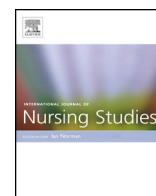


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The impact of a large-scale quality improvement programme on work engagement: Preliminary results from a national cross-sectional-survey of the 'Productive Ward'



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ABSTRACT

Background: Quality improvement (QI) Programmes, like the Productive Ward: Releasing-time-to-care initiative, aim to 'engage' and 'empower' ward teams to actively participate, innovate and lead quality improvement at the front line. However, little is known about the relationship and impact that QI work has on the 'engagement' of the clinical teams who participate and vice-versa.

Objective: This paper explores and examines the impact of a large-scale QI programme, the Productive Ward, on the 'work engagement' of the nurses and ward teams involved.

Design/methods: Using the Utrecht Work Engagement Scale (UWES), we surveyed, measured and analysed work engagement in a representative test group of hospital-based ward teams who had recently commenced the latest phase of the national 'Productive Ward' initiative in Ireland and compared them to a control group of similar size and matched (as far as is possible) on variables such as ward size, employment grade and clinical specialty area.

Results: 338 individual datasets were recorded, $n = 180$ (53.6%) from the Productive Ward group, and $n = 158$ (46.4%) from the control group; the overall response rate was 67%, and did not differ significantly between the Productive Ward and control groups. The work engagement mean score (\pm standard deviation) in the Productive group was $4.33(\pm 0.88)$, and $4.07(\pm 1.06)$ in the control group, representing a modest but statistically significant between-group difference ($p = 0.013$, independent samples t -test). Similarly modest differences were observed in all three dimensions of the work engagement construct. Employment grade and the clinical specialty area were also significantly related to the work engagement score ($p < 0.001$, general linear model) and (for the most part), to its components, with both clerical and nurse manager grades, and the elderly specialist areas, exhibiting substantially higher scores.

Conclusions: The findings demonstrate how QI activities, like those integral to the Productive Ward programme, appear to positively impact on the work engagement (the vigour, absorption and dedication) of ward-based teams. The use and suitability of the UWES as an appropriate measure of 'engagement' in QI interventions was confirmed. The engagement of nurses and front-line clinical teams is a major component of creating, developing and sustaining a culture of improvement.

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What is already known about this topic?

- This UK-designed, nurse-led, quality improvement programme was officially launched in 2007 and is currently being implemented in many countries. It aims to engage and empower ward teams with the information, skills and tools to improve the patient and staff experience whilst ‘releasing time to care’.
- Evaluations of the programme have been relatively positive in terms of adoption, spread, ward environment and process change. However there is little evidence confirming the impact on nurses, ward-teams, patients and cost-savings.
- The understanding and measure of work engagement continues to develop as a most relevant topic of interest, especially in nursing. Its relationship with quality improvement, activities and programmes is only starting to emerge.

What this paper adds

- This paper highlights the influential relationship that ‘engagement’ has on quality improvement activities and outcomes and vice versa.
- This is one of the first studies, using a control group, which demonstrates the positive impact of a national quality improvement programme, the Productive Ward on the ‘work engagement’ of the ward-teams involved.
- This paper identifies some of the factors, namely the type of ward (clinical specialty area) and employment grade, which appear to interact and effect ‘work engagement’ in quality improvement programmes like the Productive Ward.

1. Introduction

Over the last decade healthcare professionals across the world have experienced the substantial growth, development and prioritisation of quality improvement (QI) in healthcare. In the public healthcare sector this has manifested itself as ‘modernisation’ and a rapid shift from a low-cost model of healthcare provision to a new model that embraces low-cost, continuous improvement and high-quality (Mazur et al., 2012).

Recent reports in the UK and Europe however indicate that despite this focus on quality, services are falling short of some very basic standards, nationally agreed performance targets and patient expectations (Francis, 2013; Keogh, 2013; OECD, 2013). Similarly, in the United States, national healthcare disparity reports since 2006 have consistently highlighted that healthcare quality and access are suboptimal, especially for minority and low-income groups (Clancy et al., 2013).

