Communication in the ICU and the Relation with Quality of Care and Patient Safety from a Nurse Perspective

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Abstract
Communication among healthcare providers is one of the most important factors associated with quality of care and patient safety, especially in Intensive Care Units (ICUs). However, relatively little is known about the different aspects of communication in healthcare, specifically in ICUs, and the relationship between communication and outcome measures. In this paper we adapted an existing questionnaire developed by Shortell et al. (1991) to further examine communication in ICUs from the viewpoint of nurses.

Keywords: Health care, Quality of care, Patient safety, Communication, ICU

1. Introduction

The literature shows that direct communication (face-to-face communication or real time communication) is the preferred mode of communication in Intensive Care Units (ICUs) (Moss, Xiao, & Zubaidah, 2002). However, because work in the ICUs can be fragmented and frequently interrupted, direct communication may not be optimal, therefore leading to communication breakdowns and possibly medical errors (Coiera, Jayasuriya, Hardy, Bannan, & Thorpe, 2002; Schoop, 1999). According to The Joint Commission, (The Joint Commission (TJC), 2007), two-thirds of the root causes of sentinel events in the period 1995-2005 were communication-related. A sentinel event is defined by the TJC as any unanticipated event in a healthcare setting resulting in death or serious physical or psychological injury to a person or persons, not related to the natural course of the patient's illness. Relatively little is known about the relationship between communication and patient safety, in particular in ICUs. We know that communication is related to patient safety and medical errors (e.g. TJC, 2007), but we know little about which aspects of
communication are important. In a study of the different aspects of communication in ICUs, Shortell et al. (1991) developed and tested a model (see Figure 1) to describe the relation between managerial practices and organizational processes related to effective performance, i.e. quality and efficiency of care provided to patients. They hypothesized that: “a team-oriented, achievement oriented culture and leaders who set high standards and provide necessary support provide more open, accurate, and timely communication, effective coordination with other units, and more open collaborative problems solving approaches. These, aspects, in turn, produce greater cohesiveness among team members resulting in the delivery of more effective patient care” (Shortell, Rousseau, Gillies, Devers, & Simons, 1991, p. 710).

In this study we examine the core of Shortell et al.’s (1991) model and explore the relationship between communication openness, accuracy, timelines and within and between group shift communication on the one hand and quality of care on the other hand. Communication openness involves the extent to which nurses, physicians and pharmacists are able to say what they mean when speaking with each other without fear of repercussions or misunderstanding. Communication accuracy refers to the degree to which nurses, physicians and pharmacists believe in the accuracy of the information conveyed to them by the other party (Roberts & O'Reilly, 1974). Communication timeliness refers to the degree to which patient information is related promptly to the people who need the information. Within and between group shift communication refers to the effectiveness of nurse/physician communication across shifts (Shortell, Rousseau, Gillies, Devers, & Simons, 1991). Results of the study by Shortell et al. (1991) showed that within- and
between-group openness, within- and between-group accuracy, timeliness and shift communication are all positively associated with quality of care and negatively with turnover intention of nurses.

In a study of healthcare providers in outpatient surgery centers, Carayon et al. (2005) confirmed the reliability and validity of three of the communication concepts (openness, accuracy and timeliness) developed by Shortell et al (1991). Carayon et al (2005) also examined the relationships between these different aspects of communication on the one hand, and unit effectiveness, satisfaction with care provided, job satisfaction, fatigue and tension on the other hand. Results showed that openness, accuracy and timeliness were significantly associated with unit effectiveness, satisfaction with care provided, and job satisfaction. Communication openness was also significantly (negatively) correlated with fatigue and tension (Carayon et al., 2005).

In this study we use the same concepts (openness, accuracy and timeliness) and added two scales developed by Shortell et al. (1991) about shift communication. We adapted those scales to study various dimensions of communication from the perspective of different care providers (i.e. nurses, physicians and pharmacists). In this paper, we examine these aspects of communication from nurses’ perspective.

