

ORIGINAL RESEARCH

The importance of multidisciplinary teamwork and team climate for relational coordination among teams delivering care to older patients

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Abstract

Aim. To identify predictors of relational coordination among professionals delivering care to older patients.

Background. Relational coordination is known to enhance quality of care in hospitals. The underlying mechanisms, however, remain poorly understood.

Design. This cross-sectional study was part of a larger evaluation study examining the opportunity to prevent loss of function in older patients due to hospitalization in the Netherlands.

Methods. This study was performed in spring 2010 among team members delivering care to older hospitalized patients (192 respondents; 44% response rate) in one hospital. Relational coordination was measured by the Relational Coordination survey; team climate by the Team Climate Inventory and questions were asked about participation in multidisciplinary team meetings and disciplines represented in these meetings. To account for the hierarchical structure, a multilevel analysis was performed.

Results. Correlation analysis revealed a positive relationship among being female, being a nurse and relational coordination; medical specialists showed a negative relationship. The number of disciplines represented during multidisciplinary team meetings and team climate were positively related with relational coordination. The multilevel analysis showed a positive relationship between the number of disciplines represented during multidisciplinary team meetings and team climate with relational coordination.

Conclusions. The enhancement of team climate and attendance of diverse professionals during multidisciplinary team meetings are expected to improve relational coordination. Furthermore, this study underscores the importance of enhancing relational coordination between medical specialists and other professionals.

Keywords: hospital care, multidisciplinary teamwork, nursing, older patients, relational coordination, team climate

Introduction

With the ageing population, healthcare professionals are increasingly dealing with older patients suffering from multiple chronic diseases, which have contributed to the complexity of many tasks performed during care delivery (Kodner & Kyriacou 2000). Patients with complex needs use more health services than the general population; receive care from different health professionals and in multiple settings. Their intense use of health services puts older adults at greater risk of receiving fragmented or poor-quality care (WHO Study Group 1996, Leichsenring 2004, Nolte & McKee 2008). Once admitted to hospital, older adults are at an increased risk for poor outcomes such as readmission, increased length of stay, functional decline, iatrogenic complications and nursing home placement (Palmer 1998, Forster *et al.* 2003). Given that 34–50% of hospitalized older adults have been found to experience functional decline (Inouye *et al.* 1993, Lau *et al.* 2007), it is likely that current health care is not meeting the needs of ill older patients. Complex needs ask for the coordination of health and social care with related services provided by multiple providers (Ouwens *et al.* 2005). In response to this complexity, relational coordination may be an effective approach.

Background

The theory of relational coordination argues that the effectiveness of coordination is determined by the quality of communication among professionals in a work process (measured by its frequency, timeliness, accuracy and focus on problem-solving) and the quality of their relationships, particularly the extent to which shared goals, shared knowledge and mutual respect are expressed (Gittell 2006). Relational coordination is defined as ‘a mutually, reinforcing process of interaction between communication and relationships carried out for task integration’ (Gittell 2002b, p. 301), it is a type of professional relationship that is particularly relevant for coordinating work that is highly interdependent, uncertain and time-constrained (Gittell *et al.* 2000).

The emphasis on relationships among roles, rather than on those among individual actors, is found in the management of flight departures, acute and emergency care, trauma units, nursing homes, hospital care and disease-management programs (Young *et al.* 1998, Gittell 2001, 2002a, Gittell *et al.* 2008, Havens *et al.* 2010, Cramm & Nieboer 2011, 2012). In nursing homes, relational coordination among professionals was positively associated with resident quality outcomes (Gittell *et al.* 2008). Relational coordination among medical specialists, nurses, physical therapists, social

workers and case managers predicted quality and efficiency outcomes for hospitalized patients (Gittell *et al.* 2009). In addition, it was shown that patient functioning was significantly improved by the frequency of communication, strength of shared goals and the degree of mutual respect between professionals (Gittell *et al.* 2000). As the provision of care to older adults is a complex undertaking that requires input and high levels of interdependency among professionals from various disciplines (Grol 2000), relational coordination among professionals has been shown to improve care delivery by enhancing the exchange of relevant information and by strengthening shared goals and the degree of mutual respect among diverse professionals.

