: improved productivity,
4 profitability and customer satisfaction.[14,19,22-23] Engagement research in healthcare
5
6 settings tends to focus on health outcomes or quality metrics rather than business
7
8 performance. For example, West and Dawson (2012) reported that levels of employee
9
10 engagement predicted hospital quality ratings (in addition to mortality, infection rates,
11
12 patient satisfaction and absenteeism). However, these studies were based on survey
13
14 data from 2008-2009. Although the regulatory regime and some of the outcome
15
16 measures have changed, our study suggests that the link between employee
17
18 engagement and quality ratings has been maintained in UK secondary care
19
20 providers.[10]. This finding supports our second hypothesis and is consistent with
21
22 reports from many different industries of a positive link between engaged employees
23
24 and improved performance.
25
26
27
28
29

30 Engagement is generally considered to be a multidimensional construct[13] and,
31
32 adopting this approach, the NSS uses a three subdimension model to assess overall
33
34 engagement. This study suggests that advocacy is the most influential dimension on
35
36 CQC ratings. Better ratings tended to occur in organizations where employees thought
37
38 the care of patients or service users was the organization's top priority and when they
39
40 would recommend their organization as a place to work or receive treatment. This
41
42 supports our third hypothesis and is consistent with CQC[15] which reported that "staff
43
44 in Trusts that have received higher ratings tend to recommend their organisation as a
45
46 place to work and/or receive treatment". Analysis suggests that advocacy scores
47
48 explain most of the variance in overall engagement scores. This implies that NHS
49
50 employee engagement could be efficiently predicted by simply determining advocacy
51
52
53
54
55
56
57
58
59
60

1
2
3 scores in future surveys. Alternatively, overall engagement could be reliability assessed
4
5 by using a two subdimension model of engagement (advocacy plus motivation). This is
6
7 consistent with Salanova et al.[16] and Maumo et al.[6] who reverted to a two-dimension
8
9 model of engagement, concluding that vigour and dedication were the core dimensions
10
11 of engagement in healthcare workers.
12
13

14 The CQC highlights that financial pressures in provider organizations are associated
15
16 with lower quality ratings, which is supported by the finding in our study: NHS acute
17
18 Trusts with higher financial deficits as a proportion of their turnover tend to achieve
19
20 lower CQC ratings. Although the CQC reported that good internal financial management
21
22 is linked with better hospital ratings, this should be taken in the context of the prevailing
23
24 external environment (particularly the pressure to control costs and prioritize
25
26 effectiveness). CQC ratings do not decipher between organizations that are “better at
27
28 balancing their budgets” and the root causes of the financial “deficits” in challenged
29
30 Trusts.[15] There are widespread calls for investment in the NHS but it remains to be
31
32 seen what level of investment is needed to produce a ‘quality dividend’ for people
33
34 receiving treatment in secondary care providers.
35
36
37
38

39 *Conclusion*

40
41
42 This study provides further empirical evidence of the positive effect that employee
43
44 engagement has on the perceived performance of healthcare organizations. NHS acute
45
46 Trusts with more engaged employees tend to have better CQC ratings. This research
47
48 also provides new evidence that the NSS engagement dimensions have different
49
50 associations with these ratings. Specifically, it shows that the most influential predictor
51
52 of CQC ratings is advocacy score (employees think the care of patients and service
53
54
55
56
57
58
59
60

1
2
3 users is the organization's top priority, they would recommend their organization to
4
5 others as a place to work and would be happy with the standard of care provided by the
6
7 organization if a friend or relative needed treatment). Overall engagement in future NHS
8
9 surveys could be reliability assessed by using a two subdimension model (advocacy
10
11 and motivation) rather than current three dimension model.
12
13

14 *Implications*

15
16 Theoretically, senior managers are best placed to modify the working environment,
17
18 provide resources, moderate job demands and create the conditions that foster
19
20 employee engagement. However, the pressure to control costs and prioritize
21
22 effectiveness may limit the impact of lessons learned from engagement research. Many
23
24 people currently working in or being cared for in NHS acute Trusts in England are aware
25
26 of the changing environment and recognize the pressures caused by externally driven
27
28 reforms, high work-intensity and rising job demands experienced by many healthcare
29
30 professionals. Alarming, these are the very conditions which have been associated
31
32 with higher levels of employee burnout.[12]
33
34
35

36
37 Healthcare organizations interested in improving engagement and quality ratings should
38
39 pay close attention to the proportion of employees who would recommend their
40
41 organization as a place to work or receive treatment, because this is a proxy for the
42
43 level of employee engagement and it predicts CQC ratings
44
45

46 *Study limitations*

47
48 The study uses a cross-sectional design which limits any conclusions about causation.
49
50 Although the study period is 2012–2016, the data extraction was determined by the
51
52 timing of CQC inspections, so a longitudinal design would better identify the factors
53
54
55
56
57
58
59
60

1
2
3 which consistently influence employee engagement and organizational performance.

4
5 The study sample is limited to NHS acute Trusts in England, which limits the
6
7 generalizability of the conclusions. The predictor variables are taken from a single self-
8
9 reported source, therefore using different sources, more instruments or adding objective
10
11 measurements would reduce common method variance.[7] Self-reported observations
12
13 can exaggerate relationships amongst variables and cannot exclude effects due to
14
15 latent variables. This research uses aggregated engagement scores whereas most
16
17 previous studies have used non-aggregated scores. Shuck and Wollard[24] claimed that
18
19 looking at engagement at the level of an organization rather than the individual may be
20
21 necessary but it “distorts the nature of the concept”.

22 23 24 25 26 *Directions of future research*

27
28 Improving healthcare quality is a high priority in developed economies and so research
29
30 designed to identify factors that predict quality performance should be encouraged.
31
32 Engagement as a predictor of employee or organization performance is supported by
33
34 several empirical studies.[13,22] Research that overcomes the methodological issues
35
36 identified in our study may provide stronger empirical evidence of the economic and
37
38 healthcare benefits of an engaged workforce. Research has tended to focus on
39
40 individual engagement but there is a clear need for more group-level studies particularly
41
42 in service industries where many people work in teams.[16] To facilitate this research,
43
44 the instruments currently used to measure individual engagement need to be tested at
45
46 different levels of organizations.

47
48
49 Whilst acknowledging the recommendation that a common definition of engagement be
50
51 used in future research it would nevertheless be interesting to test if the strong influence
52
53
54
55
56
57
58
59
60

1
2
3 of employee endorsement seen in our study, is more generalizable.[7]
4

5 Finally, future studies designed to identify the interventions that increase and maintain
6 staff engagement will be of value to academia, business schools and HRM
7
8 professionals alike.
9
10
11
12
13
14
15
16

17 **Acknowledgements**

18
19 We thank the Picker Institute for supplying individual Trust reports and for their prompt
20 response to data requests and other information. We are grateful to Rabia Imtiaz for her
21 help with this study. We acknowledge the help of Stephen Wood, University of Leicester
22 who commented on drafts of this paper. We also acknowledge Warren Smith, University
23 of Leicester who advised on an early draft. Finally, we appreciate the excellent
24 copyediting by Patricia Hewson.
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Footnotes

Contributions: MW conceived the research and carried out the statistical analysis. MW and WG contributed to the manuscript and approved the final version. Rabia Imtiaz provided some organizational details used in this research and independently verified the CQC ratings issued to acute Trusts in 2013-2016.

Competing interests: None. The initial research formed part of Dr Wake's MBA dissertation submitted to the University of Leicester.

Funding: This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Disclaimer: With the exception of direct quotes, the views and opinions expressed therein are those of the authors.

Patient consent: Not required as patients were not involved in the study.

Ethics approval: Ethical approval was obtained from the Ethics Sub-Committee for Media and Communication and School of Management, University of Leicester.

Provenance and peer review: Not commissioned; externally peer reviewed.

Data sharing statement: Survey data are available from <http://www.nhsstaffsurveys.com> and <https://www.cqc.org.uk>

References

1. NHS England. NHS staff survey. www.nhsstaffsurveys.com/Page/1056/Home/NHS-Staff-Survey-2016 (accessed 24 Jul 2018).
2. Papanikolaou PN, Christidi GD, Ioannidis JP. Patient outcomes with teaching versus nonteaching healthcare: a systematic review. *PLoS Med*. 2006;3(9):e341.
3. Sjetne IS, Veenstra M, Stavem K. The effect of hospital size and teaching status on patient experiences with hospital care: a multilevel analysis. *Medical Care* 2007; 45(3):252–8.
4. Brand CA, Barker AL, Morello RT, et al. A review of hospital characteristics associated with improved performance. *Int J Qual Health Care* 2012;24(5):483–94.
5. Demerouti E, Bakker AB, Nachreiner F, et al. The job demands–resources model of burnout. *J Appl Psychol*. 2001;86:499–512.
6. Maumo S, Kinnunen U, Ruokolainen M. Job demands and resources as antecedents of work engagement: a longitudinal study. *J Vocat Behav*. 2007;70(1):149–71.
7. Simpson MR. Engagement at work: a review of the literature. *Int J Nurs Stud*. 2009;46(7):1012–24.
8. Prins JT, Hoekstra-Weebers JE, Gazendam-Donofrio SM, et al. Burnout and engagement among resident doctors in the Netherlands: a national study. *Medical Education* 2010;44(3):236–47.
9. West M, Dawson J, Admasachew L, et al. NHS staff management and health service quality. Department of Health, 2011.
10. West M, Dawson J. Employee engagement and NHS performance. *The King's Fund* 2012:1–23.
11. Gruman JA, Saks AM. Performance management and employee engagement. *Hum Resour Manage R* 2011;21(2):123–36.
12. Laschinger HK, Leiter MP. The impact of nursing work environments on patient safety outcomes: the mediating role of burnout engagement. *J Nurs Adm*. 2006;36(5):259–67.
13. Schaufeli WB, Bakker AB. Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J Organ Behav*. 2004;25(3):293–315.

- 1
2
3 14. Xanthopoulou D, Bakker AB, Demerouti E, et al. Reciprocal relationships between
4 job resources, personal resources, and work engagement. *J Vocat Behav*.
5 2009;74(3):235–44.
6
- 7
8 15. CQC. State of Care 2016. [www.cqc.org.uk/content/cqc-reveals-comprehensive-](http://www.cqc.org.uk/content/cqc-reveals-comprehensive-picture-quality-hospital-care-england)
9 [picture-quality-hospital-care-england](http://www.cqc.org.uk/content/cqc-reveals-comprehensive-picture-quality-hospital-care-england) (accessed 24 Jul 2018).
10
- 11 16. Salanova M, Lorente L, Chambel et al. Linking transformational leadership to
12 nurses' extra-role performance: the mediating role of self-efficacy and work
13 engagement. *J Adv Nurs*. 2011;67(10):2256–66.
14
- 15 17. Picker Institute. Making sense of your staff survey. [www.nhsstaffsurveys.com/](http://www.nhsstaffsurveys.com/Page/1019/Past-Results/Staff-Survey-2016-Detailed-Spreadsheets/)
16 [Page/1019/Past-Results/Staff-Survey-2016-Detailed-Spreadsheets/](http://www.nhsstaffsurveys.com/Page/1019/Past-Results/Staff-Survey-2016-Detailed-Spreadsheets/) (accessed 24 Jul
17 2018).
18
- 19 18. Fiabane E, Giorgi I, Sguazzin C, et al. Work engagement and occupational stress in
20 nurses and other healthcare workers: the role of organisational and personal factors. *J*
21 *Clin Nurs*. 2013;22:2614–24.
22
- 23 19. Bakker AB, Albrecht SL, Leiter MP. Key questions regarding work engagement. *Eur*
24 *J Work Organ Psy*. 2011;20(1):4–28.
25
- 26 20. Nahrgang JD, Morgeson FP, Hofmann DA. Safety at work: a meta-analytic
27 investigation of the link between job demands, job resources, burnout, engagement,
28 and safety outcomes. *J Appl Psychol*. 2011;71:1–24.
29
- 30 21. Hakanen JJ, Perhoniemi R, Toppinen-Tanner S. Positive gain spirals at work: from
31 job resources to work engagement, personal initiative and work-unit innovativeness. *J*
32 *Vocat Behav*. 2008;73(1):78–91.
33
- 34 22. Harter JK, Schmidt FL, Hayes TL. Business-unit-level relationship between
35 employee satisfaction, employee engagement, and business outcomes: a meta-
36 analysis. *J Appl Psychol*. 2002;87(2):268–79.
37
- 38 23. Lowe G. How employee engagement matters for hospital performance. *Healthcare*
39 *Q* 2012;15(2):29–39.
40
- 41 24. Shuck B, Wollard K. Employee engagement and HRD: a seminal review of the
42 foundations. *Human Resour Dev Rev*. 2010;9(1):89–110.
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Legends to figures and tables

Figure 1

Conceptual model – In annual employee surveys, NHS engagement scores are synthesized from three subdimension scores. The dimensions of engagement may have differential associations with CQC ratings (which are a controversial indicator of the perceived quality of NHS providers in England).