Although the communication concepts developed by Shortell et al (1991) have proven to be valid and reliable (Shortell et al., 1991; Carayon et al., 2005), relatively little is known about how the different aspects of communication relate to quality of care and patient safety in ICUs. In our study we use three outcome measures for patient care and safety: satisfaction with care provided (SCP), time pressure affecting patient safety (TPPS) and overall perception of patient safety (OPPS). OPPS is a measure that indicates patient safety problems. We hypothesize that:

1) Communication openness is positively related to satisfaction with care provided (SCP) and overall perception of patient safety (OPPS).
2) Communication accuracy is negatively related to the overall perception of patient safety (OPPS).
3) Communication timeliness is negatively related to time pressure affecting patient safety (TPPS) and OPPS.
4) Shift communication is positively related to SCP and negatively related to OPPS.

Note that we do not formulate specific hypotheses about possible differences in the relations between within communication (between nurses) and between communication (between nurses and physicians and nurses and pharmacists) and quality of care and patient safety.

2. Methods

2.1 Sample

One-hundred-seventy-nine nurses in four ICUs returned the survey questionnaire (response rate 93%). Most of the respondents are female (88%). Average age is 36 years.
Forty percent of the nurses have had some college or technical training; 47% graduated from college; 10% have had some graduate school; and 3% have a graduate degree. Most of them (98%) are Caucasian. Average tenure is nearly 12 years. On an average, the nurses work 41.5 hours a week, mostly in 12-hour shifts (74%); in 8 hour shifts (9%) or in a combination of both (17%). Nine percent of the nurses work during weekdays; 9% on weekends and 72% in a combination of both. Thirty-six percent of the nurses work day shifts; 4% evening shifts; 33% night shifts; and 27% in a combination of shifts. Twenty-nine percent of the nurses work in the Adult ICU; 27% in the Cardiac ICU; 14% in the Pediatric ICU; and 30% in the Neonatal ICU.

2.2 Questionnaire

2.2.1 Communication in the ICU

We created 9 scales based on the work of Shortell and Rousseau (1989; 1991) and used in previous research (Carayon et al, 2005; 2006). All scales consist of two items. The scales are: within-group communication openness ($\alpha = .75$); between group communication openness (nurses and physicians ($\alpha = .91$) and nurses and pharmacists ($\alpha = .93$)); within group communication accuracy ($\alpha = .84$); between group communication accuracy (nurses and physicians ($\alpha = .88$) and nurses and pharmacists ($\alpha = .91$)); communication timeliness ($\alpha = .66$); and within group shift/hand off communication between nurses ($\alpha = .74$); and between physicians ($\alpha = .84$). Results of a second order confirmatory factor analysis (CFA) showed adequate fit for the communication construct ($\chi^2 = 188.9$, $df = 124$, $p<0.001$, GFI=0.88, SRMR=.12 and RSMEA=0.05). A major cause of the less than optimal fit is the fact that most scales only consist of two items, causing Heywood cases.

2.2.2 Quality of care and patient safety

We used several outcome measures based on the literature and earlier work. The first concept, satisfaction with care provided (SCP) is measured with a single item, adapted from Bertram et al. (1990). The second concept, time pressure affects patient safety (TPPS), is measured with two items adapted from Singer et al. (2003) and Alvarado (2003). The third concept, overall perception of patient safety (OPPS), is also measured with two items, adapted from Sorra & Nieva (2004). OPPS is a measure which indicates safety problems. All quality of care and patient safety items have been used in previous studies by Carayon et al. (2006; 2005). The whole questionnaire was tested in a pilot study with 10 volunteers before questionnaire distribution.

3. Results

We used correlation and linear regression analyses to examine the relationship between the different aspects of communication and the three measures of quality of care and patient safety. Since the nine different aspects of communication are relatively highly correlated, we used method forward in linear regression analysis to determine which aspects of communication are most strongly associated with the measures of quality of care provided and patient safety. Tables 1 and 2 show the results.
Table 1 Correlations between communication and quality of care and patient safety

