***Patient experience of communication consistency among staff is related to nurse-physician teamwork in hospitals***

***Abstract***

**Aim**

To investigate if nurse reported teamwork with physicians was associated with patient perceived consistency in staff-to-patient communication.

**Design**

A cross-sectional survey design was used, drawing on data collected from two surveys in England.

**Methods**

Teamwork was assessed using data from the RN4CAST survey of 2990 nurses in 31 Trusts in England. Data on patient experience derived from the National Health Services Adult Inpatient Questionnaire, including 12506 patients in the same Trusts. A cross-sectional design with multivariate logistic regression was used.

**Results**

Each 5% increase in the proportion of nurses who agree that there “is a lot of teamwork between nurses and physicians” was associated with a 7% lower odds that patients reported inconsistency in communication among staff.

The results suggests that patients seem to experience the consequences of less teamwork between nurses and physicians through their own perceptions of inconsistency in communication between staff.

The findings emphasize good teamwork between doctors and nurses is not only important for the team, but can have consequences for patients. It provides additional incentive to find mechanisms to breakdown disciplinary barriers and improve the cohesion of clinical teams for the benefit of their patients.

**Key words:** patient experience, communication consistency, nurse-physician teamwork, RN4CAST, hospitals, England

## Introduction

The need for effective teamwork and improved communication among caregivers is increasingly recognized in healthcare policy worldwide (International, 2017; Manser, 2009; M. A. West & Lyubovnikova, 2013). As healthcare organisations navigate in highly complex contexts they are largely dependent on thorough collaboration and sharing of information between staff at all levels (M. A. West & Lyubovnikova, 2013). Promoting high quality teamwork based on effective and frequent communication is therefore essential for developing well-functioning healthcare organizations (Hughes, 2008; Tang, Zhou, Chan, & Liaw, 2018).

High quality teamwork and communication between staff have also been suggested as key factors to assure patient safety (Manser, 2009). Teamwork between nurses and physicians has long been identified as significant for nurse well-being and nurse-assessed quality of care (Rafferty, Ball, & Aiken, 2001). Nurse-physician collaboration has also shown to be a positive attribute of the work environment in so called magnet hospitals (Lake, 2007; Laschinger & Leiter, 2006), and during the last two decades an increasing body of research evidence has shown that quality of teamwork is important not only for staff well-being but also for patient outcomes (Lyubovnikova, West, Dawson, & Carter, 2015; Reason, 1995; E. West, 2001; M. A. West & Lyubovnikova, 2013). A recent study building on data from 62,733 respondents in 147 acute hospitals in the English National Health Service (NHS), Lyubovnikova et al (Lyubovnikova et al., 2015) showed that prevalence of high quality teamwork or real team membership (i.e. where teams build on shared objectives, structural interdependency, and regular reflective learning over work to keep track of the overarching objectives) was associated with patient outcome both on individual and organizational levels. Individual staff who reported real team membership witnessed fewer errors and incidents at their workplaces. Hospitals where a larger proportion of staff reported that they worked in real teams also had lower patient mortality rates (i.e. unexpected deaths) (Lyubovnikova et al., 2015).

One aspect of good teamwork is good communication between team members. This, in turn has potential benefits for patients. According to different studies between 22-65% of all severe adverse events are due to or involve communication failures between staff (De Meester, Verspuy, Monsieurs, & Van Bogaert, 2013; Manser, 2009; Martin, Ummenhofer, Manser, & Spirig, 2010; Rabøl et al., 2011). Other reported patient benefits of staff teamwork are fewer physician visits, reduced hospitalization rates, and greater satisfaction with care (M. A. West & Lyubovnikova, 2013).

Taken together, a large body of research indicate that hospitals with well-functioning teams that build on collaboration and communication between staff members seem to have better health outcomes for their patients. However, no study has yet explored what impact staff teamwork might have on patients’ perceptions of consistency in communication from staff. If communication between team members is a key aspect of a well-functioning team one consequence of its absence is that information is not shared and plans not agreed. This, in turn might directly impact patient experience.

The aim of this study was to investigate if nurse reported teamwork with physicians was associated to patient perceived consistency in staff-to-patient communication.

## Methods

A cross-sectional survey design was used, drawing on data collected from two surveys in England.

