Changing Team Member Perceptions by Implementing TeamSTEPPS in an Emergency Department

Authors: Connie Obenrader, DNP, RN, NE-BC, Marion E. Broome, PhD, RN, FAAN, Tracey L. Yap, PhD, RN, CNE, WCC, FAAN, and Florame Jamison, DNP, APRN, CNP, Tahlequah, OK and Durham, NC

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Contribution to Emergency Nursing Practice

- The purpose of this practice improvement project was to improve communication and the team's perceptions of communication among ED staff.
- The primary outcome of this practice improvement project was the team's improved perceptions of communication and teamwork within the emergency department.
- Key implications for ED nursing practice-based on this project are implementation of the TeamSTEPPS program improves perceptions of teamwork and communication among ED staff.

Abstract

Introduction: The emergency department is an environment where teamwork and communication are of utmost importance and are the foundation for improved patient satisfaction, staff satisfaction, patient safety, and the reduction of clinical errors. An ED staff perceptions of communication and teamwork influences their ability to provide efficient, high quality care to patients.

Methods: The ED team consisted of 57 employees, including nurses, mid-level providers, and non-licensed individuals, who work within, or directly with, the department. This quality improvement project trained 57 members of the ED staff using the TeamSTEPPS training program. Forty-six of the participants completed assessments at all 3 time points (baseline, 2 weeks and one month): Team STEPPS Teamwork Perceptions and Attitudes Questionnaires and The Nursing Culture Assessment Tool (NCAT).

Results: Formal group TeamSTEPPS training improved the emergency department team members' perceptions of, and attitudes about, communication and teamwork. Discussion: As a result of TeamSTEPPS training in an Emergency Department, the staff of that department perceived that both teamwork and communication improved. The TeamSTEPPs program should be made sustainable by incorporating the verbiage and tools from the program into policy and culture within the department.

Key words: Communication; Teamwork; Perception; TeamSTEPPS; Hospital; Community hospital; Emergency department

Connie Obenrader is Nurse Practitioner at Northeastern Health System, Tahlequah, OK.

Marion E. Broome is Dean and Ruby F. Wilson Professor, School of Nursing, Duke University, Durham, NC.

Tracey L. Yap is Associate Professor, School of Nursing, Duke University, Durham, NC.

Florame Jamison is Nephrology Nurse Practitioner, Northeastern Health System, Tahlequah, OK.

For correspondence, write: Connie Obenrader, DNP, RN, NE-BC, 13899 N 510 Road, Tahlequah, OK 74464; E-mail: connie.obenrader@gmail.com.

Every health care entity strives to maintain a safe environment. To accomplish this, the workplace culture must value patient safety and quality care. Essential components of a culture of safety include communication, resources, commitment, and openness to creating structures that promote safety within the organization.[1] Nurses feel empowered when those components, including effective communication, exist as was documented in an exploratory study based on Kanter's theory of structural empowerment.[2] There are acquired assumptions—which are actually values and beliefs—about communication that are shared among occupational subgroups within every organization. Those assumptions influence the perceptions, and therefore the actions, of the individual members of the group. Mutual trust, as well as confidence in the efficacy of

preventive measures—including communication and an environment where everyone feels responsible—are components of a culture of safety.[3]

The emergency department is an environment in which teamwork and communication are of utmost importance and are the foundations for improved patient satisfaction, staff satisfaction, patient safety, and the reduction of clinical errors.[4] Each department within the hospital has a unique nursing culture. The Association of Operating Room Nurses (AORN) promotes an organizational structure that "encourages reporting, ends blame, involves senior leadership, and focuses on systems and offers standard communication as an underpinning."[5] Teamwork is enhanced by communication containing the effective exchange of information.[6] Effective communication can be arduous and challenging in a high-paced, complex environment such as the emergency department, where numerous staff members are caring for patients as part of the health care team.[7] Communication may be improved by structures or protocols that aid individuals in standardizing the order in which information is shared.[8]

One method for improving communication and team processes around safety is the use of the TeamSTEPPS program. TeamSTEPPS was developed by the Agency for Research and Quality between 2002 and 2005. The program has been used in health care across a variety of settings to improve teamwork.[9] Using structured training, a work environment can be built so it may transfer new knowledge enhancing communication, and hence safety.[10]

Setting

The setting for this project was an emergency department within a 99-bed health system in the Midwest United States. The department sees an average of 55 patients daily. There were challenges experienced among staff members during the communication processes related to patient care. The care team had developed a complacent attitude regarding communication. For example, during emergent situations, the team did not communicate with others involved in the emergency care of patients when tasks were completed. They believed that other members of their team knew them so well that they could adequately communicate by exception: meaning that unless otherwise stated, the task had been completed. Poor communication, a risky behavior, can develop as a result of a team working together daily and believing that clarifications are not needed.