Table 1

The NHS staff survey calculates overall engagement from three scales: motivation, advocacy and involvement.

Table 2

Hierarchical multiple regression – the conceptual model predicts CQC ratings. Engagement scores and Trust financial deficits are the significant predictors.

Table 3

Discriminate analysis – the intercorrelations and correlations between engagement subdimensions and CQC ratings can be represented by a non-correlated discriminate function (Function 1).

Table 4

Principal component analysis – advocacy scores from the year of and year before CQC inspections effectively predict employee engagement. Combined advocacy and motivation scores are a reliable indicator of overall engagement which can be efficiently represented by a two dimension model.

Legends to supplementary tables

Supplementary Table 1

Schematic of CQC ratings matrix – Provider ratings are reported in five domains which are defined in the table

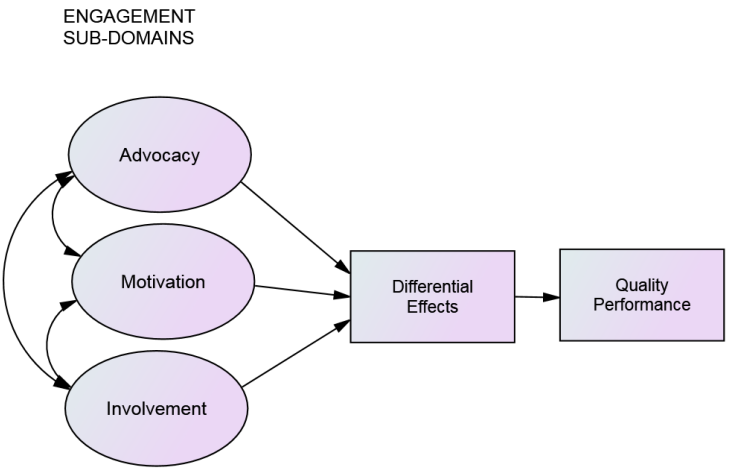
Supplementary Table 2

Descriptive statistics of study variables

Supplementary Table 3

Descriptive statistics for discriminate analysis – CQC rating categories and engagement subdomains are shown

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41



Rating	Domain	Definition
Outstanding	Safe	protecting people from abuse and avoidable harm and is rated across 3 areas; culture, staffing and environment
	Effective	treatment and support achieves good outcomes, promotes a good quality of life and is based on the best available evidence
Good	Caring	staff involve and treat people with compassion, kindness, dignity and respect
Needs improvement	Responsive	services are organized so that they meet people's needs
Inadequate	Well-led	leadership, management and governance of the organization assures the delivery of high-quality person-centered care, supports learning and innovation, and promotes an open and fair culture

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41

	Mean	Std Deviation	n
CQC Rating	1.28	.657	97
Beds	837.5	361.149	97
Teaching	.30	.462	96
FT	.64	.484	96
Deficit %	4.235	4.28497	96
Engagement Score	3.798	.09571	97

CQC	Sub- domain	Mean	Std. Deviation	n
inadeq	Advocacy	3.5709	.14822	8
	Motivation	3.8915	.06785	8
	Involvement	.6636	.02418	8
reqim	Advocacy	3.6987	.14999	57
	Motivation	3.9188	.07190	57
	Involvement	.6933	.03892	57
good	Advocacy	3.8892	.10011	29
	Motivation	3.9504	.06329	29
	Involvement	.7124	.02287	29
outstnd	Advocacy	4.0748	.10995	3
	Motivation	3.9675	.02208	3
	Involvement	.7177	.02065	3
Total	Advocacy	3.7567	.17674	97
	Motivation	3.9275	.06994	97
	Involvement	.6973	.03568	97

BMJ Open

**Effect of employee engagement on service quality ratings:
analysis of the National Health Service staff survey across
97 acute NHS Trusts in England and concurrent Care Quality
Commission outcomes (2012–2016)**

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2018-026472.R1
Article Type:	Research
Date Submitted by the Author:	28-Feb-2019
Complete List of Authors:	Wake, Mark; University Hospitals of Leicester NHS Trust, ENT Green, William; University of Leicester School of Management
Primary Subject Heading:	Health services research
Secondary Subject Heading:	Medical management, Nursing
Keywords:	CQC, Engagement, secondary care, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

SCHOLARONE™
Manuscripts

TITLE

Effect of employee engagement on service quality ratings: analysis of the National Health Service staff survey across 97 acute NHS Trusts in England and concurrent Care Quality Commission outcomes (2012–2016)

Authors

Mark Wake[1], William Green[2]

Author Affiliations

[1] University Hospitals of Leicester, Infirmary Square, Leicester LE1 5WW, UK: (drmarkwake@aol.com)

[2] University of Leicester: Associate Professor; Director of Research Impact and Knowledge Exchange, College of Social Sciences, Arts and Humanities. School of Business, University of Leicester, Leicester LE1 7RH, UK: (wg32@leicester.ac.uk)

Correspondence

Dr Mark Wake, ENT Department, Level 3 Balmoral Building, Leicester Royal Infirmary, Infirmary Square, Leicester, LE1 5WW. Tel: 0044 116 254 1414: (drmarkwake@aol.com).

Abstract

Objective This research looks at measures of employee engagement in NHS acute Trusts in England and tests the association between organization-level engagement and the CQC's quality ratings.

Design Cross-sectional.

Setting 97 acute NHS Trusts in England.

Participants 97 NHS acute Trusts in England (2012–2016). Data includes provider details, staff survey results and CQC reports. Hybrid Trusts or organizations affected by recent mergers are excluded.

Outcome Measures Analysis uses organization-level employee engagement and CQC quality ratings.

Results Employee engagement is affected by organizational factors, including patient bed numbers ($\beta=-0.46$, $p<0.05$) and financial revenue ($\beta=0.38$, $p<0.05$). CQC ratings are predicted by overall employee engagement score ($\beta=0.57$, $p<0.001$) and financial deficit ($\beta=-0.19$, $p<0.05$). The most influential employee engagement dimension on provider ratings is 'advocacy' ($\lambda=0.54$, $p<0.001$). Analysis support the notion that employee engagement can be predicted from advocacy scores alone (eigenvalue=4.03). Better still, combining advocacy scores from the previous year's survey or adding in motivation scores is a highly reliable indication of overall employee engagement (95.4% of total variance).

Conclusions NHS acute Trusts with high employee engagement scores tend to have better CQC ratings. Trusts with a high financial deficit tend to have lower ratings. Employee engagement subdimensions have different associations with CQC ratings, the most influential dimension being advocacy score. A two subdimension

1
2
3 model of engagement efficiently predicts overall employee engagement in NHS
4
5 acute Trusts in England. Healthcare leaders should pay close attention to the
6
7 proportion of employees who would recommend their organization as a place to work
8
9 or receive treatment, because this is a proxy for the level of engagement, and it
10
11 predicts CQC ratings.
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For peer review only

Article Summary

Strengths and limitations of this study

- Engagement data is taken from a large national survey of NHS employees.
- The survey results coincide with the first national inspection programme of all acute NHS Trusts in England, by the Care Quality Commission (CQC).
- A conceptual model is used to test the associations between the subdimensions of employee engagement and perceived quality (as measured by the CQC).
- The predictor variables are taken from a single self-reported source which risks common method variance.
- The sample and cross-sectional design limit conclusions about causation or generalizability.

Introduction

This study considers organization-level measures of work engagement taken from the annual National Health Service (NHS) staff surveys (NSS) 2012–2016.[1] It examines the effect that organizational size, status and financial revenue have on overall engagement and compares engagement scores to provider ratings for NHS acute Trusts in England. Employee engagement research typically uses a multidimensional construct of engagement, so the study applies this approach to the NHS. It investigates the associations between NSS engagement subdimensions and the perceived quality of provider organizations (as reported by the Care Quality Commission).

Organizational factors

Saks[2] suggested that employees repay their organization for the resources they receive through their levels of engagement and to some extent engagement reflects the relationship employees have with their organizations. Maslach et al.[3] emphasized the important role that organizations play in providing these valued resources by allowing employees some autonomy or by providing feedback and learning opportunities. The engagement-promoting capacity of job resources was also identified by Bakker et al.[4] who described job resources as the physical, social or organizational factors which reduce job demands and play a motivational role at work. Job resources reduced the perceived demands of a job and appeared to protect employees from burnout, particularly during sustained periods of high work intensity. From a healthcare perspective, Hakanen et al.[5] in a longitudinal study of over 2500 Finnish dentists reported a positive, step-wise relationship between job resources, engagement and personal initiative or innovativeness. In another Finnish study

1
2
3 of 409 healthcare workers, Maumo et al.[6] concluded that the best predictors of
4 engagement were self-esteem and the ability of employees to control some
5 aspects of their work (job resources were more influential than job demands).
6
7

8 Relatedly, job resources have been linked to engagement amongst nurses and
9
10 doctors working in hospital environments.[7-8]
11
12

13
14
15 Several studies have linked the structure of healthcare organizations to
16
17 measures of performance including efficiency, patient outcomes, staff and
18
19 patient satisfaction.[9-10] There has been a reporting bias towards “bigger is
20
21 better” but the evidence for such a general assertion is weak.[11] In the UK,
22
23 recruitment and retention of staff has historically been more successful in large,
24
25 prestigious teaching hospitals with considerable resources at their disposal.
26
27 West et al[12] found that the type of NHS organization influenced employee
28
29 engagement but the key organizational characteristics which predict employee
30
31 engagement in an acute healthcare environment are uncertain. Consequently,
32
33 this research examines the results of recent NHS staff surveys for evidence that
34
35 employee engagement is linked to organizational characteristics using the
36
37 following hypothesis (H1):
38
39
40
41

42
43 *H1: NHS employee engagement will be related to Trust size, type*
44
45 *(Foundation/non-Foundation), status (teaching/non-teaching hospital) and*
46
47 *financial position. Higher levels of employee engagement may be associated*
48
49 *with big teaching hospitals or Foundation Trusts.*
50
51

52
53 *Employee engagement and performance (CQC ratings)*
54

55
56 The proposition that employee engagement has a positive effect on organizational
57
58 performance is not new.[13] Employee engagement has been associated with
59
60

1
2
3 improved performance in many industries, albeit there is limited healthcare
4 evidence. Engaged employees tend to be intrinsically motivated, are more likely to
5 achieve their goals and learn from mistakes and engagement has been
6 associated with organization-level quality outcomes.[14-16] Engagement amongst
7 healthcare professionals is considered high compared to other industries and
8 hospitals with more engaged nurses tended to deliver better patient care and have
9 superior safety records compared to those with less engaged employees.[14]
10 Although there are few studies from the NHS, the historical link between NHS
11 engagement and quality was reported in West et al (2011). Staff engagement had
12 a significant effect on patient satisfaction, hospital mortality rates, infection rates,
13 absenteeism, staff turnover and Annual Health Check ratings (a forerunner of
14 QCC ratings).