In response to these reports and trends, healthcare organisations worldwide continually introduce and test new systems of work organisation from the world of industry and business in an attempt to improve healthcare quality, patient safety and do more with less resources. These healthcare QI efforts have taken a variety of forms and guises, including lean (Graban, 2012), six-sigma (Charles et al., 2012), total quality management (Qianmei and Chris, 2008) and the ‘model for improvement’ (Langley et al., 2009). Many

have been modified, adapted, re-packaged and re-labelled for the healthcare setting, creating some confusion, misunderstanding and scepticism amongst the teams who have to implement them (de Souza, 2009, Walshe, 2009). Examples of modified or eclectic QI initiatives recently introduced into healthcare include lean healthcare (de Souza, 2009), lean six-sigma (Glasgow et al., 2010), clinical microsystems (Gobel et al., 2012), transforming care at the bedside (Dearmon et al., 2013), and Productive Ward (Wilson, 2009).

There are some arguments for the nursing profession to be concerned about the effect and impact these new systems of work may have on the nurses and front-line clinical teams who predominantly implement them. They are often very complex social interventions with little robust evidence to suggest that they can maximise effectiveness or avoid failure in healthcare settings. The sociotechnical elements (Joosten et al., 2009), contextual elements (Ovretveit, 2011), and micro-political elements (Langley and Denis, 2011), involved in using these adapted healthcare improvement methodologies have also yet to be fully established and are not entirely understood. The intra-related elements of QI implementation are often more noticeable by their absence in a QI intervention than their presence. Poor attempts at QI implementation and ‘dabbling’ with the tools and methodologies of QI can negatively impact on employee engagement, enthusiasm and promote a lack of appetite for any improvement effort (Gollop et al., 2004). This may result in nurses and front-line clinical teams questioning the purpose of all QI initiatives and promoting an air of cynicism around QI efforts as if they are just another passing management fad (Morrow et al., 2012; Radnor et al., 2012; Walshe, 2009).

It is well recognised in the business and industry literature that the ‘employee contribution’ is central to improved business and quality outputs (Bakker et al., 2009, Harter et al., 2002, MacLeod and Clarke, 2010). To be competitive and ‘remain in the game’, the best performing companies in business and industry have no option but ‘engage’, not only the body, but the mind and soul of every employee (Ulrich, 1997). Likewise most QI practitioners in healthcare would agree that it is the employees within the team of an organisation, who make a critical difference when it comes to creating innovative ideas, thinking differently and piloting small tests of change (Graban, 2012).

Knowing what we know from the business and industry literature about the correlations and confirmed links between employee engagement/employee contribution and improved quality, performance and outputs (Harter et al., 2002; MacLeod and Clarke, 2009), it is difficult to understand why the learning from business has not yet fully translated or spread into healthcare QI implementation, performance and output (Marshall, 2009). Especially when one considers the reliance and relationship that QI in healthcare has on the solutions, methodologies and tools that have their genesis in that very industry or business base. This could be another example of the very considerable gap that exists between ‘what we know’, and ‘what we do’, when it comes to healthcare QI efforts (Shojania and Grimshaw, 2005).

There is acknowledgement that the engagement of front-line clinical teams is a necessary pre-condition for QI initiatives (Siriwardena, 2009) and improvement (The Kings Fund, 2012). A recent study of 14 quality improvement programme evaluations established that the majority of the key challenges were employee/people contribution-related and that stakeholder engagement was the key enabler for success (Dixon-Woods et al., 2012). Similar findings in relation to stakeholder engagement have also recently been reported for Lean healthcare (Holden et al., 2011; Steed, 2012) and 'Productive Ward' (White et al., 2013).

The concept that employee engagement is different from employee or job satisfaction is well established (Macey and Schneider, 2008; Maslach et al., 2001; Shuck, 2011). Employee satisfaction is distinctly related to satiation; that is the employee's individual appraisal of the many elements of their external work environment. Either the work environment meets certain satisfying characteristics, or it does not.

However, employee engagement relies on activation on the part of the individual employee, a willingness to expend discretionary effort to help the employer/organisation achieve its goal (Hallberg et al., 2006). Central to this concept is the understanding that engagement is the employee's relationship with work itself, or 'work engagement' (Wefald and Downey, 2009). Although the 'engagement' concept continues to develop, and 'employee engagement' and 'work engagement' are used interchangeably, the most accepted academic definition is 'work engagement' which is derived from Schaufeli's original construct and is succinctly defined as: 'a positive fulfilling work-related state of mind characterised by vigour, dedication and absorption' (Schaufeli et al., 2002). Significantly related to work-related attitudes (job satisfaction, job involvement, job behaviour, behaviour intentions and organisational commitment), burnout, workaholicism, well-being, boredom, satisfaction and personality, it is a distinct concept strongly related to job performance (Schaufeli, 2014). The term specifically refers to the relationship of the employee with his or her work, whereas 'employee engagement' may also include elements of the relationship with the organisation or manager (Schaufeli, 2014).

