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Is staff well-being and communication enhanced by multidisciplinary work shift evaluations?

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Abstract *Objective:* To study the implementation of multidisciplinary structured work shift evaluations at a pediatric intensive care unit (PICU) to enhance team communication. *Design and setting:* Prospective, repeated measurements design, comparison of pre/post measurements and process measures in a Dutch tertiary care, university-affiliated PICU. *Participants:* All 61 PICU staff members. *Interventions:* Implementing multidisciplinary structured work shift evaluations. Before the implementation phase the PICU team received feedback training and eight participants (four physicians, four nurses) were trained as "work shift evaluation leader." *Measurements and results:* Outcome measures covered: (a) quality and process of the implementation through prestructured checklists during the 3 months of implementation, (b) a subjective evaluation of a feedback training on team communication as anticipated action and on the level of communication (about patients and with colleagues), and (c) emotional exhaustion complaints and work-related fatigue. The interdisciplinary structured work shift evaluations were implemented successfully as planned during the work shift; all staff were trained ahead, and the process was followed almost completely. Almost two-thirds (62%) of the staff felt a positive influence on team communication. Almost all staff members (92%) were satisfied regarding communication with their colleagues after the intervention, compared to 76% before. Emotional exhaustion in the PICU team decreased significantly after the implementation, but no differences in work-related fatigue levels were found. *Conclusions:* As organizational change the implementation of a multidisciplinary structured work shift evaluation at a PICU was successful and team communication improved. Emotional exhaustion decreased during the study period.

Keywords Team communication · Team work · Implementation · Work shift evaluation · Work-stress · Pediatric intensive care unit

Introduction

A critical care crisis has emerged because general and pediatric intensive care units (PICUs) worldwide have difficulty recruiting staff and retaining experienced nurses. The critical care professional societies have called for federal action because demands on critical care services will soon exceed available facilities, and because of an existing but largely unrecognized shortage of physician intensivists [1]. Shortage of staff and employee absen-

teeism will increase the working staff's workload and intensify feelings of restlessness among them.

PICUs are characterized by high professionalism and by emotional demands that are higher than those in general hospital departments [2]. The emotional experiences of PICU staff members may be of critical incident intensity, but the frequency of minor emotional experiences (known as daily hassles) is much higher and has found been to be correlated to the level of emotional complaints in the staff (e.g. [3]). The source of these daily hassles can be found in the interaction among staff members themselves or between the staff and the patients' parents or relatives. These hassles result in repeated (minor) stress reactions, which accumulate during a shift (e.g. [4, 5, 6]). These accumulated stress reactions adversely affect the well-being, mood, and work-related fatigue levels of staff members during work. Their effect can also continue in the home environment over the short term. Over the long term they can give rise to such health problems as burnout and chronic stress syndrome [5, 7]. At the organizational level the effects may be higher employee sickness rates, frequent (short) spells of absenteeism, and voluntary job turnover.

The work at PICUs leads to psychological stress reactions among the staff, as has been confirmed by numerous neuroendocrine parameters [8, 9]. Psychological stress reactions of the nurses have been associated with several communicative aspects in the work environment, such as unresponsiveness, lack of support, lack of feedback, poor communication at work, and conflicts [10]. These communication problems can occur between colleagues in the same or different disciplines or with supervisors. The most commonly cited source of intrateam conflicts at a PICU (physician-physician, physician-nurse) is poor communication [2]. Interestingly, only 6% of physician-nurse conflicts are defined as a conflict by both disciplines. This difference in perceptions naturally hinders conflict resolution. Burns and Harm [11] found a remarkable discrepancy between the reports of nurses and those of physicians about team discussions of the ethical issues involved in end-of-life care at the PICU; almost all physicians (92%) reported that these issues were discussed in the team, as opposed to only 59% of nurses [11].

Cudmore's [12] study on nurses in an accident and emergency unit found that work shift evaluation was felt to be valuable in improving the work and beneficial to the staff's mental health. However, this study did not explore options in the organization for introducing formal evaluation moments in structured sessions. Since communication-related hassles are prevalent both within and between professions, evaluations of daily emotional experiences should take place at the team level and include all staff members.