15
16 One controversial measure of NHS provider quality is the use of CQC healthcare
17 ratings by the Department of Health and Social Care. In 2016, the CQC completed
18 the first national inspection programme of NHS acute Trusts in England and rated
19 each organization as: outstanding, good, requires improvement or inadequate.
20 The CQC highlighted the variation in quality and attributed this to factors such as
21 culture, leadership and staff engagement.[17] It follows, that employee
22 engagement is worth investigating as a predictor of CQC ratings. Based on the
23 literature, the direct relationship between engagement and perceived quality of
24 NHS acute Trusts is expressed as our second hypothesis (H2):

25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
*H 2: There is a positive relationship between the levels of staff engagement and
Trust performance so overall employee engagement in acute NHS Trusts may
predict their CQC ratings.*

Engagement subdimensions

1
2
3 Although Kahn[18] was the first to define work engagement as a multi-dimensional
4 construct related to meaningfulness, safety and availability, subsequent
5
6 developmental theories conceptualized engagement as the positive antithesis to
7
8 burnout. Contemporary research has been strongly influenced by Schaufeli and
9
10 Bakker's[15] definition of engagement as a "positive, fulfilling, work-related state of
11
12 mind characterized by vigor, dedication and absorption". Vigour was associated with
13
14 energy, resilience, persistence and greater effort. Dedication was characterized by
15
16 involvement and associated with a personal sense of significance, pride, inspiration
17
18 and challenge. The third sub-dimension (absorption) was linked to being happily
19
20 engrossed at work so that time passed quickly.
21
22
23
24
25

26
27 The NSS questionnaire was based on the Utrecht Work Engagement Scale. The
28
29 final survey questions were influenced by the NSS Improvement Board to reflect
30
31 employee engagement in the context of the organization and its environment.
32

33
34 These modifications were tested by cognitive interviewing for validity.[19] Overall-
35
36 engagement scores were synthesized from three subdimension scales: motivation,
37
38 advocacy and involvement. NSS motivation is similar to psychological engagement
39
40 and includes elements of intrinsic motivation, dedication and absorption at work.
41

42
43 Advocacy is strongly linked to care standards and reflects the perceptions that staff
44
45 have of the organization's patient-centeredness and the level of pride they feel at
46
47 work. It also reflects the willingness to recommend the organization as an employer
48
49 or healthcare provider. Involvement is a "practitioner" measure which covers
50
51 employee involvement in decision-making, change management and relationships
52
53 with supervisors.[20]
54

55
56
57 Recent studies have suggested that employee engagement is better represented by
58
59 a two-subdimension model. For example, Salanova et al.[21] reported that only two
60

1
2
3 of Schaufeli and Bakker's[15] dimensions predicted employee engagement, namely
4
5 vigour and dedication. The 'absorption' subdimension was considered a
6
7 consequence of employee engagement, not an antecedent. The debate about the
8
9 antecedents of employee engagement prompted the research question:

10
11
12
13 *In NHS survey instruments, overall engagement is calculated from three*
14
15 *subdimension scales. Which subdimensions are the 'core dimensions' for NHS*
16
17 *employee engagement?* (Figure 1)
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Methods

For consistency, this research focuses on NHS acute Trusts, whilst organizations in unusual circumstances (recent mergers, acquisitions or significant reconfigurations) and hybrid organizations (mixed community and acute services) are excluded. The resulting sample is 97 NHS acute Trusts in England. This study does not include NHS services in the rest of the UK, as they fall under different regulatory arrangements. Although this study uses Trust-level data, representativeness and comparability are assumed because a weighting procedure is applied to NSS returns based on a hypothetical national staff profile for each type of organization. To allow for historical comparisons, data weighting is regularly reviewed.[22]

Organization characteristics

All data is publicly available in the UK on NHS acute Trust websites, including NHS Trust Board papers and quality accounts. Organizational characteristics are selected as follows (to identify or reduce confounding effects). Acute Trusts in England have a wide range of operating incomes that directly affects available resources. Trusts with significant financial deficits can have constraints on resources so the size of Trust deficit as a percentage of financial turnover is used. Although bed numbers are an indicator of organizational size, it may also reflect an element of work intensity, and so could affect performance. Teaching hospitals affiliated to reputable academic organizations are associated with higher performance, so teaching status is included.[9-10] 'Foundation Trust' status is awarded to higher-performing NHS organizations and is intended to give them more autonomy and greater financial flexibility; and therefore is likely to impact on culture, climate and resources.

Engagement and performance (CQC ratings)

1
2
3 NHS acute Trust data is extracted from NSS reports. For each Trust, survey data
4 corresponding to the year of their CQC inspection and the previous year is used.
5
6 The mean average annual response rate for acute Trusts for 2012–2016 is: 49%
7
8 (2012–13), 42% (2013–14), 41% (2014–15) and 43% (2015–16) respectively,
9
10 comprising between 269,000 and 456,000 respondents per survey year.
11
12

13
14
15 Trust-level engagement scores are summarized for each organization using the
16
17 weighting procedure described above. Organization scores are then compared to
18
19 the national average for organizations of a similar type. Benchmark data is obtained
20
21 from the summary reports provided to individual NHS Trusts.[22]
22
23

24
25 The CQC inspected all 136 acute Trusts and 17 specialist Trusts in England
26
27 between September 2012–June 2016 and published the results on their website.
28
29 This included a total of 265 non-specialist hospital sites or locations and 27 specialist
30
31 hospitals operated by these Trusts. Assessment of core health services included:
32
33 children and young people, intensive/critical care, maternity and gynaecology, end of
34
35 life care, outpatients and diagnostic imaging, surgery, urgent and emergency
36
37 services and medical care including older people. In making their assessments, the
38
39 CQC uses a set of 150 indicators obtained from various sources (including
40
41 inspection visits). They rate organizations under five domains (safe, effective, caring,
42
43 responsive and well-led). Each organization receives an overall rating as:
44
45 outstanding, good, needs improvement or inadequate.[17] (Supplementary Table 1)
46
47
48
49

50 *NSS dimensions of employee engagement*

51
52
53 As discussed, a three subdimension model of employee engagement is captured in
54
55 the NSS. Each dimension is scored across a number of items, using a five-point
56
57 scale or yes/no answers. 'Overall engagement' scores for each respondent is
58
59
60

created by taking the mean average from the three subdimension scores (motivation, advocacy and involvement). The subdimension scores have strong intercorrelations (Pearson's, $p < 0.001$) and convergent validity. Factor loadings are all > 0.7 , Bartlett's test $p < 0.001$, Kaiser Myer Olkin = 0.71. The overall engagement Cronbach's alpha = 0.70 and the standardized regression weight < 0.2 for subdimension scales (using a single common factor approach). (Table 1)

Table 1: The NHS staff survey calculates overall engagement from three scales: motivation, advocacy and involvement.

Dimension	Description
Motivation	Staff motivation at work (Cronbach's alpha=0.81)
Advocacy	Recommend the organization as a place to work or receive treatment (Cronbach's alpha=0.74).
Involvement	Ability to contribute towards improvement at work (Cronbach's alpha=0.86).

Patient and Public Involvement

Patients and public were not involved in this study.

Ethics approval

Ethical approval was obtained from the Ethics Sub-Committee for Media and Communication and School of Management, University of Leicester.

Results

Employee engagement is treated as an organization-level variable. Scatter plots of standardized residuals show a roughly rectangular distribution with central clustering, so the assumption of linearity is met. There is no evidence of a systematic pattern of residuals and there are no residuals outside the accepted range for Trust-level data. Only two organizations have Mahalanobis distances greater than the critical value (e.g. $\chi^2=18.47$ for 4 degrees of freedom) which is around the 2% recommended tolerance. Similarly, Cook's distances are <1 , so the outliers do not have an undue influence on the predictability of the model. As a result, no acute Trusts with complete data sets are excluded.

Organizational factors and employee engagement

Employee engagement is compared to Trust size (financial turnover, bed numbers), type (Foundation/non-Foundation) and teaching status (teaching/non-teaching hospital). Univariate analysis of variance (Anova) shows that the model is statistically significant compared to chance ($p<0.05$). Regression analysis is used to quantify the % variance in employee engagement explained by the predictor variables ($R^2=0.104$, adjusted $R^2=0.064$, standard error=0.09). This suggests that the combined predictors explain 6-10% of the variance. The significant contributions are bed numbers ($\beta=-0.46$, $p<0.05$) and financial turnover ($\beta=0.38$, $p<0.05$).

Employee engagement and performance (CQC ratings)

The data is analyzed using hierarchical multiple regression: block 1 comprises control variables (financial deficit as % turnover, bed numbers, and Trust status) and block 2 Trust engagement scores (Supplementary Table 2).

In this way, the model assesses the contributions of predictor variables to the

variance in the dependent variable. The model is a statistically significant predictor of CQC ratings (Anova; $F=11.42$, $p<0.001$). The combined effect of the model's variables is 39% of CQC ratings variance. The control variables account for approximately 10% of CQC ratings. The change in R^2 (ΔR^2) in block 2 shows that engagement scores account for an additional 29% of variance ($p<0.001$, standard error=0.53). The statistically significant predictors are financial deficit ($\beta=-0.19$, $p<0.05$) and engagement score ($\beta=0.57$, $p<0.001$). The regression coefficients are shown in Table 2.

Table 2: Hierarchical multiple regression – the conceptual model predicts CQC ratings. Engagement scores and Trust financial deficits are the significant predictors.

	Unstandardized coefficients		Standardized coefficients	Change statistics			
	R	R ²	Adjusted R ²	Std.error	ΔR^2	ΔF	p value
Controls ^{a,b}	0.312	0.097	0.057	0.638	0.097	2.423	.054
Full model ^{a,c}	0.625	0.391	0.357	0.527	0.294	42.891	<0.001***

a. Dependent variable: CQC rating; * $p<0.05$, ** $p<0.005$, *** $p<0.001$

b. Predictors: (Constant), Deficit %, FT or non FT, Teaching status, Bed numbers

c. Predictors: (Constant), Deficit %, FT or non FT, Teaching status, Bed numbers, Engagement score

Employee engagement dimensions and perceived performance

Discriminate analysis is used to assess the ability of the employee engagement dimension scores to predict CQC ratings (Supplementary Table 3). The assumption of multivariate normality is met with Box's M, $p>0.05$. Univariate Anova suggests a statistically significant difference between the three engagement dimensions.

Canonical discriminate functions show a statistically significant relationship between

the discriminating function (1) and the engagement subdimension scores. The (eigenvalues) canonical correlation=0.67, demonstrating good group separation by a discriminate function. That function explains 95.7% of the variance between the engagement dimensions ($\lambda=0.54$, $p<0.001$). Analysis shows that the factor driving discriminate function 1 is advocacy score, with the largest absolute correlation=0.96 (Table 3).

Table 3: Discriminate analysis – the intercorrelations and correlations between engagement subdimensions and CQC ratings can be represented by a non-correlated discriminate function (Function 1).