The most widely used measure of work engagement in the academic literature is the Utrecht Work engagement survey (UWES) (Shuck, 2011). The revised seventeen item scale consists of three subscales of vigour (6 items), dedication (5 items) and absorption (6 items). The psychometric properties of the UWES are well described and validated (Schaufeli et al., 2006; Schaufeli et al., 2002; Seppala et al., 2009).

Work engagement and the measure of work engagement are important contemporary healthcare employee performance and organisational management topics (Simpson, 2009a). The use of 'work engagement' as a construct and measure in nursing is becoming well established (Salanova et al., 2011; Simpson, 2009b; Warshawsky et al., 2012). It has been successfully used and correlated in the nursing literature with work experience (Hagedorn Wonder, 2012), self-transcendence

(Palmer et al., 2010), leadership (Wong et al., 2010) empowerment (Laschinger et al., 2006) and patient centred care (Abdelhadi and Drach-Zahavy, 2012).

All healthcare QI efforts require an elevated level of employee activation and effort, a sense that improvement is relevant to the patient/team/organisation and a willingness to succeed (Dixon-Woods et al., 2012). It would therefore follow that any measurement of engagement relating to QI should extend beyond the satisfying characteristics of the work environment or satisfaction with the job, and should focus on something about the individual employee or team member. Some internal characteristics that stimulate and motivate the expenditure of energy and effort, that might be linked in some way to performance and which that are so vital for the successful implementation and outcome of QI.

1.1. Background

Productive Ward is one of the most prominent lean-based healthcare QI initiatives in the UK (Waring and Bishop, 2010), and has received considerable international attention (Clews, 2011). As a model of healthcare QI it is wholly unique, in that it is reported to have full UK government backing (Nursing Management, 2008; Nursing Standard, 2012), and although designed for entire front-line clinical teams, it is reported to be specifically targeted at engaging nurses for its implementation (Rudge, 2013). It was eclectically designed to utilise the best elements of 'Lean' improvement techniques, the intrinsic motivators of social movement theory and the front line engagement theories of large-scale change for QI in a health care environment (NHS Institute and NNRU, 2010b; Robert et al., 2011). UK reports of the initiative have been positive (Gribben et al., 2009; NHS Institute and NNRU, 2010a,b,c; NHS Scotland, 2008), with up to 40% of all NHS hospitals reported to be involved (Robert, 2011). Successful implementation efforts have been reported internationally (Coutts, 2010; Davidson, 2011; van den Broek et al., 2013) adding to a growing body of related peer-reviewed publications and evaluations (White et al., 2014).

Productive Ward was designed and developed by the NHS Institute for Innovation and Improvement (NHSI) in 2005 with 3 main aims:

- To increase the proportion of time nurses spend in direct patient care,
- To improve experience for staff and for patients,
- To make structural changes to the use of ward spaces to improve efficiency in terms of time effort and money (NHS Institute and NNRU, 2010b).

Since its design and testing in 2005, it has been widely reported in the nursing and healthcare media as having had a positive impact on ward environments (Kendall-Raynor, 2010; Taylor, 2006), patient safety and care (Blakemore, 2009a,b; Nolan, 2007) and improvement (Davis and Adams, 2012; Smith and Rudd, 2010). The programme provides tools and leadership methods to engage front line staff in QI at ward level and is reported to

have influenced: leadership (Davis and Adams, 2012), work-life (Lennard, 2012), empowerment (Mumvuri and Pithouse, 2010; Wilson, 2009), and engagement (Avis, 2009; NHS Institute and NNRU, 2010a).

The initiative has 'spread' internationally and Ireland commenced a national phased implementation with a cohort of 24 wards/departments across 17 hospital sites in December 2011. This present study is based on the second phase of national implementation which commenced at the end of 2012 involving of 9 wards/departments across 7 hospital sites.

2. Methods

2.1. Aims and objectives

The aim of this study was to explore the possible relationship and association of QI activities and the work engagement of ward-teams involved in a national roll-out of the Productive Ward initiative.