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<th>SCP</th>
<th>TPPS</th>
<th>OPPS</th>
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<tbody>
<tr>
<td>Within group communication openness (nurses) (WGCNNO)</td>
<td>.29**</td>
<td>.24**</td>
<td>-.29**</td>
</tr>
<tr>
<td>Between group communication openness (nurses and physicians) (BGCNPhyO)</td>
<td>.23**</td>
<td>.33**</td>
<td>-.31**</td>
</tr>
<tr>
<td>Between group communication openness (nurses and pharmacists) (BGCNphaO)</td>
<td>.10</td>
<td>.13</td>
<td>-.05</td>
</tr>
<tr>
<td>Within group communication accuracy (nurses) (WGCNA)</td>
<td>.21**</td>
<td>.29**</td>
<td>-.29**</td>
</tr>
<tr>
<td>Between group communication accuracy (nurses and physicians) (BGCNphyA)</td>
<td>.18*</td>
<td>.32**</td>
<td>-.30**</td>
</tr>
<tr>
<td>Between group communication accuracy (nurses and pharmacists) (BGCNphaA)</td>
<td>.05</td>
<td>.14</td>
<td>-.19*</td>
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<tr>
<td>Communication timeliness (CT)</td>
<td>.20**</td>
<td>.12*</td>
<td>-.25**</td>
</tr>
<tr>
<td>Within group shift communication (nurses) (WGCNS)</td>
<td>.28**</td>
<td>.25**</td>
<td>-.21**</td>
</tr>
<tr>
<td>Between group hand off communication (physicians) (BGCPhyS)</td>
<td>.19*</td>
<td>.15*</td>
<td>-.26**</td>
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** Correlation is significant at the 0.01 level, * Correlation is significant at the 0.05 level

Table 2 Linear regression analysis communication on quality of care and patient safety

<table>
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<tr>
<th>Significant predictors (Beta-coefficients)</th>
<th>SCP</th>
<th>TPPS</th>
<th>OPPS</th>
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<tr>
<td>WGCNNO (.23) CT (.18) BGCNPhyA (-.14)</td>
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<tr>
<td>BGCNPhyO (.28) BGCNPhyA (-.21) WGCNS (.14)</td>
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<tr>
<td>BGCNPhyO (-.29) BGCNPhyA (.26) CT (.20)</td>
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<th>Adjusted R²</th>
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<td></td>
<td>.15</td>
<td>.24</td>
<td>.19</td>
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4. Discussion

Results of our analyses show that the different measures are relatively reliable and valid. Since little is known about the direction of the different aspects of communication, we hypothesized that communication openness is positively related to satisfaction with care provided (SCP) and negatively with overall perception of patient safety (OPPS). Results from correlation and regression analyses confirm this hypothesis for within group communication openness and between (nurses and physicians) communication openness. Results show that communication openness is also related to time pressure affecting patient safety (TPPS). However, results do not show significant relations between nurses and pharmacists communication openness and the outcome variables. Our second hypothesis postulated that communication accuracy is negatively related to OPPS. Results of our analyses confirm the hypothesis. Within and between group communication accuracy is also related to SCP and TPPS. We could not confirm this hypothesis with regard to group communication accuracy between nurses and pharmacists. Our third hypothesis postulated that communication timeliness (CT) is positively related to TPPS and negatively to OPPS. We have to partly reject this hypothesis: CT is negatively related to OPPS but is not significantly related to TPPS. CT is also positively related to SCP. Our last hypothesis postulated that within and between group shift/hand off communication is
positively related to SCP and negatively to OPPS. Results from correlation analysis confirm the hypothesis. Shift communication is also positively related to TPPS. Results from regression analysis show that --compared to the other aspects of communication-- shift communication does not play an important role. Further, results of regression analysis shows that communication openness is most strongly related to the outcome measures. Within group communication among nurses shows the strongest relation with satisfaction with care provided and between (nurses and physicians) communication openness is most strongly related to time pressure affecting patient safety and overall perception of patient safety. Between (nurses and physicians) group communication accuracy is related to all three outcome measures. To summarize, most of our hypotheses are accepted with regard to communication among nurses and communication between nurses and physicians, but not between nurses and pharmacists. Only one hypothesis is partly rejected. However, most communication aspects are also related to outcomes not predicted in our hypotheses. More research is needed to further specify and test the hypotheses and the model.

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References