Function	Eigenvalue	% of variance	Cumulative %	Canonical correlation
1	0.801	95.7	95.7	0.667
2	0.036	4.3	100.0	0.185
3	0.000	0.0	100.0	0.020

Core dimensions of employee engagement in the NHS

Principal component analysis is used to test for a latent effect using data from the year of and the year before (Yb4) CQC inspections. Standard assumptions are met (sample >10 subjects per variable, strong intercorrelations $r>0.3$, Bartlett's test $p<0.001$, Kaiser Myer Olkin=0.76). The component matrix supports retaining a 1-factor solution since only 1 component had eigenvalue>1. The retained factor is advocacy score (eigenvalue=4.03), which explains approximately 67% of the total variance in the engagement data. By adding advocacy scores from the year before CQC inspections this increases to 80%. Combined advocacy and motivation scores from both years explain 95% of the total variance (Table 4).

Table 4: Principal component analysis – advocacy scores from the year of and year before CQC inspections effectively predict employee engagement. Combined advocacy and motivation scores are a reliable indicator of overall engagement which can be efficiently represented by a two dimension model.

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1. Advocacy	4.033	67.223	67.223	4.033	67.223	67.223
2. AdvocacyYb4 ^a	0.748	12.462	79.684	-	-	-
3. Motivation	0.545	9.088	88.772	-	-	-
4. MotivationYb4 ^a	0.398	6.629	95.401	-	-	-
5. Involvement	0.182	3.042	98.442	-	-	-
6. InvolvementYb4 ^a	0.093	1.558	100.000	-	-	-

^aYb4 = year before CQC inspection

Discussion

Engagement is a popular but imprecise term with various definitions, models and measurement tools used in academic research. Conceptual models tend to consider engagement in terms of job demands, job resources and personal resources,[4-5,23]. In this context; the demands of a job or available resources extend beyond management styles, work intensity, materials or equipment to include employee autonomy, social support, optimism, coaching, feedback, personal development, self-efficacy and self-esteem. Adequate resources are an important motivational force at work because they reduce the perceived demands of a job, particularly when work intensity is consistently high.[5] Maumo et al.[6] reported that the loss of these resources can produce a downward spiral, particularly when employees sense a loss of autonomy or the inability to control aspects of their work.

Simpson's review emphasized how organizational factors affected the engagement of nurses (in addition to job attributes and leader behaviours).[7] Our findings emphasize that nuancing is required over the assumption that organizational structure has a strong effect on engagement. Our analysis shows that Trust size, type and status explain 6-10% of the variance in engagement scores which only partially supports our first hypothesis. Although the size of NHS acute Trusts is related to engagement scores, the two indicators of organizational size have opposite associations. Trusts with higher incomes (turnover) tended to have more engaged employees but organizations with more beds are associated with lower engagement. Parsimoniously, we speculate that the most influential organizational factors on engagement are related less to structure and more to employees' perceptions of the culture, leadership style and their working environment.[24]

1
2
3 There is growing interest in workplace factors that influence employee engagement
4 due to the apparent effect that engagement has on organization-level performance
5 and personal well-being. Reported benefits to businesses included: improved
6 productivity, profitability and customer satisfaction.[4,16,25-26] Engagement
7 research in healthcare settings tends to focus on health outcomes or quality metrics
8 rather than business performance.
9

10
11
12 Whist comparisons between countries and industrial sectors is problematic,
13 worldwide, the NHS is ranked fifth for number of employees and the NSS is
14 considered to be the largest annual employee survey of its kind. West and Dawson
15 (2012) reported that levels of employee engagement predicted hospital quality
16 ratings (in addition to mortality, infection rates, patient satisfaction and absenteeism).
17 These studies were based on survey data from 2008-2009 but despite a change in
18 the regulatory regime and some outcome measures, our study suggests that the link
19 between employee engagement and quality ratings in UK secondary healthcare has
20 been maintained [20]. This finding supports our second hypothesis. The CQC
21 highlights that financial pressures in provider organizations are associated with lower
22 quality ratings, which is supported by the finding in our study: NHS acute Trusts with
23 higher financial deficits as a proportion of their turnover tend to achieve lower CQC
24 ratings. Although the CQC reported that good internal financial management is
25 linked with better hospital ratings, this should be taken in the context of the prevailing
26 external environment (particularly the pressure to control costs and prioritize
27 effectiveness). CQC ratings do not decipher between organizations that are “better
28 at balancing their budgets” and the root causes of the financial “deficits” in
29 challenged Trusts.[17] There are widespread calls for investment in the NHS but it
30 remains to be seen what level of investment is required before a ‘quality dividend’ is
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 apparent in secondary care providers in the UK.
4

5
6 Engagement is generally considered to be a multidimensional construct and,
7
8 adopting this approach, the NSS uses a three subdimension model to assess
9
10 overall engagement. Schaufeli et al.[15] described the subdimensions of
11
12 engagement as vigour, dedication and absorption. This model has been widely
13
14 adopted, indeed Simpson[7] recommended it be applied to all nurse-related
15
16 research in order to provide a consistent approach. Although the models are not
17
18 directly compatible, Schaufeli's vigour dimension links to NSS motivation and
19
20 dedication is related to the NSS involvement or advocacy dimensions. Our study
21
22 suggests that advocacy is the most influential dimension on CQC ratings. Better
23
24 ratings tended to occur in organizations where employees thought the care of
25
26 patients or service users was the organization's top priority and where they
27
28 recommend their organization as a place to work or receive treatment. This is
29
30 consistent with CQC[17] which reported that "staff in Trusts that have received
31
32 higher ratings tend to recommend their organisation as a place to work and/or
33
34 receive treatment. Furthermore, our analysis suggests that advocacy scores
35
36 explain most of the variance in overall engagement scores. This implies that NHS
37
38 employee engagement could be efficiently predicted by simply determining
39
40 advocacy scores in future surveys. Alternatively, overall engagement could be
41
42 reliability assessed by using a two subdimension model of engagement (advocacy
43
44 plus motivation). This is consistent with Salanova et al.[21] and Maumo et al.[6]
45
46 who reverted to a two-dimension model of engagement, concluding that vigour and
47
48 dedication were the core dimensions of engagement in healthcare workers.
49
50 Engaged employees choose to employ their energy whilst at work, they tend to be
51
52 aware of their business context, identify with their role, are attentive and absorbed
53
54
55
56
57
58
59
60

1
2
3 when performing their job. The NSS advocacy scale contains a strong element of
4 employee endorsement and has 2/3 questions that are specific to healthcare. In
5
6 this context, it is consistent with self- assessment by employees of their
7
8 psychological state at work. This study does not seek to replace existing theory but
9
10 rather explores the functional relationships acting on and from engagement in a
11
12 healthcare setting. In broad terms, engagement as a construct may reduce to its
13
14 dimensions but these dimensions cannot reduce to overall engagement. By the
15
16 same token, the dimensions of engagement do not entirely explain engagement but
17
18 may be used to measure it. This type of non-representativeness is permissible
19
20 because it is apparent, pragmatic and accommodative to the context.
21
22
23
24
25

26 *Conclusion*

27
28 This study provides evidence that the NSS measure of 'overall' employee
29
30 engagement predicts regulator's ratings of NHS acute Trusts in England.
31
32 Organizations with higher engagement scores tend to have better CQC ratings. This
33
34 research also provides new evidence that the NSS engagement dimensions have
35
36 different associations with these ratings. Specifically, it shows that the most
37
38 influential predictor of CQC ratings is advocacy score (employees think the care of
39
40 patients and service users is the organization's top priority, they would recommend
41
42 their organization to others as a place to work and would be happy with the standard
43
44 of care provided by the organization if a friend or relative needed treatment). Overall
45
46 engagement in future NHS surveys could be reliability assessed by using a two
47
48 subdimension model (advocacy and motivation) rather than current three
49
50 subdimension model.
51
52
53
54
55

56 *Implications*

1
2
3 Theoretically, senior managers are best placed to modify the working environment,
4 provide resources, moderate job demands and create the conditions that foster
5 employee engagement. However, the pressure to control costs and prioritize
6 effectiveness may limit the impact of lessons learned from engagement research.
7
8
9

10
11
12 Many people currently working in or being cared for in NHS acute Trusts in England
13 are aware of the changing environment and recognize the pressures caused by
14 externally driven reforms, high work-intensity and rising job demands experienced by
15 many healthcare professionals. Alarming, these are the very conditions which have
16 been associated with higher levels of employee burnout.[14]
17
18
19
20
21
22

23
24 Healthcare organizations interested in improving engagement and quality ratings
25 should pay close attention to the proportion of employees who would recommend
26 their organization as a place to work or receive treatment, because this is a proxy for
27 the level of employee engagement, and it predicts CQC ratings
28
29
30
31
32

33 *Study limitations*

34
35
36 The study uses a cross-sectional design which limits any conclusions about
37 causation. Although the study period is 2012–2016, the data extraction was
38 determined by the timing of CQC inspections, so a longitudinal design would better
39 identify the factors which consistently influence employee engagement and
40 organizational performance. Although there is a risk of reverse causality (CQC
41 ratings predict engagement), the organization-level engagement scores were stable
42 during the study period and most Trusts were only inspected once by the CQC.
43
44
45
46
47
48
49
50
51

52
53 The sample is limited to NHS acute Trusts in England, which limits the
54 generalizability of the conclusions. The predictor variables are taken from a single
55 self-reported source, therefore using different sources, more instruments or adding
56
57
58
59
60

1
2
3 objective measurements would reduce common method variance.[7] However the
4
5 criterion variable was from a different source and time which mitigates this bias.[27]
6
7 Self-reported observations can exaggerate relationships amongst variables and
8
9 cannot exclude effects due to latent variables. This research uses aggregated
10
11 engagement scores whereas most previous studies have used non-aggregated
12
13 scores. Shuck and Wollard[28] claimed that looking at engagement at the level of an
14
15 organization rather than the individual may be necessary but it “distorts the nature of
16
17 the concept”.

21 22 *Directions of future research*

23
24 Improving healthcare quality is a high priority in developed economies and so
25
26 research designed to identify factors that predict quality performance should be
27
28 encouraged. Engagement as a predictor of employee or organization performance is
29
30 supported by several empirical studies.[15,25] Research that overcomes the
31
32 methodological issues identified in our study may provide stronger empirical
33
34 evidence of the economic and healthcare benefits of an engaged workforce.
35
36 Research has tended to focus on individual engagement but there is a clear need for
37
38 more group-level studies particularly in service industries where many people work in
39
40 teams.[21] To facilitate this research, the instruments currently used to measure
41
42 individual engagement need to be tested at different levels of an organization.
43
44
45
46
47

48 Whilst acknowledging the recommendation that a common definition of engagement
49
50 be used in future research it would nevertheless be interesting to test if the strong
51
52 influence of employee endorsement seen in our study, is more generalizable.[7]
53
54

55 Finally, future studies designed to identify the interventions that increase and
56
57 maintain staff engagement will be of value to academia, business schools and HRM
58
59
60

1
2
3 professionals alike.
4
5
6
7

8 **Acknowledgements**

9
10
11 We thank the Picker Institute for supplying individual Trust reports and for their
12
13 prompt response to data requests and other information. We are grateful to Rabia
14
15 Imtiaz for her help with this study. She provided some organizational details used in
16
17 this research and independently verified the CQC ratings issued to acute Trusts in
18
19 2013-2016. We acknowledge Warren Smith and Stephen Wood, both University of
20
21 Leicester, who commented on earlier drafts of this paper. Finally, we appreciate the
22
23 excellent copyediting by Patricia Hewson.
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Footnotes

Contributions: MW conceived the research and carried out the statistical analysis.

MW and WG contributed to the manuscript and approved the final version.

Competing interests: There are no competing interests for any author.

Funding: This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Disclaimer: With the exception of direct quotes, the views and opinions expressed therein are those of the authors.

Patient consent: Not required as patients were not involved in the study.

Provenance and peer review: Not commissioned; externally peer reviewed.