The objectives were to:

- Measure work engagement in ward-based teams involved in a phase of a national roll out of Productive Ward.
- Compare these measures against a control group of similar size, from a similar clinical specialty area, who were not involved in a quality improvement programme or activity.
- Examine possible elements of the quality improvement initiative, Productive Ward, which may interact or impact the work engagement of ward-based teams.
- Make recommendations in relation to the use and suitability of work engagement as a measure for assessing how 'engaged' healthcare teams are in quality improvement programmes or interventions.

2.2. Design

The study is a national cross-sectional survey of work engagement in ward-teams (nursing and non-nursing) involved in the 'Productive Ward' QI initiative and a comparable control group.

2.3. Settings

This study involves the inclusion of an entire phase of national productive ward implementation in Ireland. The cohort contains 9 wards/units from 7 hospitals within the public health system across Ireland and includes medical, surgical, rehabilitation and elderly clinical specialty environments. A national matched (as far as possible) control group were recruited to this study from within the same public health system for comparison.

2.4. Inclusion criteria

All core ward-team members involved in direct and indirect patient care and who were assigned to the ward/unit during the start of the Productive Ward initiative were eligible and invited to participate. This included all

nurses/nurse managers, care assistants/attendants, household/domestic and clerical/administration staff.

A control group were identified and matched to the study group based on: similar size, similar specialty, organisational and ethical approval to participate. Similar criteria were applied for the recruitment of participants on the control wards/units.

Survey packs containing information sheets outlining the study's purpose, anonymity, and instructions were included with surveys and stamped addressed envelopes prior to distribution to the entire ward-team in both the Productive Ward and control group.

2.5. Description of the sample

A stratified sample of 253 ward-team members from the 9 wards/units involved in the QI initiative, Productive Ward (the total eligible population of a national phase of Productive Ward implementation) were identified through the 'project lead' in each Productive Ward and surveyed in early 2013; approximately 12 weeks into the implementation of the QI programme, and compared to a matched (approximate fit) control group. Although Productive Ward is predominantly a nurse-led initiative, all core members of the ward-team involved in direct and indirect patient care were surveyed as we believe ward-base QI interventions of this nature impact on the entire ward-team.

The stratification characteristics of the control group, a purposive sample were: consent to participate in the study, non-participation in a QI initiative, similar ward and sample size ($n = 249$), number of wards/units ($n = 9$) and judged to be a similar ward specialty/environment or match. Non-respondents were sent a postal reminder after 4 weeks.

The Productive Ward and control sample contained ward/units from a range of clinical specialty areas in both acute and non-acute clinical care environments. Both samples consisted mainly of female registered nurses aged between 25 and 44. A descriptive breakdown of participants and the clinical specialty of the wards/units are provided in the results section in Table 1 and Fig. 1.

2.6. Measures

The 17 item Utrecht Work Engagement Scale questionnaire (UWES-17), a 3-dimensional model of vigour, dedication and absorption (Schaufeli et al., 2002), was used to measure the total levels of engagement. Vigour is measured with six items, dedication with five items and absorption with six items. Each item is scored on a seven point rating scale from 0 (never) to 7 (every day).

The UWES was chosen because it is the most commonly agreed dimension (Bargagliotti, 2012), has consistently been reported as having acceptable psychometric properties with satisfactory construct validity and reliability (Seppala et al., 2009, Storm and Rothmann, 2003), across multiple professions and occupations (Nerstad et al., 2010, Palmer et al., 2010), in many international settings (Schaufeli et al., 2006). It has also been recognised as the most established and widely accepted definition and

Table 1
Descriptive breakdown of participants.

	Productive Ward group	%	Control group	%	Total	%
No. surveyed	253	100%	249	100%	502	100%
No. respondents	180	71%	158	63%	338	67.3%
Female	172	95%	145	93%	319	94.4%
Male	8	5%	13	7%	19	5.6%
^a Age						
18–24	6	3.4%	6	3.8%	12	3.6%
25–44	101	56.7%	93	58.9%	194	57.4%
45–65	71	39.9%	59	37.3%	130	38.5%
Nurse managers	11	6%	18	11.5%	29	8.6%
Staff nurses	112	62%	111	70%	223	66%
Clerical/admin	9	5%	3	2%	12	3.5%
Healthcare support	45	25%	24	15%	69	20.4%
Household	3	2%	2	1.5%	5	1.5%

^a Only 336 Ages returned/reported.

measure of work engagement in both the academic literature and nursing literature (Simpson, 2009a,b; Wong et al., 2010), recognising and measuring both cognitive and affective components (Freeneay and Tiernan, 2009).