Teamwork between nurses and physicians was assessed using data from the RN4CAST survey of registered nurses (RN) undertaken in 2010 (Sermeus et al., 2011). In England the questionnaire was distributed to a representatively selected sample (based on size, geographic location and teaching status) of 31 Trusts (i.e. governing bodies that consist of conglomerates of hospitals). In each Trust a stratified random sample of maximum ten medical and surgical wards (five of each) were selected in each hospital. In total 7609 registered nurses in the 31 Trusts (covering 46 hospitals and 401 wards) were invited to take part in the study of which 2990 (39%) responded. The nurse response rate varied between the 31 Trusts from 19% to 69%. Nurses reported on the extent to which teamwork between nurses and doctors was present in their current job by responding to one item in the Practice Environment Scale of the Nursing Work Index (PES-NWI) instrument (Lake, 2002 ; Li et al., 2007) specifically addressing nurse-physician teamwork.

Data on patient experience was collected from the 2010 National Health Services Adult Inpatient Questionnaire (Care Quality Commission, 2011). It was distributed to 136,460 patients from all 161 acute and specialist Trusts in England. The response rate was 49 percent. The patients, discharged between June and August 2010, were chosen through purposive selection where each Trust identified a list of a maximum of 850 consequently discharged patients. This study builds on answers from the 12506 patients who were in the same 31 Trusts as the English RN4CAST survey.

### Ethical approval

The overall RN4CAST project obtained ethical approval from the ethics committee at Katholieke Universiteit Leuven in Belgium (Ref: B3222009 6682), since the project was the coordinating by the researcher from Leuven. Ethical approval to undertake the study in England was provided by the National Research Ethics Service (NHS REC ref 09/H0808/69).

Data from the Adult Inpatient Questionnaire is handled in accordance with the standards specified in the Microdata Handling and Security: Guide to Good Practice (https://data-archive.ac.uk/media/132701/UKDA171-SS-MicrodataHandling.pdf).

### Variables

***Explanatory variables***

In the RN-survey participants were asked to grade if they agreed to a number of statements related to their work environment. One of these statements directly addressed the issue of teamwork: “A lot of team work between nurses and physicians”. The response in the survey where given on a 4-point Likert scale ranging from 1=strongly disagree to 4=strongly agree. The variable was dichotomized into the positive responses (3 = somewhat agree and 4= strongly agree) versus negative response (1= strongly disagree and 2= somewhat disagree) (see table 1). Since the analysis was made on Trust-level we calculated the proportion of nurses reporting a positive response.

From the patient experiences survey we selected the question: “Sometimes in a hospital, a member of staff will say one thing and another will say something quite different. Did this happen to you?” The answers where given in three alternatives: “yes, often”, “yes, sometimes” and “no”. The measure was dichotomized as either patients agreeing to the statement (“yes, often”/”yes, sometimes”) or disagreeing (“no”).

#### Control variables

Four variables were selected as control variables. For the nurses, gender (proportion female) and work experience as a nurse (mean number of years) was used. Using nurses’ age as control variable was considered but excluded due to a high correlation between age and work experience. In the patient experience data gender and age (66 or older) were controlled for.

## Statistical methods

Descriptive statistics, cross-tabulations, frequencies, and graphs depicting distributions and correlations were used to check for anomalies, such as outliers or extreme values.

We used adjusted multivariate logistic regression models to estimate the relationship of RN-assessed teamwork and patients’ experience of mixed messages from staff. A mixed model was used to correct for the dependency of observations within Trusts. Confidence intervals (CI) were set at 95%. Data were analysed using SAS 9.4.

## Results

The 31 Trusts included in these analyses consist of 46 hospitals. The respondents consist of 12260 patients and 2919 nurses (71 of the nurses were not included due to missing data on the relevant variables). The mean age of nurses by Trust ranged between 34 and 46 years, and the proportion of women varied between 78% and 99%. The average work experience in years on Trust level varied between a minimum of 8 and a maximum of 19. The range of older patients (66+) by Trust was 39% to 62% and the proportion of female patients varied between 46% and 62%.

77% of the nurses responded that they somewhat or strongly agreed to the statement that there was a lot of teamwork between nurses and physicians at their current workplace, ranging by Trust between 66% and 90%.

A little more than one third (36%) of the patients responded that they had sometimes or often experienced that a member of staff said one thing and that another said something quite different. The proportion ranged by Trust between 30% and 48% (Table 1).