Data sharing statement: Survey data are available from <http://www.nhsstaffsurveys.com> and <https://www.cqc.org.uk>

References

1. NHS England. NHS staff survey. www.nhsstaffsurveys.com/Page/1056/Home/NHS-Staff-Survey-2016 (accessed 24 Jul 2018).
2. Saks AM. Antecedents and consequences of employee engagement, *J Manage Psychol* 2006;21:600-19.
3. Maslach C, Schaufeli WB, Leiter MP. Job burnout, *Annu Rev Psychol* 2001;52:397-422.
4. Bakker AB, Albrecht SL, Leiter MP. Key questions regarding work engagement. *Eur J Work Organ Psy*. 2011;20(1):4-28.
5. Hakanen JJ, Perhoniemi R, Toppinen-Tanner S. Positive gain spirals at work: from job resources to work engagement, personal initiative and work-unit innovativeness. *J Vocat Behav*. 2008;73(1):78-91.
6. Maumo S, Kinnunen U, Ruokolainen M. Job demands and resources as antecedents of work engagement: a longitudinal study. *J Vocat Behav*. 2007;70(1):149-71.
7. Simpson MR. Engagement at work: a review of the literature. *Int J Nurs Stud*. 2009;46(7):1012-24.
8. Prins JT, Hoekstra-Weebers JE, Gazendam-Donofrio SM, et al. Burnout and engagement among resident doctors in the Netherlands: a national study. *Medical Education* 2010;44(3):236-47.
9. Papanikolaou PN, Christidi GD, Ioannidis JP. Patient outcomes with teaching versus nonteaching healthcare: a systematic review. *PLoS Med*. 2006;3(9):e341.
10. Sjetne IS, Veenstra M, Stavem K. The effect of hospital size and teaching status on patient experiences with hospital care: a multilevel analysis. *Medical Care* 2007; 45(3):252-8.
11. Brand CA, Barker AL, Morello RT, et al. A review of hospital characteristics associated with improved performance. *Int J Qual Health Care* 2012;24(5):483-94.
12. West M, Dawson J, Admasachew L, et al. NHS staff management and health service quality. Department of Health, 2011.
13. Gruman JA, Saks AM. Performance management and employee engagement. *Hum Resour Manage R* 2011;21(2):123-36.
14. Laschinger HK, Leiter MP. The impact of nursing work environments on patient safety outcomes: the mediating role of burnout engagement. *J Nurs Adm*. 2006;36(5):259-675.

15. Schaufeli WB, Bakker AB. Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J Organ Behav*. 2004;25(3):293–315.
16. Xanthopoulou D, Bakker AB, Demerouti E, et al. Reciprocal relationships between job resources, personal resources, and work engagement. *J Vocat Behav*. 2009;74(3):235–44.
17. CQC. State of Care 2016. www.cqc.org.uk/content/cqc-reveals-comprehensive-picture-quality-hospital-care-england (accessed 24 Jul 2018).
18. Kahn WA. Psychological conditions of personal engagement and disengagement at work, *Academy of management journal* 1990;33:692-724.
19. Admasachew L, Dawson J. Staff engagement in the NHS—a multilevel analysis, *Aston University* 2010.
20. West M, Dawson J. Employee engagement and NHS performance. *The King's Fund* 2012:1–23.
21. Salanova M, Lorente L, Chambel et al. Linking transformational leadership to nurses' extra-role performance: the mediating role of self-efficacy and work engagement. *J Adv Nurs*. 2011;67(10):2256–66.
22. Picker Institute. Making sense of your staff survey. www.nhsstaffsurveys.com/Page/1019/Past-Results/Staff-Survey-2016-Detailed-Spreadsheets/ (accessed 24 Jul 2018).
23. Nahrgang JD, Morgeson FP, Hofmann DA. Safety at work: a meta-analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. *J Appl Psychol*. 2011;71:1–24.
24. Fiabane E, Giorgi I, Sguazzin C, et al. Work engagement and occupational stress in nurses and other healthcare workers: the role of organisational and personal factors. *J Clin Nurs*. 2013;22:2614–24.
25. Harter JK, Schmidt FL, Hayes TL. Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta-analysis. *J Appl Psychol*. 2002;87(2):268–79.
26. Lowe G. How employee engagement matters for hospital performance. *Healthcare Q* 2012;15(2):29–39.
27. Podsakoff PM, MacKenzie SB, Lee J, et al. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J Appl Psychol* 2003;88:879.
28. Shuck B, Wollard K. Employee engagement and HRD: a seminal review of the foundations. *Human Resour Dev Rev*. 2010;9(1):89–110.

Legends to figures and tables

Figure 1

Conceptual model – In annual employee surveys, NHS engagement scores are synthesized from three subdimension scores. The dimensions of engagement may have differential associations with CQC ratings (which are a controversial indicator of the perceived quality of NHS providers in England).

Table 1

The NHS staff survey calculates overall engagement from three scales: motivation, advocacy and involvement.

Table 2

Hierarchical multiple regression – the conceptual model predicts CQC ratings. Engagement scores and Trust financial deficits are the significant predictors.

Table 3

Discriminate analysis – the intercorrelations and correlations between engagement subdimensions and CQC ratings can be represented by a non-correlated discriminate function (Function 1).

Table 4

Principal component analysis – advocacy scores from the year of and year before CQC inspections effectively predict employee engagement. Combined advocacy and motivation scores are a reliable indicator of overall engagement which can be efficiently represented by a two-dimension model.

Legends to supplementary tables

Supplementary Table 1

Schematic of CQC ratings matrix – Provider ratings are reported in five domains which are defined in the table

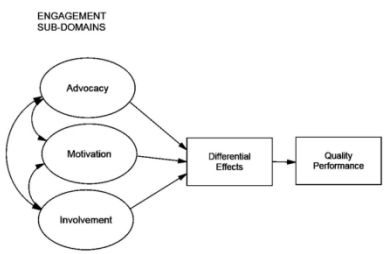
Supplementary Table 2

Descriptive statistics of study variables

Supplementary Table 3

Descriptive statistics for discriminate analysis – CQC rating categories and engagement subdomains are shown

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60



76x42mm (600 x 600 DPI)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Rating	Domain	Definition
Outstanding	Safe	protecting people from abuse and avoidable harm and is rated across 3 areas; culture, staffing and environment
	Effective	treatment and support achieves good outcomes, promotes a good quality of life and is based on the best available evidence
Good	Caring	staff involve and treat people with compassion, kindness, dignity and respect
Needs improvement	Responsive	services are organized so that they meet people's needs
Inadequate	Well-led	leadership, management and governance of the organization assures the delivery of high-quality person-centered care, supports learning and innovation, and promotes an open and fair culture

76x42mm (600 x 600 DPI)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

	Std		n
	Mean	Deviation	
CQC Rating	1.28	.657	97
Beds	837.5	361.149	97
Teaching	.30	.462	96
FT	.64	.484	96
Deficit %	4.235	4.28497	96
Engagement Score	3.798	.09571	97

76x42mm (600 x 600 DPI)

CQC	Sub-domain	Mean	Std. Deviation	n
inadeq	Advocacy	3.5709	.14822	8
	Motivation	3.8915	.06785	8
	Involvement	.6636	.02418	8
reqim	Advocacy	3.6987	.14999	57
	Motivation	3.9188	.07190	57
	Involvement	.6933	.03892	57
good	Advocacy	3.8892	.10011	29
	Motivation	3.9504	.06329	29
	Involvement	.7124	.02287	29
outstnd	Advocacy	4.0748	.10995	3
	Motivation	3.9675	.02208	3
	Involvement	.7177	.02065	3
Total	Advocacy	3.7567	.17674	97
	Motivation	3.9275	.06994	97
	Involvement	.6973	.03568	97

76x42mm (600 x 600 DPI)

BMJ Open

Relationship between employee engagement scores and service quality ratings: analysis of the National Health Service staff survey across 97 acute NHS Trusts in England and concurrent Care Quality Commission outcomes (2012–2016)

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2018-026472.R2
Article Type:	Research
Date Submitted by the Author:	25-May-2019
Complete List of Authors:	Wake, Mark; University Hospitals of Leicester NHS Trust, ENT Green, William; University of Leicester School of Management
Primary Subject Heading:	Health services research
Secondary Subject Heading:	Medical management, Nursing
Keywords:	CQC, Engagement, secondary care, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

SCHOLARONE™
Manuscripts

TITLE

Relationship between employee engagement scores and service quality ratings: analysis of the National Health Service staff survey across 97 acute NHS Trusts in England and concurrent Care Quality Commission outcomes (2012–2016)

Authors

Mark Wake[1], William Green[2]

Author Affiliations

[1] University Hospitals of Leicester, Infirmary Square, Leicester LE1 5WW, UK: (drmarkwake@aol.com)

[2] School of Business, College of Social Sciences, Arts and Humanities, University of Leicester, Leicester LE1 7RH, UK: (wg32@leicester.ac.uk)

Correspondence

Dr Mark Wake, ENT Department, Level 3 Balmoral Building, Leicester Royal Infirmary, Infirmary Square, Leicester, LE1 5WW. Tel: 0044 116 254 1414: (drmarkwake@aol.com).

Abstract

Objective This research explores measures of employee engagement in NHS acute Trusts in England and examines the association between organization-level engagement and the CQC's quality ratings.

Design Cross-sectional.

Setting 97 acute NHS Trusts in England.

Participants 97 NHS acute Trusts in England (2012–2016). Data includes provider details, staff survey results and CQC reports. Hybrid Trusts or organizations affected by recent mergers are excluded.

Outcome Measures Analysis uses organization-level employee engagement and CQC quality ratings.

Results Employee engagement is affected by organizational factors, including patient bed numbers ($\beta=-0.46$, $p<0.05$) and financial revenue ($\beta=0.38$, $p<0.05$). CQC ratings are predicted by overall employee engagement score ($\beta=0.57$, $p<0.001$) and financial deficit ($\beta=-0.19$, $p<0.05$). The most influential employee engagement dimension on provider ratings is 'advocacy' ($\lambda=0.54$, $p<0.001$). Analysis support the notion that employee engagement can be predicted from advocacy scores alone (eigenvalue=4.03). Better still, combining advocacy scores from the previous year's survey or adding in motivation scores is a highly reliable indication of overall employee engagement (95.4% of total variance).

Conclusions NHS acute Trusts with high employee engagement scores tend to have better CQC ratings. Trusts with a high financial deficit tend to have lower ratings. Employee engagement subdimensions have different associations with CQC ratings, the most influential dimension being advocacy score. A two subdimension

1
2
3 model of engagement efficiently predicts overall employee engagement in NHS
4
5 acute Trusts in England. Healthcare leaders should pay close attention to the
6
7 proportion of employees who would recommend their organization as a place to work
8
9 or receive treatment, because this is a proxy for the level of engagement, and it
10
11 predicts CQC ratings.
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For peer review only

Article Summary

Strengths and limitations of this study

- Engagement data is taken from a large national survey of NHS employees.
- The survey results coincide with the first national inspection programme of all acute NHS Trusts in England, by the Care Quality Commission (CQC).
- A conceptual model is used to analyze the association between the subdimensions of employee engagement and perceived quality (as measured by the CQC).
- The predictor variables are taken from a single self-reported source which risks common method variance.
- The sample and cross-sectional design limit conclusions about causation or generalizability.

Introduction

This study considers organization-level measures of work engagement taken from the annual National Health Service (NHS) staff surveys (NSS) 2012–2016.[1] It examines the effect that organizational size, status and financial revenue have on overall engagement and compares engagement scores to provider ratings for NHS acute Trusts in England. Employee engagement research typically uses a multidimensional construct of engagement, so the study applies this approach to the NHS. It investigates the associations between NSS engagement subdimensions and the perceived quality of provider organizations (as reported by the Care Quality Commission).