2.7. Statistical analysis

Data were analysed using the commercial software SPSS (version 21). Frequency and descriptive statistics were generated for each of the variables contained in the questionnaire. Statistical analyses performed included:

- Standard reliability analysis of the questionnaire items, in order to confirm suitability of the UWES-17 scales in both a QI and Irish setting;
- Comparison of UWES scores (total work engagement score (WE) and individual constructs) in Productive Ward and control groups, using independent sample *t*-tests;
- Investigation of relationships between WE scores and other variables, using *t*-tests or contingency table analysis, as appropriate, and
- Analysis (using general linear models) of WE scores in Productive Ward and control groups, controlling for confounding variables identified in (c).

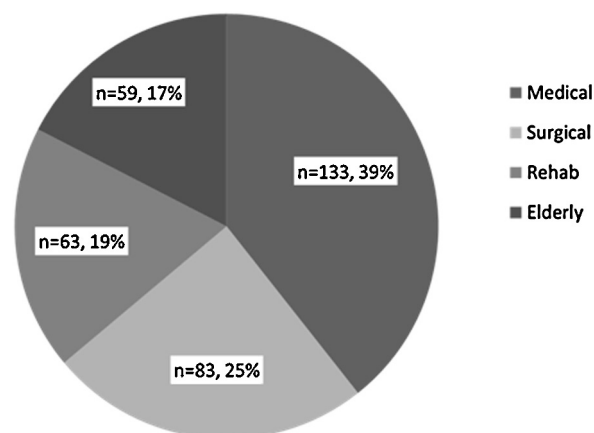


Fig. 1. Distribution of respondents by ward/unit clinical specialty.

2.8. Ethics

Ethics approval for participation in the study was sought and granted in each participating organisation. All participants agreed voluntarily to participate in the study after receiving detailed information and explanation of the research/evaluation aims and reassurances that the data would be anonymised and only used for research/evaluation purposes.

3. Results

The questionnaire was answered by a total of 338 team members (overall response rate of 67%). Response rates did not differ significantly ($p=0.07$) between the Productive Ward group ($n=180$, 53.6%), and the control group ($n=158$, 46.4%).

3.1. Reliability analysis of the UWES scale

A principal axis factor analysis was conducted on the 17 items with oblique rotation (direct oblimin). The Kaiser–Meyer–Olkin (KMO) measure verified the sampling adequacy for the analysis (KMO=0.93). Measures of eigenvalues confirmed acceptable values for three factors and concurs with other studies using the UWES (Schaufeli et al., 2006; Seppala et al., 2009; Storm and Rothmann, 2003). The overall 3-item measure of engagement in this sample had satisfactory internal reliability (Cronbach's alpha $\alpha=0.91$). The individual constructs, vigour (Cronbach's alpha $\alpha=0.77$), dedication (Cronbach's alpha $\alpha=0.83$) and absorption (Cronbach's alpha $\alpha=0.78$) also returned acceptable coefficients when compared to the accepted standard of $\alpha > 0.70$ (Bryman and Bell, 2011).

3.2. Comparison of WE scores in the Productive Ward and control groups

Respondents were asked to indicate their levels of engagement on the 17 items contained in the UWES. Analysis of total mean scores from the Productive Ward and the control group showed positively skewed levels of 'engagement' (both group means were >4). However, the

total mean 'engagement' (WE) score for the Productive Ward group was higher (4.34) than the control group (4.07). An independent *t*-test verified the statistical significance of WE scores at $p = 0.013$. Each of the three dimensions was examined and the WE mean scores remained significantly higher for the Productive Ward group when compared to the control group (see Table 2).

These significant results (for total WE score and its components) were all replicated using the non-parametric Mann–Whitney *U* test.

3.3. Relationship of WE scores and other variables

Of four study variables (gender, age, employment grade and clinical specialty area), just two were analysed in relation to WE scores. The sample was overwhelmingly female, so we omitted the gender variable from this part of the analysis. We omitted age also because (a) Productive Ward and control groups were similar with respect to age ($p = 0.88$, chi-square test for contingency tables) and (b) age was related to employment grade.

Using a multivariate general linear model, with WE score, and its three components, as dependent variables, and grade and specialty as between-subjects factors, we found highly significant effects of both these factors on all mean engagement scores (with the single exception that dedication score was not significantly related to employment grade).