Patient satisfaction may be as important as staff satisfaction. A recent study found that twice as many departments whose staff felt they received good administrative support and reported good relations between physicians and nurses, had high patient satisfaction [13]. Good relations between disciplines enhances teamwork. Staff members differ in their professional backgrounds (nurses, physicians, assistants) and also in their definitions of emotional "incidents" [2] and their coping mechanisms. Generally, however, most team members are presumed to experience the same exposure to daily hassles and emotional incidents over time. A qualitatively better psychosocial working environment may prevent or buffer the negative effects of daily hassles, improve job satisfaction, and reduce health-related problems such as burnout [14]. In the longer term a better work organization can also help reduce staff absenteeism and turnover. These aspects of intensive care unit organization has not been the subject of recent study [15].

We decided to try to enhance team communication and thereby create an "emotional pressure valve" during working hours with a view to stimulating recovery from work and decreasing the persistence of unnecessary worries and accompanying bodily stress reactions after working time. This study's aim was to implement multidisciplinary structured work shift evaluations at a PICU and study the quality and process of implementation. In addition, subjective experiences about team communication and stress-related health reactions were monitored.

Materials and methods

Content of the intervention

On two predetermined days per week the last 30 min of the day shift was planned only for the multidisciplinary structured work shift evaluation at the department. All staff members working on that shift gathered and together evaluate how well the working day went, and what had happened during work at the department. During these 30 min the evaluation leader structured the process, ensured the proper time span, guided the type of interactions between team members (creating safe environment for feedback), and organized the communication (about emotional events, teamwork, work roles, organizational aspects) in predefined models of communication. The predefined communication models that should be used, were: (a) a star model (the group discussion goes through the leader by having mini-talks about one subject with all members one-to-one, summarizing every mini-talk, and then ask for a group reply or move over to the next group member), (b) a cobweb model (after introducing a subject the leader "backs off" for a while by giving group members the opportunity to react freely and unorganized to each other, and reorganizes the discussion after a while by summarizing and moving on to the next subject), and (c) a sharing model (combining the star model and the cobweb model).

Two training courses were conducted to prepare for the implementation phase of the multidisciplinary structured work shift evaluation: (a) a 1-day feedback training course given to all staff to enhance their interpersonal communication skills and (b) a 2-day course to train eight selected staff members (four physicians, four nurses) to supervise the structured multidisciplinary work shift evaluation. Instruction in all training sessions was provided by a professional communication trainer (M.C.) and her colleagues from the Department of Medical Psychology at the same organization.

Design and study sample

A prospective repeated measurement design was used. The subjects consisted of 61 staff members (physicians, nurses, department assistants) at a tertiary PICU in a university-affiliated medical center in The Netherlands. Each subject was studied at baseline and after intervention using self-report questionnaires. After verbal information sessions with all staff members the first questionnaire (t_1) was sent to the home addresses in September 2001, followed by a reminder 2 weeks later (response rate 82%). Six months after implementing the structured multidisciplinary shift evaluation this procedure was repeated and a second questionnaire (t_2) was sent to all t_1 responders still employed at the department, 72% of whom responded in June 2003. Retrospectively, 28% of the total baseline cohort voluntarily took jobs at other hospitals or quit working during the study period. Due to this turnover rate the prospective cohort theoretically decreased from 61 to 48. The final response over the two measurements was therefore 55%. The responders were 41±7.4 years old and had worked an average of 11±7.1 years in their present job.

Nonresponse analysis

Nonresponse analyses were performed by comparing staff members from the baseline cohort who did not complete in the t_2 questionnaire on relevant study variables with the baseline cohort staff who did participate in the t_2 measurement. No changes between the two groups were found with respect to age, perceived psychosocial aspects of the working environment (departmental communication, communication about patients, social support, or job satisfaction), or relevant health problems (work-related fatigue, emotional exhaustion).

Outcome variables

Outcome variables close to the intervention's aim were selected and defined at three levels: (a) the quality and process of the intervention assessed during the first 3 months of implementation, (b) the perceived effectiveness of the intervention and work organization, and (c) staff health.