Organizational factors

Saks[2] suggests that employees repay their organization for the resources they receive through their levels of engagement and to some extent engagement reflects the relationship employees have with their organizations. Maslach et al.[3] emphasized the important role that organizations play in providing these valued resources by allowing employees some autonomy or by providing feedback and learning opportunities. The engagement-promoting capacity of job resources was also identified by Bakker et al.[4] who described job resources as the physical, social or organizational factors which reduce job demands and play a motivational role at work. Job resources reduced the perceived demands of a job and appeared to protect employees from burnout, particularly during sustained periods of high work intensity. From a healthcare perspective, Hakanen et al.[5] in a longitudinal study of over 2500 Finnish dentists reported a positive, step-wise relationship between job resources, engagement and personal initiative or innovativeness. In another Finnish study of 409 healthcare

1
2
3 workers, Maumo et al.[6] concluded that the best predictors of engagement
4
5 were self-esteem and the ability of employees to control some aspects of their
6
7 work (job resources were more influential than job demands). Relatedly, job
8
9 resources have been linked to engagement amongst nurses and doctors
10
11 working in hospital environments.[7-8]
12
13

14
15 In the UK, recruitment and retention of staff has historically been more
16
17 successful in large, prestigious teaching hospitals with considerable resources
18
19 at their disposal. Several studies have linked the structure of healthcare
20
21 organizations to measures of performance including efficiency, patient
22
23 outcomes, staff and patient satisfaction.[9-10] There has been a reporting bias
24
25 towards “bigger is better” but the evidence for such a general assertion is
26
27 weak.[11] West et al[12] found that the type of NHS organization influenced
28
29 employee engagement but the key organizational characteristics which predict
30
31 employee engagement in an acute healthcare environment are uncertain.
32
33 Parsimoniously, this research examines the results of recent NHS staff surveys
34
35 for evidence that employee engagement is linked to organizational
36
37 characteristics which may be a proxy for available resources, using the following
38
39 hypothesis H1(a) and H1(b):
40
41
42
43
44

45 *H1 (a) NHS employee engagement will be related to Trust size (bed numbers or*
46
47 *revenue).*
48
49

50 *H1 (b) NHS employee engagement will be related to Trust type or status*
51
52 *(Foundation/non-Foundation, teaching/non-teaching hospital*
53
54

55 *Higher levels of employee engagement will be associated with large teaching*
56
57 *hospitals, Foundation Trusts or organizations in strong financial positions.*
58
59
60

Employee engagement and performance (CQC ratings)

The proposition that employee engagement has a positive effect on organizational performance is not new.[13] Employee engagement has been associated with improved performance in many industries, albeit there is limited healthcare evidence. Engaged employees tend to be intrinsically motivated, are more likely to achieve their goals and learn from mistakes and engagement has been associated with organization-level quality outcomes.[14-16] Engagement amongst healthcare professionals is considered high compared to other industries and hospitals with more engaged nurses tended to deliver better patient care and have superior safety records compared to those with less engaged employees.[14] Although there are few studies from the NHS, the historical link between NHS engagement and quality was reported in West et al (2011). Staff engagement had a significant effect on patient satisfaction, hospital mortality rates, infection rates, absenteeism, staff turnover and Annual Health Check ratings (a forerunner of QCC ratings).

One controversial measure of NHS provider quality is the use of CQC healthcare ratings by the Department of Health and Social Care. In 2016, the CQC completed the first national inspection programme of NHS acute Trusts in England and rated each organization as: outstanding, good, requires improvement or inadequate. The CQC highlighted the variation in quality and attributed this to factors such as culture, leadership and staff engagement.[17] It follows, that employee engagement is worth investigating as a predictor of CQC ratings. Based on the literature, the direct relationship between engagement and perceived quality of NHS acute Trusts is expressed as our second hypothesis (H2):

1
2
3 *H 2: There is a positive relationship between the levels of staff engagement and*
4 *Trust performance so overall employee engagement in acute NHS Trusts will*
5 *predict their CQC ratings.*
6
7
8
9

10 *Engagement subdimensions*

11
12
13 Although Kahn[18] was the first to define work engagement as a multi-dimensional
14 construct related to meaningfulness, safety and availability, subsequent
15 developmental theories conceptualized engagement as the positive antithesis to
16 burnout. Contemporary research has been strongly influenced by Schaufeli and
17 Bakker's[15] definition of engagement as a "positive, fulfilling, work-related state of
18 mind characterized by vigor, dedication and absorption". Vigour was associated with
19 energy, resilience, persistence and greater effort. Dedication was characterized by
20 involvement and associated with a personal sense of significance, pride, inspiration
21 and challenge. The third sub-dimension (absorption) was linked to being happily
22 engrossed at work so that time passed quickly.
23
24
25
26
27
28
29
30
31
32
33
34
35

36
37 The NSS questionnaire was based on the Utrecht Work Engagement Scale
38 (UWES) which operationalizes Schaufeli and Bakker's definition of engagement
39 above.[15] The final survey questions were influenced by the NSS Improvement
40 Board to reflect employee engagement in the context of the organization and its
41 environment. These modifications were tested by cognitive interviewing for
42 validity.[19] Overall-engagement scores were synthesized from three subdimension
43 scales: motivation, advocacy and involvement. NSS motivation is similar to
44 psychological engagement and includes elements of intrinsic motivation, dedication
45 and absorption at work. Advocacy is strongly linked to care standards and reflects
46 the perceptions that staff have of the organization's patient-centeredness and the
47 level of pride they feel at work. It also reflects the willingness to recommend the
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 organization as an employer or healthcare provider. Involvement is a “practitioner”
4
5 measure which covers employee involvement in decision-making, change
6
7 management and relationships with supervisors.[20]
8
9

10 Recent studies have suggested that employee engagement is better represented by
11
12 a two-subdimension model. For example, Salanova et al.[21] reported that only two
13
14 of Schaufeli and Bakker’s[15] dimensions predicted employee engagement, namely
15
16 vigour and dedication. The ‘absorption’ subdimension was considered a
17
18 consequence of employee engagement, not an antecedent. The debate about the
19
20 antecedents of employee engagement prompted the research question:
21
22
23

24
25 *In NHS survey instruments, overall engagement is calculated from three*
26
27 *subdimension scales. Which subdimensions are the ‘core dimensions’ for NHS*
28
29 *employee engagement? (Figure 1)*
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Methods

For consistency, this research focuses on NHS acute Trusts, whilst organizations in unusual circumstances (recent mergers, acquisitions or significant reconfigurations) and hybrid organizations (mixed community and acute services) are excluded. The resulting sample is 97 NHS acute Trusts in England. This study does not include NHS services in the rest of the UK, as they fall under different regulatory arrangements. Although this study uses Trust-level data, representativeness and comparability are assumed because a weighting procedure is applied to NSS returns based on a hypothetical national staff profile for each type of organization. To allow for historical comparisons, data weighting is regularly reviewed.[22]

Organization characteristics

All data is publicly available in the UK on NHS acute Trust websites, including NHS Trust Board papers and quality accounts. Organizational characteristics are selected as follows (to identify or reduce confounding effects). Acute Trusts in England have a wide range of operating incomes that directly affects available resources. Trusts with significant financial deficits can have constraints on resources so the size of Trust deficit as a percentage of financial turnover is used. Although bed numbers are an indicator of organizational size, it may also reflect an element of work intensity, and so could affect performance. Teaching hospitals affiliated to reputable academic organizations are associated with higher performance, so teaching status is included.[9-10] 'Foundation Trust' status is awarded to higher-performing NHS organizations and is intended to give them more autonomy and greater financial flexibility; and therefore is likely to impact on culture, climate and resources.

Engagement and performance (CQC ratings)

1
2
3 NHS acute Trust data is extracted from NSS reports. For each Trust, survey data
4
5 corresponding to the year of their CQC inspection and the previous year is used.

6
7 The mean average annual response rate for acute Trusts for 2012–2016 is: 49%
8
9 (2012–13), 42% (2013–14), 41% (2014–15) and 43% (2015–16) respectively,
10
11 comprising between 269,000 and 456,000 respondents per survey year.
12
13

14
15 Trust-level engagement scores are summarized for each organization using the
16
17 weighting procedure described above. Organization scores are then compared to
18
19 the national average for organizations of a similar type. Benchmark data is obtained
20
21 from the summary reports provided to individual NHS Trusts.[22]
22
23

24
25 The CQC inspected all 136 acute Trusts and 17 specialist Trusts in England
26
27 between September 2012–June 2016 and published the results on their website.
28
29 This included a total of 265 non-specialist hospital sites or locations and 27 specialist
30
31 hospitals operated by these Trusts. Assessment of core health services included:
32
33 children and young people, intensive/critical care, maternity and gynaecology, end of
34
35 life care, outpatients and diagnostic imaging, surgery, urgent and emergency
36
37 services and medical care including older people. In making their assessments, the
38
39 CQC uses a set of 150 indicators obtained from various sources (including
40
41 inspection visits). They rate organizations under five domains (safe, effective, caring,
42
43 responsive and well-led). Each organization receives an overall rating as:
44
45 outstanding, good, needs improvement or inadequate.[17] (Supplementary Table 1)
46
47
48
49

50 *NSS dimensions of employee engagement*

51

52
53 As discussed, a three subdimension model of employee engagement is captured in
54
55 the NSS. Each dimension is scored across a number of items, using a five-point
56
57 scale or yes/no answers. 'Overall engagement' scores for each respondent is
58
59
60

created by taking the mean average from the three subdimension scores (motivation, advocacy and involvement). The subdimension scores have strong intercorrelations (Pearson's, $p < 0.001$) and convergent validity. Factor loadings are all > 0.7 , Bartlett's test $p < 0.001$, Kaiser Myer Olkin = 0.71. Overall engagement score for each organization is calculated using a weighted mean average (to account for occupational differences between Trusts). Overall engagement Cronbach's alpha = 0.70 and the standardized regression weight delta < 0.2 for subdimension scales (using a single common factor approach). (Table 1)

Table 1: The NHS staff survey calculates overall engagement from three scales: motivation, advocacy and involvement.

Dimension	Description
Motivation	Staff motivation at work (Cronbach's alpha=0.81)
Advocacy	Recommend the organization as a place to work or receive treatment (Cronbach's alpha=0.74).
Involvement	Ability to contribute towards improvement at work (Cronbach's alpha=0.86).

Patient and Public Involvement

Patients and public were not involved in this study.

Ethics approval

Ethical approval was obtained from the Ethics Sub-Committee for Media and Communication and School of Management, University of Leicester.

Results

Employee engagement is treated as an organization-level variable. Scatter plots of standardized residuals show a roughly rectangular distribution with central clustering, so the assumption of linearity is met. There is no evidence of a systematic pattern of residuals and there are no residuals outside the accepted range for Trust-level data. Only two organizations have Mahalanobis distances greater than the critical value (e.g. $\chi^2=18.47$ for 4 degrees of freedom) which is around the 2% recommended tolerance. Similarly, Cook's distances are <1 , so the outliers do not have an undue influence on the predictability of the model. As a result, no acute Trusts with complete data sets are excluded.

Organizational factors and employee engagement

Employee engagement is compared to Trust size (financial turnover, bed numbers), type (Foundation/non-Foundation) and teaching status (teaching/non-teaching hospital). Univariate analysis of variance (Anova) shows that the model is statistically significant compared to chance ($p<0.05$). Regression analysis is used to quantify the % variance in employee engagement explained by the predictor variables ($R^2=0.104$, adjusted $R^2=0.064$, standard error=0.09). This suggests that the combined predictors explain 6-10% of the variance. The significant contributions are bed numbers ($\beta=-0.46$, $p<0.05$) and financial turnover ($\beta=0.38$, $p<0.05$).