\*\*\* Table 1 about here \*\*\*

The results of the unadjusted and adjusted model of Trust level nurse assessments of teamwork between nurses and physicians and their relationship with patient perceptions of inconsistent communication from staff are presented in table 2. Gender of nurses and patients as well as patient age were significantly associated with the proportion of patients who perceived inconsistent communication from staff. Years of work experience amongst nursing staff was not significantly related to patient perception of communication.

In the adjusted model each 5% increase in the proportion of nurses who agree to the statement that there “is a lot of teamwork between nurses and physicians” is associated with a 7% lower odds that the patients experience inconsistency in communication among staff.

\*\*\* Table 2 about here \*\*\*

## Discussion

There is considerable variation between Trusts in the extent that teamwork is reported by nurses and that inconsistent communication is reported by patients. After controlling for other factors, variation in nurse reported team work is found to be significantly (associated with patient experience of inconsistent communication; a five percent increase in the proportion of nurses reporting good teamwork between nurses and physicians is associated with a seven percent decrease in the odds of patients getting inconsistent information from staff. This finding establishes a link between staff teamwork and consistency in communication to patients.

Both from an organizational and patient perspective this finding has clinical relevance, given that the proportion of nurses reporting poor teamwork varies from 10-34 percent. That we can see such an effect at the Trust level could be seen as surprising, given that NHS Trust is the highest organizational level comprising a large number of different organizational settings, so differences at hospitals and ward level are masked. Another finding is that a measure of patient experience not only provides an indication of care quality, as shown by Aiken et al 2012 (Aiken et al., 2012), but also provides an indicator of teamwork.

Our findings support the findings in other studies that quality of teamwork has consequences for patients (Lyubovnikova et al., 2015; Reason, 1995; E. West, 2001; M. A. West & Lyubovnikova, 2013). What this study adds is that inconsistency in communication from staff to patients might be a consequence of lack of teamwork. This may put patients at risk since other studies have found that conflicting information to the patient have effect on patient safety (Manser, 2009). Inconsistent communication to patients may potentially also erode patient confidence for healthcare staff and, in the long run, potentially for the healthcare system at large.

Our study has limitations. Patients were asked about consistency in communication between staff in general and not nurses and doctors specifically. However, nurses and physicians represent the two largest categories of staff interacting with patients (Page, 2004). Furthermore, even in cases where nurses might have been the ones given conflicting information to the patient we would argue that good teamwork between nurses and physicians probably are rare unless there is satisfactory collaboration among the group of nurses at the work place. The fact that the specific link between the nurses answering the survey and patients responding is unknown, beyond the fact that nurses worked on wards in the hospital where the patients spent their inpatient stay, can be considered as a limitation. However, a large and significant body of work including (for example) Aiken et al’s seminal paper in the Lancet (Aiken et al., 2014) on the association between hospital ward staffing levels and mortality uses similar methodology. Because of this loose linkage it is possible that the association we observe is may be an under or over estimate of the true relationship.

Another limitation is that the concept teamwork was not defined in the questionnaire. Therefore we cannot say anything about type and quality of teamwork the nurses referred to. West and colleagues have emphasized the need for a clear differentiation between actual work in what they call “real teams” and “pseudo teams” (Lyubovnikova et al., 2015; M. A. West & Lyubovnikova, 2013). Given the data used in this study we do not know to what extent the nurses referred to real teams or pseudo teams in their answers. We can only state that there is a significant correlation between what nurses perceive as a team and patients perceptions of consistency in information from staff.

Further studies are needed to explore potential impact of differences in type of teams.

The main result was not affected by gender, age, or experience among the nurses. Given the small number of observations (e.g. Trusts) the possibility of controlling for more items in the model was limited. Therefore we cannot exclude the possibility that other intermediate factors might have affected the result.

While this remains a cross-sectional study with inherent limitations in inferring cause, a key strength of this study is that we are not correlating variables within a single survey and so common method bias cannot account for our findings. The data used here are collected in 2010 can be considered as old, however, while levels of the reported variables may well have changed over time it seems less likely that the relationship would. And even though the data used are from 2010, it is still the only comprehensive data available on nurse perceptions and patient experience covering several Trusts in England (Aiken et al., 2018).