The emergency nurse must be diligent in communicating all care and treatments in the emergency department. Without intentional clarification, the receiving nurse may inadvertently duplicate or omit a treatment. Implementing structured communication tools can aid the team in improving the quality of their communication. Therefore, the primary aim of this quality improvement project was to improve the perception of communication among ED team members before and after implementation of the TeamSTEPPS program and tools. A secondary aim was to improve the perception of teamwork in the emergency department.

Methods

The ED team consisted of 57 employees including nurses, nurse practitioners, physicians assistants, and non-licensed individuals who work within, or directly with, the department. This group made up the convenience sample used in this project. Exclusion criteria included those individuals who did not complete all 3 assessments. Physicians were not included in the convenience sample owing to physician staff changes that occurred midway through the project. For this repeated measures-designed project, TeamSTEPPS initial training and data collection took place during a 1-week period. Fifteen and then 30 days later, the participants were asked to complete the tools again for the data collection. To sustain the program, TeamSTEPPS was included in policy verbiage, and additional TeamSTEPPS tools were slated for implementation at a future time across selected units in the institution. New employees are introduced to TeamSTEPPS during orientation and are provided training for TeamSTEPPS tools, which are in use within the emergency department.

TeamSTEPPS is an evidence-based teamwork system derived from more than 20 years of Crew Resource Management by the Department of Defense. The program was designed to influence the following: (1) Expand the team's ability to adapt to changing situations; (2) create a shared understanding of team plans; (3) develop positive attitudes about being part of the team; and (4) establish a safe and reliable environment in which to practice.[9] The components of TeamSTEPPS have proven effective in improving communication and teamwork in many work settings including aviation, medical, nuclear power plants and community emergency agencies.

The Team STEPPS Fundamentals course was conducted in person for the ED staff.[9] The course was presented by a Master Trainer. The fundamentals course consists of video vignettes, table discussions, and role playing to learn and practice new communication skills. The new communication skills were supported by tools from the Team STEPPs program, which were selected by the ED leadership and core staff members.

TABLE 1
Communication

Instrument	Mauchly's Test of Sphericity	Time of Measurement			Significance			Result
		Before training Time 1	Fifteen days after training Time 2	Thirty days after training Time 3	Time 1 and time 2	Time 1 and time 3	Time 2 and time 3	
TTAQ	met, χ^2(2, N=43) = .91, P = .63	T1M=.3.77, SD= .03	T2M=3.91, SD= .07	T2M=3.91, SD= .07	P = .03	P = .001	P = .04	F (2, 84) = 5.44, P =.006
TTPQ	Violated[a], χ^2(2, N=43) = 27.79, $P \le$ .001	T1M=4.09, SD=.01	T2M=3.92, SD=.02	T3M=4.58, SD= .02	$P \le$ .001	P = <.001	$P \le$ .001	F (1.340, 56.29) = 439.600, $P \le$ .001
NCAT	met, χ^2(2, N=22) = 5.338, P = .07	T1M=6.273, SD=.188	T2M=6.364, SD=.168	T3M=7.500, SD=.158	P = .54	$P \le$ .001	$P \le$ .001	F (2, 42) = 25.785, $P \le$ .001

[a] Greenhouse-Geisser correction used.

TABLE 2
Teamwork

Instrument	Mauchly's Test of Sphericity	Time of Measurement			Significance			Result
		Before training Time 1	Fifteen days after training Time 2	Thirty days after training Time 3	Time 1 and time 2	Time 1 and time 3	Time 2 and time 3	
TTAQ	Violated[a], χ^2(2, N=43) = 6.165, P =.05	T1M=23.67 4, SD=.732	T2M=23.5 58, SD=.471	T3M=23.5 35, SD=.245	P = .86	P = .84	P = .96	F (2, 84) = .03, P = .97
TTPQ	Violated[a], χ^2(2, N=43) = .11.46, P = .003	T1M=3.21, SD=.13	T2M=3.40, SD=.115	T3M=3.77, SD= .078	P = .005	$P \le$ .001	$P \le$ .001	F (1.608, 67.533) = 46.920, $P \le$ .001
NCAT	met, χ^2(2, N=22) = 4.263, P =.12	T1M=15.90 9, SD=.534	T2 M=15.864, SD=.385	T3M=17, SD=.406	P = .89	P = .02	P = .001	F (1.678, 35.237) = 7.023, P = .004

[a] Greenhouse-Geisser correction used.

TABLE 3
Situation Monitoring

| Instrument | Mauchly's Test of Sphericity | Time of Measurement | | | Significance | | | Result |
		Before training Time 1	Fifteen days after training Time 2	Thirty days after training Time 3	Time 1 and time 2	Time 1 and time 3	Time 2 and time 3	
TTAQ	violated, $\chi^2(2, N=43)$ = 9.16, P =.010 Greenhouse-Geisser correction used	T1M=3.98, SD=03	T2M=4.05, SD=.07	T3M=4.42, SD=.14	P = .02	P = .002	P = .50	$F(1.67, 69.99)$ = 101.68, P = .004
TTPQ	Violated,[a] $\chi^2(2, N=43)$ = 39.10, $P \leq .001$	T1M=3.43, SD=.09	T2 M=3.67, SD=.06	T3M=4.40, SD=.06	$P \leq .001$	$P \leq .001$	$P \leq .001$	$F(1.24, 52.02)$ = 266.92, $P \leq .001$

[a] Greenhouse-Geisser correction used.