Employee engagement and performance (CQC ratings)

The data is analyzed using hierarchical multiple regression: block 1 comprises control variables (financial deficit as % turnover, bed numbers, and Trust status) and block 2 Trust engagement scores (Supplementary Table 2).

In this way, the model assesses the contributions of predictor variables to the

variance in the dependent variable. The model is a statistically significant predictor of CQC ratings (Anova; $F=11.42$, $p<0.001$). The combined effect of the model's variables is 39% of CQC ratings variance. The control variables account for approximately 10% of CQC ratings. The change in R^2 (ΔR^2) in block 2 shows that engagement scores account for an additional 29% of variance ($p<0.001$, standard error=0.53). The statistically significant predictors are financial deficit ($\beta=-0.19$, $p<0.05$) and engagement score ($\beta=0.57$, $p<0.001$). The regression coefficients are shown in Table 2.

Table 2: Hierarchical multiple regression – the conceptual model predicts CQC ratings. Engagement scores and Trust financial deficits are the significant predictors.

	Unstandardized coefficients		Standardized coefficients	Change statistics			
	R	R ²	Adjusted R ²	Std.error	ΔR^2	ΔF	p value
Controls ^{a,b}	0.312	0.097	0.057	0.638	0.097	2.423	.054
Full model ^{a,c}	0.625	0.391	0.357	0.527	0.294	42.891	<0.001***

a. Dependent variable: CQC rating; * $p<0.05$, ** $p<0.005$, *** $p<0.001$

b. Predictors: (Constant), Deficit %, FT or non FT, Teaching status, Bed numbers

c. Predictors: (Constant), Deficit %, FT or non FT, Teaching status, Bed numbers, Engagement score

Employee engagement dimensions and perceived performance

Discriminate analysis is used to assess the ability of the employee engagement dimension scores to predict CQC ratings (Supplementary Table 3). The assumption of multivariate normality is met with Box's M, $p>0.05$. Univariate Anova suggests a statistically significant difference between the three engagement dimensions.

Canonical discriminate functions show a statistically significant relationship between

the discriminating function (1) and the engagement subdimension scores. The (eigenvalues) canonical correlation=0.67, demonstrating good group separation by a discriminate function. That function explains 95.7% of the variance between the engagement dimensions ($\lambda=0.54$, $p<0.001$). Analysis shows that the factor driving discriminate function 1 is advocacy score, with the largest absolute correlation=0.96 (Table 3).

Table 3: Discriminate analysis – the intercorrelations and correlations between engagement subdimensions and CQC ratings can be represented by a non-correlated discriminate function (Function 1).

Function	Eigenvalue	% of variance	Cumulative %	Canonical correlation
1	0.801	95.7	95.7	0.667
2	0.036	4.3	100.0	0.185
3	0.000	0.0	100.0	0.020

Core dimensions of employee engagement in the NHS

Principal component analysis is used to test for a latent effect using data from the year of and the year before (Yb4) CQC inspections. Standard assumptions are met (sample >10 subjects per variable, strong intercorrelations $r>0.3$, Bartlett's test $p<0.001$, Kaiser Myer Olkin=0.76). The component matrix supports retaining a 1-factor solution since only 1 component had eigenvalue>1. The retained factor is advocacy score (eigenvalue=4.03), which explains approximately 67% of the total variance in the engagement data. By adding advocacy scores from the year before CQC inspections this increases to 80%. Combined advocacy and motivation scores from both years explain 95% of the total variance (Table 4).

Table 4: Principal component analysis – advocacy scores from the year of and year before CQC inspections effectively predict employee engagement. Combined advocacy and motivation scores are a reliable indicator of overall engagement which can be efficiently represented by a two dimension model.

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1.Advocacy	4.033	67.223	67.223	4.033	67.223	67.223
2.AdvocacyYb4 ^a	0.748	12.462	79.684	-	-	-
3.Motivation	0.545	9.088	88.772	-	-	-
4.MotivationYb4 ^a	0.398	6.629	95.401	-	-	-
5.Involvement	0.182	3.042	98.442	-	-	-
6.InvolvementYb4 ^a	0.093	1.558	100.000	-	-	-

^aYb4 = year before CQC inspection

Discussion

Engagement is a popular but imprecise term with various definitions, models and measurement tools used in academic research. Conceptual models tend to consider engagement in terms of job demands, job resources and personal resources,[4-5,23]. In this context; the demands of a job or available resources extend beyond management styles, work intensity, materials or equipment to include employee autonomy, social support, optimism, coaching, feedback, personal development, self-efficacy and self-esteem. Adequate resources are an important motivational force at work because they reduce the perceived demands of a job, particularly when work intensity is consistently high.[5] Maumo et al.[6] reported that the loss of these resources can produce a downward spiral, particularly when employees sense a loss of autonomy or the inability to control aspects of their work.

Simpson's review emphasized how organizational factors affected the engagement of nurses (in addition to job attributes and leader behaviours).[7] Our findings emphasize that nuancing is required over the assumption that organizational structure has a strong effect on engagement. Our analysis shows that Trust size, type and status explain 6-10% of the variance in engagement scores which partially supports our first hypothesis, H1(a). Although the size of NHS acute Trusts is related to engagement scores, the two indicators of organizational size have opposite associations. Trusts with higher incomes (turnover) tended to have more engaged employees but organizations with more beds are associated with lower engagement. Although prestigious UK teaching hospitals or Foundation Trusts (with considerable resources at their disposal) have historically found recruitment and retention of employees less challenging than small providers, in our study organization status is not a significant predictor of employee engagement. This does not support H1(b). It

1
2
3 is possible that personal resources (positive self-evaluations) have a strong influence
4 on perceived job resources/organization status when determining overall
5
6 engagement. We speculate that the most influential organizational factors on
7
8 engagement are related less to structure and more to employees' perceptions of the
9
10 culture, leadership style and their working environment.[24]
11
12
13
14

15 There is growing interest in workplace factors that influence employee engagement
16 due to the apparent effect that engagement has on organization-level performance
17 and personal well-being. Reported benefits to businesses included: improved
18 productivity, profitability and customer satisfaction.[4,16,25-26] Engagement
19 research in healthcare settings tends to focus on health outcomes or quality metrics
20 rather than business performance.
21
22
23
24
25
26
27
28

29 Whist comparisons between countries and industrial sectors is problematic,
30 worldwide, the NHS is ranked fifth for number of employees and the NSS is
31 considered to be the largest annual employee survey of its kind. West and Dawson
32 (2012) reported that levels of employee engagement predicted hospital quality
33 ratings (in addition to mortality, infection rates, patient satisfaction and absenteeism).
34 These studies were based on survey data from 2008-2009 but despite a change in
35 the regulatory regime and some outcome measures, our study suggests that the link
36 between employee engagement and quality ratings in UK secondary healthcare has
37 been maintained [20]. This finding supports our second hypothesis. The CQC
38 highlights that financial pressures in provider organizations are associated with lower
39 quality ratings, which is supported by the finding in our study: NHS acute Trusts with
40 higher financial deficits as a proportion of their turnover tend to achieve lower CQC
41 ratings. Although the CQC reported that good internal financial management is
42 linked with better hospital ratings, this should be taken in the context of the prevailing
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 external environment (particularly the pressure to control costs and prioritize
4 effectiveness). CQC ratings do not decipher between organizations that are “better
5 at balancing their budgets” and the root causes of the financial “deficits” in
6 challenged Trusts.[17] There are widespread calls for investment in the NHS but it
7 remains to be seen what level of investment is required before a ‘quality dividend’ is
8 apparent in secondary care providers in the UK.
9

10
11 Engagement is generally considered to be a multidimensional construct and,
12 adopting this approach, the NSS uses a three subdimension model to assess
13 overall engagement. Schaufeli et al.[15] described the subdimensions of
14 engagement as vigour, dedication and absorption. This model has been widely
15 adopted, indeed Simpson[7] recommended it be applied to all nurse-related
16 research in order to provide a consistent approach. Although the models are not
17 directly compatible, Schaufeli’s vigour dimension links to NSS motivation and
18 dedication is related to the NSS involvement or advocacy dimensions. Our study
19 suggests that advocacy is the most influential dimension on CQC ratings. Better
20 ratings tended to occur in organizations where employees thought the care of
21 patients or service users was the organization’s top priority and where they
22 recommend their organization as a place to work or receive treatment. This is
23 consistent with CQC[17] which reported that “staff in Trusts that have received
24 higher ratings tend to recommend their organisation as a place to work and/or
25 receive treatment. Furthermore, our analysis suggests that advocacy scores
26 explain most of the variance in overall engagement scores. This implies that NHS
27 employee engagement could be efficiently predicted by simply determining
28 advocacy scores in future surveys. Alternatively, overall engagement could be
29 reliability assessed by using a two subdimension model of engagement (advocacy
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 plus motivation). This is consistent with Salanova et al.[21] and Maumo et al.[6]
4 who reverted to a two-dimension model of engagement, concluding that vigour and
5 dedication were the core dimensions of engagement in healthcare workers.
6
7

8 Engaged employees choose to employ their energy whilst at work, they tend to be
9 aware of their business context, identify with their role, are attentive and absorbed
10 when performing their job.
11
12

13 The NSS advocacy scale contains a strong element of employee endorsement and
14 has 2/3 questions that are specific to healthcare. In this context, it is consistent with
15 self-assessment by employees of their psychological state at work but diverges
16 from other measurement tools (in that the emphasis is organizational engagement).
17 Although this approach has utility, it could reflect a general attitude of employees
18 towards the employer rather than the traditional view of work engagement used in
19 most empirical research.[27,28] This study does not seek to replace existing theory
20 but rather explores the functional relationships acting on and from engagement in a
21 healthcare setting. In broad terms, engagement as a construct may reduce to its
22 dimensions but these dimensions cannot reduce to overall engagement. By the
23 same token, the dimensions of engagement do not entirely explain engagement but
24 may be used to measure it. This type of non-representativeness is permissible
25 because it is apparent, pragmatic and accommodative to the context.
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47

48 *Conclusion*

49
50 This study provides evidence that the NSS measure of 'overall' employee
51 engagement predicts regulator's ratings of NHS acute Trusts in England.
52

53 Organizations with higher engagement scores tend to have better CQC ratings. This
54 research also provides new evidence that the NSS engagement dimensions have
55 different associations with these ratings. Specifically, it shows that the most
56
57
58
59
60

1
2
3 influential predictor of CQC ratings is advocacy score (employees think the care of
4 patients and service users is the organization's top priority, they would recommend
5 their organization to others as a place to work and would be happy with the standard
6 of care provided by the organization if a friend or relative needed treatment). Overall
7 engagement in future NHS surveys could be reliability assessed by using a two
8 subdimension model (advocacy and motivation) rather than current three
9 subdimension model.
10
11
12
13
14
15
16
17
18
19

20 *Implications*

21
22 Theoretically, senior managers are best placed to modify the working environment,
23 provide resources, moderate job demands and create the conditions that foster
24 employee engagement. However, the pressure to control costs and prioritize
25 effectiveness may limit the impact of lessons learned from engagement research.
26
27 Many people currently working in or being cared for in NHS acute Trusts in England
28 are aware of the changing environment and recognize the pressures caused by
29 externally driven reforms, high work-intensity and rising job demands experienced by
30 many healthcare professionals. Alarming, these are the very conditions which have
31 been associated with higher levels of employee burnout.[14]
32
33
34
35
36
37
38
39
40
41
42
43

44 Healthcare organizations interested in improving engagement and quality ratings
45 should pay close attention to the proportion of employees who would recommend
46 their organization as a place to work or receive treatment, because this is a proxy for
47 the level of employee engagement, and it predicts CQC ratings
48
49
50
51
52

53 *Study limitations*

54
55
56 The study uses a cross-sectional design which limits any conclusions about
57 causation. Although the study period is 2012–2016, the data extraction was
58
59
60

1
2
3 determined by the timing of CQC inspections, so a longitudinal design would better
4 identify the factors which consistently influence employee engagement and
5
6 organizational performance. It is difficult to directly compare this study with research
7
8 based on the UWES because the NHS measure of engagement is a synthesis of
9
10 psychological engagement (used in most academic research) and organizational
11
12 engagement (used in most practitioner research). Although the risk of reverse
13
14 causality is acknowledged (CQC ratings predict engagement), during the study
15
16 period the annual organization-level engagement scores were stable whilst most
17
18 Trusts were only rated once by the CQC.
19
20
21
22

23
24 The sample is limited to NHS acute Trusts in England, which limits the
25
26 generalizability of the conclusions. The predictor variables are taken from a single
27
28 self-reported source, therefore using different sources, more instruments or adding
29
30 objective measurements would reduce common method variance.[7] However the
31
32 criterion variable was from a different source and time which mitigates this bias.[29]
33
34 Self-reported observations can exaggerate relationships amongst variables and
35
36 cannot exclude effects due to latent variables. This research uses aggregated
37
38 engagement scores whereas most previous studies have used non-aggregated
39
40 scores. Shuck and Wollard[30] claimed that looking at engagement at the level of an
41
42 organization rather than the individual may be necessary but it “distorts the nature of
43
44 the concept”.