## Conlusions

What this study adds is showing a relationship that indicates that teamwork have consequences for the patients even when measured at high organizational levels in healthcare systems. Patients actually appear to be experiencing the consequences of less team work through their own perceptions of inconsistency in communication between staff.

## Implications for nursing management

The findings emphasize the importance of good team work between doctors and nurses. It provides additional incentive to find mechanisms to breakdown disciplinary barriers and improve the cohesion of clinical teams for the benefit of their patients.

## References

Aiken, L. H., Sermeus, W., Van den Heede, K., Sloane, D., Busse, R., McKee, M., . . . Kutney-Lee, A. (2012). Patient safety, satisfaction, and quality of hospital care: cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. *BMJ, 344*. doi:10.1136/bmj.e1717

Aiken, L. H., Sloane, D., Ball, J., Bruyneel, L., Rafferty, A. M., & Griffiths, P. (2018). Patient satisfaction with hospital care and nurses in England: an observational study. *BMJ Open, 8*(1). doi:10.1136/bmjopen-2017-019189

Aiken, L. H., Sloane, D., Bruyneel, L., Van den Heede, K., Griffiths, P., Busse, R., . . . RN4CAST consortium. (2014). Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study. *Lancet, 24*(383), 9931. doi:10.1016/S0140-6736(13)62631-8

Care Quality Commission, P. I. E. (2011). Acute Trusts: Adult Inpatients Survey, 2010. [data collection] (Publication no. <http://doi.org/10.5255/UKDA-SN-6821-1>). from UK Data Service. SN: 6821

De Meester, K., Verspuy, M., Monsieurs, K. G., & Van Bogaert, P. (2013). SBAR improves nurse–physician communication and reduces unexpected death: A pre and post intervention study. *Resuscitation, 84*(9), 1192-1196. doi:<https://doi.org/10.1016/j.resuscitation.2013.03.016>

Hughes, R. G. (2008). Nurses at the ‘‘sharp end’’ of patient care. In R. G. Hughes (Ed.), *Patient Safety and Quality: An Evidence-based Handbook for Nurses*. Rockville, MD: Agency for Healthcare Research and Quality.

International, J. C. (2017). International Patient Safety Goals (IPSG). In J. C. International (Ed.), Accreditation Standards for Hospitals (6th Ed ed.). Illinois USA: Joint Commission International. Retrieved from <https://www.jointcommissioninternational.org/assets/3/7/JCI_Hosp_Standards_6th_STANDARDS_ONLY_14Jan2018.pdf>.

Lake, E. (2002 ). Development of the practice environment scale of the Nursing Work Index. *Res Nurs Health, 25*(3), 176-188.

Lake, E. (2007). The nursing practice environment: measurement and evidence. Medical care research and review : MCRR 64 (2 Suppl), 104S-122S. *Medical care research and review, 64 (2 Suppl)*, 104S-122S.

Laschinger, H. K., & Leiter, M. P. (2006). The impact of nursing work environments on patient safety outcomes: The mediating role of burnout/engagement. *The Journal of Nursing Administration, 36*(5), 259-267.

Li, Y. F., Lake, E., Sales, A. E., Sharp, N. D., Greiner, G. T., Lowy, E., . . . Sochalski, J. A. (2007). Measuring nurses' practice environments with the revised nursing work index: evidence from registered nurses in the Veterans Health Administration. *Res Nurs Health, 30*(1), 31-44.

Lyubovnikova, J., West, M. A., Dawson, J. F., & Carter, M. R. (2015). 24-Karat or fool’s gold? Consequences of real team and co-acting group membership in healthcare organizations. *European Journal of Work and Organizational Psychology, 24*(6), 929-950. doi:10.1080/1359432X.2014.992421

Manser, T. (2009). Teamwork and patient safety in dynamic domains of healthcare: a review of the literature. *Acta Anaesthesiologica Scandinavica, 53*, 143-151.

Martin, J. S., Ummenhofer, W., Manser, T., & Spirig, R. (2010). Interprofessional collaboration among nurses and physicians: making a difference in patient outcome. *Swiss Med Wkly*.

Page, A. (2004). *Keeping patients safe: transforming the work environment of nurses*

Washington, DC: National Academies Press.