3.4. Comparison of WE scores in Productive and control groups, controlling for effects of other variables

We added the group factor (Productive Ward, control) to the general linear model containing grade and clinical specialty area. Because of confounding variables (grade and clinical specialty area are related to WE score but also to group - Productive Ward/control), it is difficult to unravel the separate effects of grade, specialty and group on WE scores. However, *p*-values for the group factor in these models ranged from a significant $p = 0.015$ for the effect of group on dedication score, to a marginal $p = 0.062$ for the effect of group on total engagement score. In all cases, the WE scores were higher for the Productive Ward subjects than for the controls (see Table 3).

Table 2
Means, standard deviations, and *p* values.

Total sample <i>N</i> = 338			
	Productive Ward group	Control group mean	<i>p</i> value
<i>N</i> =	180	158	–
Total mean	4.34	4.076	0.013
SD±	0.87	1.06	
Vigour	4.03	3.73	0.012
SD±	0.99	1.2	
Absorption	4.22	3.90	0.015
SD±	1.06	1.18	
Dedication	4.68	4.29	0.002
SD±	0.96	1.25	

Table 3
Comparisons of WE mean scores by other variables.

Total sample <i>N</i> = 338			
		Productive Ward group	Control group
Clinical specialty of ward/unit	<i>N</i> =	180	158
	Medical	4.16	3.95
	SD±	0.99	1.29
	<i>N</i>	<i>n</i> = 60	<i>n</i> = 73
	Surgical	4.30	4.05
	SD±	0.92	0.73
	<i>N</i>	<i>n</i> = 46	<i>n</i> = 37
	Rehab	4.20	4.16
	SD±	0.80	0.81
	<i>N</i>	<i>n</i> = 33	<i>n</i> = 30
Employment grade	Elderly	4.75	4.486
	SD±	0.53	0.88
	<i>N</i>	<i>n</i> = 41	<i>n</i> = 18
	Nurse manager	4.94	4.30
	SD±	0.68	0.74
	<i>N</i>	<i>n</i> = 11	<i>n</i> = 18
	Staff nurse	4.18	4.02
	SD±	0.87	1.08
	<i>N</i>	<i>n</i> = 112	<i>n</i> = 111
	Clerical admin	4.90	5.10
SD±	0.95	0.33	
<i>N</i>	<i>n</i> = 9	<i>n</i> = 3	
Care assistant	4.49	4.00	
SD±	0.81	1.19	
<i>N</i>	<i>n</i> = 45	<i>n</i> = 24	
Household	4.29	4.60	
SD±	0.42	0.25	
<i>N</i>	<i>n</i> = 3	<i>n</i> = 2	

Two conclusions seem warranted, based on these results from the general linear model, and from examination of Fig. 2: firstly, clinical specialty area affects total WE score and, secondly, within each specialty, membership of the Productive group is associated with (modestly) higher WE scores.

Similarly, from the above results and from Fig. 3, we conclude that employment grade affects WE score, and that, within employment grade, WE scores are, mostly, higher in the Productive group than in the controls.

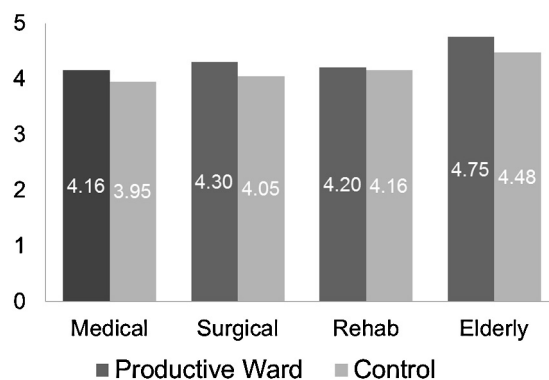


Fig. 2. UWES score by clinical specialty.

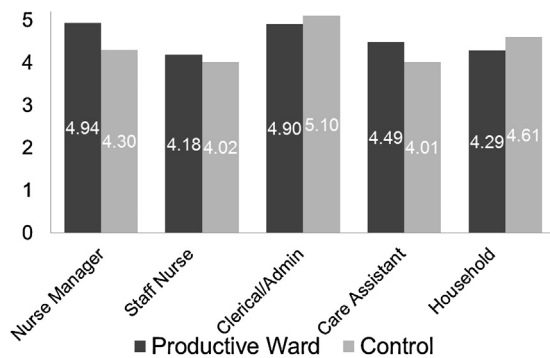


Fig. 3. UWES score by employment grade.