45 46 47 48 49 *Directions of future research*

50
51
52 Improving healthcare quality is a high priority in developed economies and so
53
54 research designed to identify factors that predict quality performance should be
55
56 encouraged. Engagement as a predictor of employee or organization performance is
57
58 supported by several empirical studies.[15,25] Research that overcomes the
59
60

1
2
3 methodological issues identified in our study may provide stronger empirical
4 evidence of the economic and healthcare benefits of an engaged workforce.
5
6

7
8 Research has tended to focus on individual engagement but there is a clear need for
9
10 more group-level studies particularly in service industries where many people work in
11
12 teams.[21] To facilitate this research, the instruments currently used to measure
13
14 individual engagement need to be tested at different levels of an organization.
15
16

17
18 Whilst acknowledging the recommendation that a common definition of engagement
19
20 be used in future research it would nevertheless be interesting to test if the strong
21
22 influence of employee endorsement seen in our study, is more generalizable.[7]
23
24

25
26 Finally, future studies designed to identify the interventions that increase and
27
28 maintain staff engagement will be of value to academia, business schools and HRM
29
30 professionals alike.
31
32

33 34 35 **Acknowledgements** 36

37
38 We thank the Picker Institute for supplying individual Trust reports and for their
39
40 prompt response to data requests and other information. We are grateful to Rabia
41
42 Imtiaz for her help with this study. She provided some organizational details used in
43
44 this research and independently verified the CQC ratings issued to acute Trusts in
45
46 2013-2016. We acknowledge Warren Smith and Stephen Wood, both University of
47
48 Leicester, who commented on earlier drafts of this paper. We appreciate the
49
50 excellent copyediting by Patricia Hewson.
51
52
53
54
55
56
57
58
59
60

Footnotes

Contributions: MW conceived the research and carried out the statistical analysis.

MW and WG contributed to the manuscript and approved the final version.

Competing interests: There are no competing interests for any author.

Funding: This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors. Open access publishing costs were provided by the University of Leicester.

Disclaimer: With the exception of direct quotes, the views and opinions expressed therein are those of the authors.

Patient consent: Not required as patients were not involved in the study.

Provenance and peer review: Not commissioned; externally peer reviewed.

Data sharing statement: Survey data are available from <http://www.nhsstaffsurveys.com> and <https://www.cqc.org.uk>

References

1. NHS England. NHS staff survey. www.nhsstaffsurveys.com/Page/1056/Home/NHS-Staff-Survey-2016 (accessed 24 Jul 2018).
2. Saks AM. Antecedents and consequences of employee engagement, *J Manage Psychol* 2006;21:600-19.
3. Maslach C, Schaufeli WB, Leiter MP. Job burnout, *Annu Rev Psychol* 2001;52:397-422.
4. Bakker AB, Albrecht SL, Leiter MP. Key questions regarding work engagement. *Eur J Work Organ Psy*. 2011;20(1):4-28.
5. Hakanen JJ, Perhoniemi R, Toppinen-Tanner S. Positive gain spirals at work: from job resources to work engagement, personal initiative and work-unit innovativeness. *J Vocat Behav*. 2008;73(1):78-91.
6. Maumo S, Kinnunen U, Ruokolainen M. Job demands and resources as antecedents of work engagement: a longitudinal study. *J Vocat Behav*. 2007;70(1):149-71.
7. Simpson MR. Engagement at work: a review of the literature. *Int J Nurs Stud*. 2009;46(7):1012-24.
8. Prins JT, Hoekstra-Weebers JE, Gazendam-Donofrio SM, et al. Burnout and engagement among resident doctors in the Netherlands: a national study. *Medical Education* 2010;44(3):236-47.
9. Papanikolaou PN, Christidi GD, Ioannidis JP. Patient outcomes with teaching versus nonteaching healthcare: a systematic review. *PLoS Med*. 2006;3(9):e341.
10. Sjetne IS, Veenstra M, Stavem K. The effect of hospital size and teaching status on patient experiences with hospital care: a multilevel analysis. *Medical Care* 2007; 45(3):252-8.
11. Brand CA, Barker AL, Morello RT, et al. A review of hospital characteristics associated with improved performance. *Int J Qual Health Care* 2012;24(5):483-94.
12. West M, Dawson J, Admasachew L, et al. NHS staff management and health service quality. Department of Health, 2011.
13. Gruman JA, Saks AM. Performance management and employee engagement. *Hum Resour Manage R* 2011;21(2):123-36.
14. Laschinger HK, Leiter MP. The impact of nursing work environments on patient safety outcomes: the mediating role of burnout engagement. *J Nurs Adm*. 2006;36(5):259-675.

15. Schaufeli WB, Bakker AB. Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J Organ Behav.* 2004;25(3):293–315.
16. Xanthopoulou D, Bakker AB, Demerouti E, et al. Reciprocal relationships between job resources, personal resources, and work engagement. *J Vocat Behav.* 2009;74(3):235–44.
17. CQC. State of Care 2016. www.cqc.org.uk/content/cqc-reveals-comprehensive-picture-quality-hospital-care-england (accessed 24 Jul 2018).
18. Kahn WA. Psychological conditions of personal engagement and disengagement at work, *Academy of management journal* 1990;33:692-724.
19. Admasachew L, Dawson J. Staff engagement in the NHS—a multilevel analysis, *Aston University* 2010.
20. West M, Dawson J. Employee engagement and NHS performance. *The King's Fund* 2012:1–23.
21. Salanova M, Lorente L, Chambel et al. Linking transformational leadership to nurses' extra-role performance: the mediating role of self-efficacy and work engagement. *J Adv Nurs.* 2011;67(10):2256–66.
22. Picker Institute. Making sense of your staff survey. www.nhsstaffsurveys.com/Page/1019/Past-Results/Staff-Survey-2016-Detailed-Spreadsheets/ (accessed 24 Jul 2018).
23. Nahrgang JD, Morgeson FP, Hofmann DA. Safety at work: a meta-analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. *J Appl Psychol.* 2011;71:1–24.
24. Fiabane E, Giorgi I, Sguazzin C, et al. Work engagement and occupational stress in nurses and other healthcare workers: the role of organisational and personal factors. *J Clin Nurs.* 2013;22:2614–24.
25. Harter JK, Schmidt FL, Hayes TL. Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta-analysis. *J Appl Psychol.* 2002;87(2):268–79.
26. Lowe G. How employee engagement matters for hospital performance. *Healthcare Q* 2012;15(2):29–39.
27. Swanberg JE, McKechnie SP, Ojha MU, et al. Schedule control, supervisor support and work engagement: A winning combination for workers in hourly jobs? *J Vocat Behav.* 2011;79(3):613-24.
28. Fletcher L, Robinson D, Truss C, et al. Measuring engagement and interpreting survey results. *IES* 2014:1-25.

- 1
2
3 29. Podsakoff PM, MacKenzie SB, Lee J, et al. Common method biases in
4 behavioral research: A critical review of the literature and recommended remedies. *J*
5 *Appl Psychol* 2003;88:879.
6
7 30. Shuck B, Wollard K. Employee engagement and HRD: a seminal review of the
8 foundations. *Human Resour Dev Rev.* 2010;9(1):89–110.
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For peer review only

Legends to figures and tables

Figure 1

Conceptual model – In annual employee surveys, NHS engagement scores are synthesized from three subdimension scores. The dimensions of engagement may have differential associations with CQC ratings (which are a controversial indicator of the perceived quality of NHS providers in England).

Table 1

The NHS staff survey calculates overall engagement from three scales: motivation, advocacy and involvement.

Table 2

Hierarchical multiple regression – the conceptual model predicts CQC ratings. Engagement scores and Trust financial deficits are the significant predictors.

Table 3

Discriminate analysis – the intercorrelations and correlations between engagement subdimensions and CQC ratings can be represented by a non-correlated discriminate function (Function 1).

Table 4

Principal component analysis – advocacy scores from the year of and year before CQC inspections effectively predict employee engagement. Combined advocacy and motivation scores are a reliable indicator of overall engagement which can be efficiently represented by a two-dimension model.

Legends to supplementary tables

Supplementary Table 1

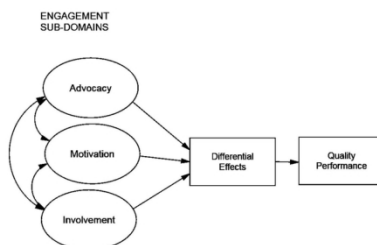
Schematic of CQC ratings matrix – Provider ratings are reported in five domains which are defined in the table

Supplementary Table 2

Descriptive statistics of study variables

Supplementary Table 3

Descriptive statistics for discriminate analysis – CQC rating categories and engagement subdomains are shown



76x42mm (600 x 600 DPI)

Rating	Domain	Definition
Outstanding	Safe	protecting people from abuse and avoidable harm and is rated across 3 areas; culture, staffing and environment
Good	Effective	treatment and support achieves good outcomes, promotes a good quality of life and is based on the best available evidence
Needs improvement	Caring	staff involve and treat people with compassion, kindness, dignity and respect
Inadequate	Responsive	services are organized so that they meet people's needs
	Well-led	leadership, management and governance of the organization assures the delivery of high-quality person-centered care, supports learning and innovation, and promotes an open and fair culture

Peer review only

	Mean	Std Deviation	n
CQC Rating	1.28	.657	97
Beds	837.5	361.149	97
Teaching	.30	.462	96
FT	.64	.484	96
Deficit %	4.235	4.28497	96
Engagement Score	3.798	.09571	97

Peer review only

CQC	Sub- domain	Mean	Std. Deviation	n
inadeq	Advocacy	3.5709	.14822	8
	Motivation	3.8915	.06785	8
	Involvement	.6636	.02418	8
reqim	Advocacy	3.6987	.14999	57
	Motivation	3.9188	.07190	57
	Involvement	.6933	.03892	57
good	Advocacy	3.8892	.10011	29
	Motivation	3.9504	.06329	29
	Involvement	.7124	.02287	29
outstnd	Advocacy	4.0748	.10995	3
	Motivation	3.9675	.02208	3
	Involvement	.7177	.02065	3
Total	Advocacy	3.7567	.17674	97
	Motivation	3.9275	.06994	97
	Involvement	.6973	.03568	97

Peer review only