Although there is evidence that relational coordination improves quality of care (Gittell *et al.* 2000, 2008, 2009, Cramm & Nieboer 2012), the underlying mechanisms that promote relational coordination among professionals delivering care to hospitalized older patients remain poorly understood. We do know that multidisciplinary teamwork is considered a core component of effective care delivery (Wagner *et al.* 1996, 2001, Ouwens *et al.* 2005), which may also enhance relational coordination among professionals. According to organization design theory, multidisciplinary team meetings are central for multidisciplinary teamwork. These meetings increase performance of interdependent work processes by facilitating interaction among professionals and are increasingly effective under conditions of high uncertainty (Galbraith 1974). Ideally, each team member knows the diverse perspectives of other team members and trusts others to deliver care that is appropriate to their respective background. As multidisciplinary team meetings have high information processing capability, they are expected to facilitate communication and coordination among professionals in a work process (Gittell 2006). We, therefore, expect that multidisciplinary team meetings may enhance relational coordination by providing the opportunity for frequent, timely, accurate and problem-solving behaviour to develop.

Previous research also showed that team climate was positively related to continuously delivering high quality care through professionals sharing objectives, commitment and support (Campbell *et al.* 2001, Bower *et al.* 2003). Team climate refers to professionals’ shared perceptions of the types of behaviours and actions that are rewarded and supported by the team policies, practices and procedures (Schneider 1990). When a team has a climate for teamwork, team members are willing to provide and share resources. In this way, a team climate that encourages social interaction draws the interpretations by professionals of events and objects closer together (Weick 1979, Schneider & Reichers 1983, Rentsch 1990, Klein *et al.* 2001,

Ford & Seers 2006). Consequently, professionals working in such teams freely coordinate and communicate with each other about their tasks and expertise (West & Anderson 1996). As coordination and communication between professionals is influenced by team climate, it is believed to increase relational coordination by enhancing the quality of underlying relationships, expressed by shared goals, shared knowledge and mutual respect.

Besides these team-level constructs, individual characteristics could also affect relational coordination. Cross and Madson (1997) showed in their review on gender differences that while women often describe themselves more in terms of relationships with others, men have a stronger tendency to describe themselves in terms of separateness of others. In addition, women tend to rate themselves more highly on interdependence, whereas men rate themselves higher on independency.

Given the focus on multidisciplinary teamwork, we also investigate relational coordination between professionals with different occupational backgrounds. Nurses play an active, central role in the provision of hospital care to older patients, which may result in differences in relational coordination between nurses and medical specialists.

Relational coordination among healthcare professionals in the hospital is expected to be a useful tool for professionals to reshape care delivery, so that it is more responsive to the needs and desires of older patients (Gittell *et al.* 2000, 2008, Gittell 2001, Weinberg *et al.* 2007). There is, however, a lack of research investigating the underlying mechanisms that promote relational coordination. Therefore, this study aims to investigate the relationship between individual characteristics, multidisciplinary team meetings, team climate and relational coordination among professionals delivering care to hospitalized older patients.

The study

Aim

To identify predictors of relational coordination by professionals delivering care to older patients.

Design

This cross-sectional study was based on a pilot study among professionals involved in the care for vulnerable older patients prior to implementation of the 'Prevention and Reactivation Care Program'. The 'Prevention and Reactivation Care Program' was designed to prevent loss of function in older patients due to hospitalization (Asmus-Szepesi *et al.*

2011). The results of the pilot study have been used to identify possible practical implementation problems in preparation for the main evaluation study. In the participating hospital, multidisciplinary team meetings were organized twice a week to discuss new older patients, develop individual treatment plans and evaluate the progress of patients. At least one medical specialist was present during these meetings, complemented by other professionals involved in the care delivery to older patients (e.g. nurse practitioner, social worker or transfer nurse) (De Vos *et al.* 2012).

Participants

The potential participants comprised 440 professionals involved in the delivery of care to older patients in one hospital in the Netherlands. These professionals consisted of medical specialists, nurses (registered according to the Dutch regulations for nursing practices) and paramedics (physiotherapists, speech therapists, dieticians and social workers). Most of the participants worked on the internal medicine ward (15%), cardiology (13%), neurology (9%), surgery (8%) and geriatrics (7%).

Data collection

Data were collected in 2010 using a questionnaire distributed to 440 professionals participating in the delivery of care to older patients at the hospital. The professionals returned the completed questionnaires in a return envelope. A gift voucher of 10 euro was given as a reward for their participation. A total of 192 professionals completed and returned the questionnaire (44% response rate), of which 48 medical specialists (out of 101; 48% response), 113 nurses (out of 306; 37% response) and 26 paramedics (out of 33; 79% response). All personal identifiers were removed or disguised, so the person(s) described are not identifiable and cannot be identified through the details of the story.