Rabøl, L. I., Andersen, M. L., Østergaard, D., Bjørn, B., Lilja, B., & Mogensen, T. (2011). Descriptions of verbal communication errors between staff. An analysis of 84 root cause analysis-reports from Danish hospitals. *BMJ Quality &amp; Safety, 20*(3), 268-274. doi:10.1136/bmjqs.2010.040238

Rafferty, A. M., Ball, L., & Aiken, L. H. (2001). Are teamwork and professional autonomy compatible, and do they result in improved hospital care? *Quality in Health Care, 10 (Suppl II)*, ii32-ii37.

Reason, J. (1995). Understanding adverse events: human factors. *Quality in Health Care, 4*(2), 80-89.

Sermeus, W., Aiken, L. H., Van den Heede, K., Rafferty, A. M., Griffiths, P., Moreno-Casbas, M. T., . . . Zikos, D. (2011). Nurse forecasting in Europe (RN4CAST): Rationale, design and methodology. *BMC Nursing, 10*(1), 6. doi:10.1186/1472-6955-10-6

Tang, C., Zhou, W., Chan, S., & Liaw, S. (2018). Interprofessional collaboration between junior doctors and nurses in the general ward setting: A qualitative exploratory study. *Journal of Nursing Management, 26*(1), 11-18. doi:doi:10.1111/jonm.12503

West, E. (2001). Management matters: the link between hospital organisation and quality of patient care. *Quality in Health Care, 10*, 40-48.

West, M. A., & Lyubovnikova, J. (2013). Illusions of team working in health care. *J Health Organ Manag, 27*(1), 134-142. doi:10.1108/14777261311311843

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| --- | --- | --- | --- |
| Table 1. Responses patterns of patient and nurses at Trust level | | |  |
|  |  |  |  |
|  | Overall proportion in percent | Lowest proportion on Trust level in percent | Highest proportion on Trust level in percent |
|  |  |  |  |
| ***Responses of Patients (in Trust)****: Sometimes in a hospital, a member of staff will say one thing and another will say something quite different. Did this happen to you?* |  |  |  |
| Yes, often /Yes, sometimes | 36% | 30% | 48% |
| No | 64% | 52% | 70% |
|  |  |  |  |
|  |  |  |  |
| ***Responses of Nurses (in Trust):*** *Please indicate the extent to which you agree that each of the following features is present in your current job. A lot of team work between nurses and physicians.* |  |  |  |
| Somewhat Agree / Strongly Agree | 77% | 66% | 90% |
| Strongly Disagree / Somewhat Disagree | 23% | 10% | 34% |
|  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 2. Effect of nurses experience of team work on patients perceived inconsistency in communication among staff | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  | Bivariate analyses | |  |  | Multivariate analysis1 | |  |
|  | Odds ratio | 95%CI  (Low, High) | Pr > |t| |  | Odds ratio | 95%CI  (Low, High) | Pr > |t| |
|  |  |  |  |  |  |  |  |
| Nurses agreeing in the statement "A lot of team work between nurses and physicians" | 0.986 | (0.977, 0.995) | 0.0017 |  | 0.985 | (0.977, 0.994) | 0.0011 |
| Nurses mean years of work experience | 1.022 | (0.997, 1.047) | 0.0893 |  | 1.020 | (0.998, 1.043) | 0.0777 |
| Gender of nurses (proportion of female nurses) | 0.375 | (0.112, 1.253) | 0.1112 |  | 0.294 | (0.104, 0.833) | 0.0212 |
| Age of patients (66> years) | 0.607 | (0.563, 0.654) | <0.0001 |  | 0.619 | (0.575, 0.668) | <0.0001 |
| Gender of patients (female) | 1.311 | (1.217, 1.413) | <0.0001 |  | 1.265 | (1.173, 1.364) | <0.0001 |
|  |  |  |  |  |  |  |  |
| *Error variance* |  |  |  |  |  |  |  |
| Level-2 Intercept “Trust” |  |  |  |  | 0.0081 |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Odds ratio of a 5% increase of the proportion of nurses agreeing on the statement "A lot of team work between nurses and physicians" | 0.932 | (0.890, 0.975) | 0.0017 |  | 0.927 | (0.890, 970) | 0.0011 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| 1 adjusted for patients age 66 years >, gender for patients, years of experience for nurses, gender for nurses | | |  |  |  |  |  |