4. Discussion

Work Engagement is an important construct of happiness and well-being at work and has been strongly associated with employee turnover (Schaufeli and Bakker, 2004; Simpson, 2009b), business outcomes (Harter et al., 2002; MacLeod and Clarke, 2009), financial returns (Bakker et al., 2009), patient safety and mortality (Bargagliotti, 2012), and healthcare quality outcomes (Simpson, 2010, 2009a). Successful quality improvement efforts require both engaged employees and the associated impacts and innovations. Engaging and leading front-line clinical teams is an essential element of creating, developing and sustaining a culture of improvement (Brandrud et al., 2011; Graban, 2012).

Engagement as a key performance measure for QI initiative impact provides a novel, robust, humanistic perspective and could form one element of measure for a 'small test of change'. The findings and analysis of this national study confirm the appropriateness and stability of using the UWES for measuring work engagement in healthcare teams involved in QI implementation activities across a range of healthcare environments.

The purpose of this study was to explore the possible relationship and association of QI activities on work engagement. The findings of this national study demonstrate that quality improvement activities, like those associated with Productive Ward, appear to impact on the WE scores of the ward teams that participate. Higher mean WE scores were found across an array of acute and non-acute clinical settings involved in implementing the Productive Ward QI initiative. To our knowledge these quantitative findings of 'engagement' with QI activity have not been reported before.

The moderately higher mean WE scores from the non-nursing, clerical/administration and household (indirect care) team members in both Productive Ward and control groups was a surprising element of the findings. We believe that the differences may be due in-part to the higher-levels of stress and emotional demands experienced by 'front-line' healthcare occupations, like nursing (Adriaenssens et al., 2011; Aiken et al., 2002; Schaufeli and Janczur, 1994), which has been shown to make this group susceptible to 'burnout'. 'Burnout' has been well recognised and described as the antithesis or opposite-pole of

'engagement'. (González-Romá et al., 2006; Schaufeli and Bakker, 2004; Schaufeli et al., 2002) This could offer some explanation for the result of lower mean WE scores in front-line, clinical team members (nurses and healthcare support staff) when compared to the administration/clerical and household members of the ward team who generally provide indirect care.

Other recent studies have observed the impact of 'service climate', 'job characteristics/organisational variables' and 'ward leadership' on the work engagement of nursing staff within wards (Abdelhadi and Drach-Zahavy, 2012; Adriaenssens et al., 2011; Wong et al., 2010). However there is a paucity of literature examining the impact on the work engagement of multidisciplinary ward teams, especially during the implementation of initiatives like the Productive Ward which are specifically designed to improve the ward and clinical environment.

Although the sample size of the clerical/administration and household group is too small (total $n = 17$) to make any robust, detailed statistical analysis and conclusion, the higher WE scores amongst these grades within the control group requires further exploration. We believe that the answer may lie in the fact that QI activities, and in particular the Productive Ward initiative, challenge and redesign the many nursing processes and activity flows in the wards and departments where it is implemented. This will inevitably lead to nurses and care attendants 'shedding' non-value added activities and non-clinical tasks in an attempt to increase and improve 'time at the bedside'. The resulting non-value added activities and the non-clinical tasks that were shed must be 'picked-up' and performed by another element of the ward team. We hypothesise that this additional work burden in Productive Ward sites, is then allocated to the non-clinical members of the healthcare team resulting in them feeling less valued, 'less-engaged' or socially isolated in the QI process (Bartunek, 2011), thus manifesting in lower WE scores and becoming a possible, undesired consequence of the improvement intervention. These hypotheses require further exploration and will form the next stage of the national, on-going evaluation of this phase of Productive Ward implementation in Ireland.