Instruments

In addition to demographic characteristics, participants were asked how often they participated in a multidisciplinary team meeting (response categories: never, once a month, once in 2 weeks, once a week or multiple times a week) and which occupational backgrounds were represented in these meetings.

Team climate

The Team Climate Inventory (TCI) was used to measure the professional's perceptions of team climate while

working in multidisciplinary teams delivering care to older patients. The questionnaire comprises four broad factors reflecting a team's shared perceptions of organizational policies, practices and procedures: shared vision and objectives (four items), participative safety (four items), task orientation (three items) and support for innovation (three items). Participants were asked to rate their agreement on the TCI-items on a 5-point scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree). Higher scores indicated a better or more desirable team climate (Anderson & West 1998, Kivimäki & Elovainio 1999).

Relational coordination

Relational coordination was measured using six survey questions on a four-point scale (1 = never, 2 = rarely, 3 = occasionally and 4 = all the time) including three questions about communication (frequency/timeliness, accuracy, problem-solving) and three questions about relationships (shared goals, shared knowledge, mutual respect). The relational coordination score was derived by calculating the mean of in total 6-item scores. Higher scores indicated better or more desirable relational coordination (Gittell *et al.* 2008, Cramm & Nieboer 2011, 2012). Pilot testing revealed that the items 'timely' and 'frequent' communication were not distinguishable for the professionals delivering care to hospitalized older patients, which led us to combine both aspects of relational coordination in a single question. Respondents were asked about communication and coordination with other professionals involved in delivering care to hospitalized older patients: medical specialists, nurses, physical therapists, dieticians, social workers, transfer nurses, case managers and family physicians.

Ethical considerations

All the necessary approvals were obtained from the participating organization. The study protocol was approved by the Medical Ethics Committee of the university responsible for performing this study.

Data analysis

We tested for influence of the team (level 2) on relation coordination. These results indicated that team level affects relational coordination ($-2 \log$ likelihood 495.829 vs. 472.324; $P = 0.01$). Therefore, to account for the hierarchical structure of the study design, we fitted a

hierarchical random-effects model. The hierarchical structure comprises 192 professionals nested in 25 teams. Individuals were excluded if any outcome observation was missing, leading to a total of 138 professionals in the multilevel regression analysis. The indicators of multidisciplinary team meetings and team climate were estimated with a two-model random-intercepts and fixed-slopes model structure. To estimate the strength of associations, explained variances were obtained. First, the estimates of the empty model are described (model 1), which reflect variation in the intercept. Second, the adjusted coefficients of the different independent variables are estimated (model 2). Data were analysed using the SPSS software package (ver. 18.0 for Windows; SPSS Inc., Chicago, IL, USA). A significance level of 0.05 was used for all statistical tests.

Validity and reliability

Both the TCI and Relational Coordination survey are validated and reliable measurement tools. Cronbach's alpha of the TCI in this study was 0.94 indicating excellent reliability. The questionnaire has been applied to examine the effect of teamwork on the quality of care delivery (Campbell *et al.* 2001, Bower *et al.* 2003). Cronbach's alpha of the Relational Coordination instrument in this study was 0.96, also indicating excellent reliability. The questionnaire has been applied in the hospital setting (Gittell *et al.* 2000, Havens *et al.* 2010).

Results

Table 1 displays the descriptive characteristics of the study sample. Of those who completed the questionnaire, the majority was female (76%) and worked as a nurse (64%) or medical specialist (27%). In the occupational groups, nurses were mostly female (87%), medical specialists were evenly divided (50% female) and paramedics were mostly male (35% female).

A large majority of the respondents (71%) has been working in the organization for a period longer than 5 year.

Multidisciplinary team meetings

The biweekly multidisciplinary team meetings were not attended by all professionals at all times. Most respondents participated in a multidisciplinary team meeting between once in 2 weeks and once a month. On average, professionals from five different occupational backgrounds attended these meetings.

Table 1 Descriptive statistics.

Demographic characteristics	Range	% or mean (SD)	<i>n</i>
Sex (female)		76%	187
Profession			
Medical specialist		27%	187
Nurse		64%	
Paramedic		9%	
Years working in the organization (>5 year)		71%	187
Frequency of MDTM	1–5	2.3 (1.4)	184
Number of disciplines participating in MDTM	0–12	4.1 (3.3)	184
Team climate	1–5	3.6 (0.7)	140
Relational coordination	1–4	2.6 (0.9)	164

MDTM, multidisciplinary team meeting.