Quality and process of the intervention

During the first 3 months of implementing the multidisciplinary structured work shift evaluations we checked whether the implementation actually took place, and performance indicators were measured to assess of whether the team had adhered to the structured content of the intervention. Working with the trainer and the trained "shift evaluation leaders," we prepared semi-structured forms with five categories of performance indicators for the multidisciplinary shift evaluation. The following performance indicators were assessed: (a) staff attendance, (b) planned time span, i.e., starting time at the end of the shift (15:30 hours) and duration of the evaluation (30 min), (c) type of interaction between the shift evaluation leader and team members (creating safe environment, taking charge as a supervisor, organizing communication in star model, cobweb model, or sharing model), (d) subjects ("pressure valve," teamwork, work roles, organizational aspects), and (e) shift evaluation leader's satisfaction. During the first 3 months of implementation the forms were completed directly following each work shift evaluation by the shift evaluation leader and helper on duty that day.

Subjective effectiveness and work organization

The subjective effectiveness of the multidisciplinary shift evaluation was assessed by two binomial questions regarding: (a) the effectiveness of the feedback training course on the quality of interpersonal communication skills and (b) effectiveness of the multidisciplinary shift evaluations on the level of team communication. A subscale in the test battery "Experience and Assessment of Work: VBBA" [16] was used as communication scale. The four items in this communication scale were reformulated in terms of patient-centered communication at the departmental level. Higher scores indicate unfavorable communication levels. Mean scale scores before and after the implementation phase were compared. One binomial question was used asking about their satisfaction regarding their communications with colleagues within their discipline and those in other disciplines. The proportion of satisfied staff members before and after the implementation phase was compared.

Staff health

We assessed work-related fatigue by means of the scale "Need for Recovery after working time" (an 11-item dichotomous scale), a subscale of a test battery [16, 17]. This measure contains items that cover the short-term aftereffects of the working day in terms of fatigue-related problems. Higher scores indicate more work-related fatigue problems after a working day. We also used the 8-item "emotional exhaustion" subscale of the Dutch version of the original Maslach Burnout Inventory [18, 19]). Responses were in seven categories ranging in frequency of occurrence from never to always. The number of implemented multidisciplinary shift evaluations were counted. Adherence to the performance indicators was calculated in relative frequencies. Success in terms of subjectively improved communication with colleagues was expressed in terms of relative risk reduction for not having satisfied communication with colleagues. Repeated measurements were analyzed. First, mean scores of all scales for t_1 and t_2 were calculated, and then we used the *t*-test for repeated measurements.

Results

Quality and process of the intervention

All staff members followed the feedback training. All 16 multidisciplinary shift evaluations were organized and carried out as planned: during the last 30 min of the day shift staff members gathered and evaluated the work shift between disciplines as planned.

Table 1 presents data on the five categories of performance indicators during the first 16 multidisciplinary shift evaluations. Each multidisciplinary shift evaluation was carried out in accordance with the structure as intended (Table 1). Below is a detailed description of the five categories.

- Staff attendance: On average 12 team members (range 8–16) were present at the start of each evaluation session. Representatives from all three disciplines were present during all evaluations.
- Planned time span: Almost all evaluations started on time, and the 30-min period proved sufficient for four out of every five evaluations.

Table 1 Performance indicators in 16 multidisciplinary structured work shift evaluations

Performance indicators	Subcategories	Success during 16 work shift evaluations
Staff attendance	Physicians	100%
	Nurses	100%
	Assistants	100%
Time-span	Starting time	94%
	Duration	81%
Type of interaction	Creating safe environment as leader	94%
	Taking charge as leader	75%
	Organizing communication as leader	
	Star model	81%
	Cobweb model	56%
	Sharing	75%
Subjects of evaluation	"Pressure valve" function	26 times
	Teamwork	23 times
	Work roles	11 times
	Organizational aspects	9 times
Shift evaluation leader satisfaction	Satisfied with evaluation of respective work shift	81%

- Type of interaction between shift evaluation leader and team members: A safe environment was created during almost all evaluations, and the supervisor took charge 12 times. Communication was structured in such predefined patterns as in the star and cobweb models.
- Subjects of evaluation: The function of a "pressure valve" emerged on 26 occasions, 5 of which involved "minor accidents" in the team. Teamwork was evaluated 23 times, and work roles 11. Organizational aspects were evaluated 9 times.
- The shift evaluation leaders reported that they were satisfied with the multidisciplinary structured work shift evaluation in 13 of the 16 times.