Although the WE mean scores from 'clinical specialty' areas were found to have an effect, the elevated mean scores in the non-acute elderly care settings in both the Productive Ward and control group raises an interesting but not surprising finding. Organisation and team commitment to QI systems and processes in various hospital settings/sectors have been reported previously (Alexander et al., 2007), highlighting reduced patient turnover, profitability, organisational slack, care focus, activity pressures and person-centeredness as key enablers that support and nurture QI and QI activity in the non-acute sector. The provision of non-acute elderly care in Ireland has been heavily regulated and monitored in terms of standardised quality outcomes by the Health Information Quality Authority (HIQA) since 2006. This has resulted in a 'flurry' of QI initiatives in the non-acute elderly sector in Ireland, as healthcare teams strive to meet the patient-centred demands of both marketplace competition and statutory regulation. We feel that teams working within

this setting have therefore fully immersed themselves in a culture and environment of quality improvement, which, when coupled with a less stressful, less pressured non-acute environment, may manifest itself in higher WE scores in this group. This has been observed previously between higher stressed wards/departments within an acute setting (Adriaenssens et al., 2011). However this hypothesis between acute and non-acute settings requires further exploration and development.

The finding of higher mean WE scores amongst the nurse manager grades in the Productive Ward study group affirm the relationships, previously cited in other studies (The Kings Fund, 2012), that link QI efforts and Lean-type methods to leadership (Lucas and Buckley, 2009; Mann, 2009; Steed, 2012). The elevated WE scores in the Management grades observed in this study most certainly align with recent reviews of the Productive Ward literature, where the initiative is reported to nurture certain leadership traits (empowerment, advocacy, teamwork, motivation) in both project and ward managers who implement it (Davis and Adams, 2012; White et al., 2013; Wright and McSherry, 2013).

4.1. Limitations

One limitation of this study is the use of non-probability quota sampling for recruiting our control group. Whilst the characteristics of size and clinical context of the control group generally reflect that of the Productive Ward group, and are in essence a purposive sample, the matching exercise, no matter how rigorous could never be truly representative. Access to a randomised control group would of course be 'gold standard' for a QI study of this nature but realistically would be extremely challenging from a number of perspectives. We did, however, control (using general linear models) for variables, such as specialty and employment grade, which differed between intervention and control group, and which were also related to the WE outcome measures. Because of the study design, a second limitation of this study relates to generalisation. All findings in this study can only be viewed through the lens in which they were studied, teams involved in implementing the QI initiative Productive Ward in Ireland. However, the generalizability and transferability of learning from all QI initiatives requires careful assessment when trying to broaden, spread or replicate QI efforts as a result of the many organisational, contextual and social challenges involved (Langley and Denis, 2011; Ovretveit and Gustafson, 2002).

The possibility of positive report bias from respondents, who had received recent Productive Ward module training and then became actively engaged in a new exciting QI programme can also not be overlooked.

Although these limitations must be considered, the findings of this study do identify WE as of teams involved in QI. We anticipate a further 12-month follow-up survey and analysis, and we hope to identify, at that point, any possible bias related to QI workshops or training.

5. Conclusion

As many challenges to successfully implement and evaluate QI initiatives do exist, it is important to understand the role that QI programmes or interventions should play in the 'engagement' of the clinical ward-based teams who are generally charged with implementing. Likewise it is important to highlight the reciprocal value that 'engagement' brings to creating an improvement workforce (Berwick, 2003), that has a positive, fulfilling, innovative, work-related state of mind. Nothing ever happens in QI for one particular reason or cause (Ovretveit, 2011). It is usually a combination of many factors (mostly human) that influence implementation and the degree of success. The findings of this study are therefore timely in that they offer a different perspective and understanding of work engagement as one of the many conditions that influences improvement (and vice versa). Engagement is emerging as a key component of QI implementation (Dixon-Woods et al., 2012), particularly when trying to introduce or cultivate a culture of improvement (Berwick, 2008). This study indicates that QI programmes, like the Productive Ward, may positively impact on the 'engagement' (the vigour, absorption and dedication) of those ward team members who implement it.

Future use of this measure within QI implementation and QI research will determine its value and ability to accurately measure, reflect, and report the extent that nurses and ward-based teams contribute and positively participate in QI activities and help understand the factors that influence and engage them. There is little scientific evidence regarding the optimum levels of engagement required for optimal QI implementation, impact and sustained improvement. It may also assist senior nurse leaders and QI practitioners in adopting and adapting different training and communication strategies/policies/practices for engaging different grades of staff and different clinical specialty environments in QI activities. How work engagement interacts and interplays with the other key elements of QI work merits further investigation. We believe from our experience of Productive Ward implementation to date, that work engagement may also have a direct relationship with the level and the success of QI activities and the resulting innovations and improvements. We believe that QI activity and work engagement may have an inter-related dependency on each other and our intention is to carry out a longitudinal study that will examine that relationship.

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