Team climate and relational coordination

Mean overall team climate was 3.6 (SD 0.7; range 1–5) and relational coordination 2.4 (SD 0.9; range 1–4).

Non-response analysis

We performed a non-response analysis for the Relational Coordination instrument. Non-response was common for this comprehensive instrument, which was part of the last section of the questionnaire. Professionals who did not complete the Relational Coordination instrument participated significantly less in multidisciplinary team meetings (1.58; SD 1.10; once a month) compared with professionals who did complete the instrument (2.28; SD 1.41; once in 2 weeks). This may explain their loss of interest in completing the Relational Coordination survey. No differences were found in gender, occupation and team climate.

Associations with relational coordination

Correlation analysis revealed a positive relationship between being female and relational coordination ($r = 0.22$; $P = 0.005$). Nurses showed a positive relationship with relational coordination ($r = 0.40$; $P \leq 0.001$), while medical specialists showed a negative relationship ($r = -0.35$; $P \leq 0.001$). The frequency of multidisciplinary team meetings did not show an association with relational coordination. However, the number of disciplines represented during multidisciplinary team meetings had a positive relationship with relational coordination ($r = 0.36$; $P \leq 0.001$). In addition, team climate showed a positive relationship ($r = 0.22$; $P = 0.01$) with relational coordination (Table 2).

Table 3 shows the multilevel indicators for all examined factors. Relational coordination was positively influenced

by being a nurse ($P \leq 0.001$), the number of disciplines participating in a multidisciplinary team meeting ($P = 0.001$) and team climate ($P = 0.021$). In addition to the other factors, being female or paramedic had no significant relationship with relational coordination in the multilevel analysis.

Discussion

Our multilevel results indicated that the number of disciplines participating in multidisciplinary team meetings and team climate were contributors to the development of relational coordination. Multidisciplinary team meetings increase performance of interdependent work processes by facilitating interaction among professionals and are increasingly effective under conditions of high uncertainty (Galbraith 1974). Ideally, each team member knows the diverse points of view held by all other team members and trusts

Table 2 Associations with relational coordination.

	Relational coordination	<i>n</i>
Sex (female)	0.22**	164
Medical specialist	-0.35***	164
Nurse	0.40***	164
Paramedic	-0.05	164
Years working in the organization (>1 year)	-0.04	164
Frequency of MDTM	0.07	161
Number of disciplines participating in MDTM	0.36***	164
Team climate	0.22**	138

*** $P \leq 0.001$; ** $P \leq 0.01$ (two-tailed).

Table 3 Hierarchical multilevel analyses of relational coordination among professionals ($n = 138$).

Model	1		2	
	B	SE	B	SE
Constant	2.49***	0.10	2.74***	0.05
Sex (female)			0.05	0.05
Nurse			0.23***	0.06
Paramedic			0.04	0.05
Number of disciplines participating in MDTM			0.18***	0.05
Team climate			0.12*	0.05
-2 log likelihood	342.411		231.165	
Explained variance (individual level)			18.6%	
Explained variance (team level)			30.2%	

*** $P \leq 0.001$; * $P \leq 0.05$ (two-tailed); reference group medical specialists. Listwise deletion of missing cases.

others to deliver care that is appropriate to their respective background. As multidisciplinary team meetings have high information processing capability, they also facilitate interaction among professionals in a work process (Gittell 2006). In line with our results, Gittell (2002b) showed that team meetings improve performance by increasing the level of relational coordination among professionals. Our findings add to this current understanding of relational coordination that it is not so much the frequency of multidisciplinary team meetings that influences relational coordination, but particularly the number of disciplines represented. This is an important finding as the complex needs of older adults often ask for task reallocation and the use of new types of professionals (Wagner *et al.* 1996). In addition, we found that team climate enhances relational coordination. A positive team climate may have promoted coordination and communication among professionals delivering care to older patients by a more supportive and stimulating environment expressed by shared goals, shared knowledge and mutual respect.