Subjective effectiveness and work organization

In total 44% of the staff evaluated the 1-day feedback training positively with respect to its effectiveness in improving the quality of their personal skills in communicating with colleagues thereafter; 56% did not observe personal skill improvement. Over one-third (38%) of the staff reported seeing their colleagues' skills improve at communicating with them while two-thirds did not experience this skill improvement in their colleagues. In all, 62% of the PICU staff reported that implementation of the multidisciplinary shift evaluations had a positive effect on the perceived level of team communication; about one-third did not experience this change.

Communication with colleagues improved between pre- and postintervention. At t_1, before the implementation, three-quarters of the staff (76%) were satisfied regarding their communications with colleagues; at t_2 this figure rose to 92%. In other words, a relative risk reduction of 66% emerged between pre- and post-evaluation for the chance of experiencing the communication with their colleagues as not satisfied. The proportion of staff members who were satisfied regarding their communications with colleagues in other disciplines did not change: 63% at both t_1 and t_2. Departmental-level communication about patients decreased in the expected direction, although the postimplementation measurement (36) did not differ significantly (p=0.63) from baseline (34).

Staff health

Work-related fatigue dropped non significantly on average from 26 to 23 (p=0.38). However, the mean level of problems with emotional exhaustion decreased significantly (p=0.009) from 30 to 25 after the multidisciplinary shift evaluation was implemented.

Discussion

This study demonstrates that multidisciplinary structured work shift evaluations can be successfully implemented at a PICU. The evaluations were planned at the end of the day shifts and were integrated into the work schedules of all staff. All staff members received feedback training, and eight staff physicians and nurses were trained as shift evaluation leaders. Team communication improved in the eyes of most of the beholders because of the intervention. Emotional exhaustion problems decreased during the study period. Moreover, almost all participants experienced satisfying communication with colleagues after the intervention. The observed success rates were almost optimal for the work shift evaluations in terms of staff attendance, time span, types of interaction, and subjects of discussion. Thus the quality and process of implementing the work shift evaluations was successful.

The intervention may have reduced the accumulation of stress reactions because emotional exhaustion decreased, although the study was qualitative, and no control group was used. On the organizational level, however, less emotional exhaustion could affect future staff absenteeism. The improved team communication may in turn be the key to retaining more employees and preventing unnecessary staff turnover.

A methodological consideration is that the study design would have been stronger if we had used a control group to control for other time effects. We opted for a pre/post design because the medical center at the focus of this study has only one PICU. Moreover, it proved impossible to start in only one-half of the department. However, indirectly relevant information was available during the

study period from another scientific study about nurses from all other departments in the same medical center. That study monitored the repeated need for recovery levels and emotional exhaustion levels [7, 14]. Although applied post hoc, this indirect information did not reveal the same time effects in all departments that could explain the difference in emotional exhaustion problems in our study.

Our study enhanced team communication in the eyes of the beholder by introducing multidisciplinary work shift evaluations. This intervention is thought to effectively have created an "emotional pressure valve" during working hours which may serve to prevent ongoing work-related mental activities off the job. Enhanced multidisciplinary team communication is believed to increase job satisfaction that in turn increases patient satisfaction [13]. However, better staff communication should hypothetically lead to more satisfaction with communication of the substitute decision makers in the PICU [20]. Given our findings, we feel it is feasible and appropriate to invest valuable day shift time in improving team communication, which in turn will improve the quality of teamwork. A better ability to communicate with colleagues might even be transferred to communications with patients and their relatives. Studdert et al. [2] reported that one-half of the team-family conflicts in a PICU stemmed from poor communication. The intervention presented here could even improve the efficiency and effectiveness of completing key tasks in crisis situations and thus improve clinical outcomes in the PICU environment.

A really interesting issue when introducing new organizational processes is of whether the changes observed will be long lasting: the intervention is still implemented in June 2005 in the PICU. On two fixed days a week, the multidisciplinary day shift evaluation takes place, the registration form is still filled in and used to gather high-priority- or structural issues. These issues are dealt with by the PICU management team and actions are fed back to the staff.

Conclusion

We successfully implemented a multidisciplinary structured work shift evaluation at a PICU. The work shift evaluations were planned at the end of the dayshifts and were integrated into the work schedules of the staff. Before the implementation phase began, all staff members received feedback training. In addition, eight staff members were trained to act as shift evaluation leaders. Team communication was experienced to be improved as a result of the multidisciplinary structured work shift evaluations and the staff's mean level of problems relating to emotional exhaustion decreased during the study period.

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