Although workforce flexibility and multidisciplinary teamwork create an increasing interdependence between different types of professionals (Nancarrow & Borthwick 2005), this does not automatically lead to enhanced communication and coordination among professionals from different disciplines. The tension between medical specialists and nurses and the barriers to multidisciplinary teamwork, for example, have received considerable attention (Stein *et al.* 1990, Casey & Smith 1997). This study revealed a positive relationship between being a nurse and relational coordination, whereas medical specialists showed a negative relationship. Although medical specialists are dependent on other professionals in delivering care to older patients, medical specialists often independently prescribe, alter or manage interventions or treatments in accordance with their own specialized judgment (Daly & Carnwell 2003, Nancarrow & Borthwick 2005). Compared with other professionals, medical specialists more often make their treatment decisions independently of others, which may explain the negative relationship found between medical specialists and relational coordination. Nurses are, however, more dependent on coordination and communication with other professionals in performing their tasks, which may explain the positive relationship found between being a nurse and relational coordination. While it may not be less important for medical specialists to communicate and coordinate with professionals of other disciplines in their own care delivery, it is important for relational coordination among the whole team to deliver holistic integrated care to older patients (WHO Study Group 1996). This study underscores the

importance of enhancing relational coordination between medical specialists and other professionals delivering care to older patients.

Limitations of the study

There are limitations. First, the cross-sectional design allowed us to identify associations but not to determine causality. Longitudinal data would provide the opportunity to disentangle the dynamic relationships among multidisciplinary team meetings, team climate and relational coordination. Secondly, the response rate of 44% is slightly below the average response rate of about 50%, which is often found among professionals working in hospitals (Cummings *et al.* 2001). Thirdly, we were not able to control for all possible confounders such as personality traits. A confounding factor that may have influenced this research has to do with a more positive attitude of some professionals towards teamwork and coordination in general. Differences in coordination may in part reflect gender or personality differences, rather than differences in relational competence. For example, females are often described as more sensitive to social cues, resulting in more active cooperative behaviour (Croson & Gneezy 2009). One could reason that, as most participants were female, this may have had an impact on the development of relational coordination. To explore this opportunity, further research has to be performed. In addition, we were also not able to capture organizational dynamics. A confounding factor that may have influenced this research has to do with the organizational context (Nieboer & Strating 2012). Future research has to explore the effects of organizational factors such as competition between hospitals or changes in hospital funding on team work in organizations and its effect on relational coordination. Finally, although we examined the relationship between multidisciplinary team meetings, team climate and relational coordination among professionals delivering care to hospitalized older adults, further longitudinal research is necessary to assess the effects of relational coordination on improved patient experiences and outcomes.

Conclusion

As our population ages, healthcare professionals face the challenge of working with a variety of professionals to reshape care delivery, so that it is more responsive to the needs and desires of older patients (WHO Study Group 1996). Relational coordination among healthcare professionals in the hospital is expected to be a useful tool for the

What is already known about this topic

- Relational coordination has been shown to improve quality of care delivery by improving communication (measured by its frequency, timeliness, accuracy and focus on problem-solving) and coordination between professionals (shared goals, shared knowledge and mutual respect).
- Multidisciplinary team meetings facilitate interaction among professionals from various disciplines, which is expected to increase performance of interdependent work processes. When a team has a climate for teamwork, team members are willing to provide and share resources, which draw the interpretations by professionals of events and objects closer together.

What this paper adds

- Multidisciplinary team meetings positively affect the development of relational coordination and are not only the frequency of multidisciplinary team meetings per se but also the number of professionals represented that has a positive influence. A positive team climate enhances relational coordination by promoting coordination and communication among professionals in a supporting and stimulating environment.
- A positive relationship was found between being a nurse and relational coordination, whereas the relationship between medical specialists and relational coordination was negative.

Implications for practice and/or policy

- To promote relational coordination among professionals delivering care to hospitalized older patients, it is recommended that professionals from different occupational backgrounds are represented at multidisciplinary team meetings.
- Special attention should be given to promote relational coordination between medical specialists and other professionals.

achievement of this goal. The results of this study provide insight into the predictors of relational coordination.

The study results have important implications. Our findings support the importance of multidisciplinary team meetings and team climate in the development of relational coordination and suggest that it is not only the frequency of multidisciplinary team meetings *per se* but also the number of professionals represented that has a positive influence. The

coordinated response of activities and information that could result from relational coordination is believed to be an important feature of effective and efficient care delivery (Wagner *et al.* 1996, 2001, Batalden & Mohr 1997, Ouwens *et al.* 2005). Furthermore, this study underscores the importance of enhancing relational coordination between medical specialists and other professionals delivering care to older patients.

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Author contributions

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (http://www.icmje.org/ethical_1author.html)]:

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

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