Members of the ED sample completed the 3 questionnaires on paper before the training sessions and again at 15 and 30 days later. Responses were tracked by individual members of the team. Participants were asked to create an identifier, known only to them, so that questionnaires could be paired for evaluation of individual change in perception and attitude.

The Team STEPPS Teamwork Perceptions Questionnaire (TTPQ) is a 35-question, 5-point Likert scale tool used to measure an individual's perceptions of group-level teamwork.[9] The TTPQ items reflect 5 constructs, and for the purpose of this performance improvement project, the constructs of team function, situation monitoring, mutual support, and communication were used. Coefficients ranged from 0.57 to 0.79, and correlations were greater than 0.6 and believed to be valid. The TTPQ should be used before and after a teamwork intervention to measure effectiveness and should not be modified.[11]

The Team STEPPS Teamwork Attitudes Questionnaire (TTAQ) is a 30-question, 5-point Likert scale tool that is useful to provide a quantitative assessment of individual attitudes as they relate to teamwork and care delivery.[9] The scale reliabilities for the TTAQ exceeded 0.7 and was found to be moderately correlated.[12] The TTAQ may be used alone, or in conjunction with other instruments and is suitable for a single department or organization wide. It is suitable to measure the effectiveness of the TeamSTEPPS program by comparison of pre- and post-assessments.[12] There are 5 constructs included in the TTAQ. For this project team structure, situation monitoring, mutual support and communication were used.

The Nursing Culture Assessment Tool (NCAT) is a 19-question tool that measures 6 dimensions of occupational subculture of nursing within an organization.[13-15] Of the 6 dimensions within the NCAT, only 3 dimensions—behavior, teamwork, and communication—were relevant to this project and were used. The NCAT's validity and reliability have been tested in previous studies evaluating psychometrics of the measure and those analyses supported the independence of each subscale. The scale reliabilities for NCAT are equal to or exceed 0.70 for Cronbach's alpha and are considered adequate for assessment of perception of nursing culture.[13-15]

The sample participants were asked to complete the TTAQ, TTPQ, and NCAT before training and then at 15 and 30 days after training. The survey data for each was entered into an Excel database and imported to IBM's SPSS v.23 (SPSS, IBM, Armonk, New York) for the statistical analysis. To compare all 3-time point assessment scores on the NCAT, TTPQ, and TTAQ, repeated measures of analysis of variance (ANOVA) statistical tests were

TABLE 4
Mutual Support

Instrument	Mauchly's Test of Sphericity	Time of Measurement			Significance			Result
		Before training Time 1	Fifteen days after training Time 2	Thirty days after training Time 3	Time 1 and time 2	Time 1 and time 3	Time 2 and time 3	
TTAQ	met, χ^2(4.11 N=43) = 4.12, P = .13	T1M=2.94, SD=.07	T2M=2.99, SD= .05	T3M=3.22, SD= .04	P = .43	P = .001	$P \leq .001$	F (2, 84) = 9.67, P = .13
TTPQ	Violated[a], χ^2(2, N=43) = 54.34, $P \leq .001$	T1M=4.11, SD=.06	T2M=4.26 SD =.034	T3M=4.45, SD=.02	P = .02	$P \leq .001$	$P \leq .001$	F (1.15, 48.43) = 23.44 $P \leq .001$

[a] Greenhouse-Geisser correction used.

TABLE 5
Behavior

Instrument	Mauchly's Test of Sphericity	Time of Measurement			Significance			Result
		Before training Time 1	Fifteen days after training Time 2	Thirty days after training Time 3	Time 1 and time 2	Time 1 and time 3	Time 2 and time 3	
NCAT	Violated[a], χ^2(2, N=22) = 10.33, P = .006	T1M=9.82, SD=.34	T2M=9.59, SD=.25	T3M=10.5 9, SD=.22	P = .37	P = 03	$P \leq .001$	F (1.43, 29.93) = .00, $P < .05$

[a] Greenhouse-Geisser correction used.

conducted on construct average scores (1 test for each construct in each questionnaire). Because of multiple tests within the sample, alpha was set to 0.01, and the results compared with those in literature.[16-18]

Findings and Discussion

Of the 57 employees who participated, 43 completed the assessment tools for each of the 3 time points and were included in the results. Twenty-two nurses completed the NCAT at each of the 3 assessment times and were included in the results. Statistical results for each of the 5 areas measured are provided in Tables 1 through 5.

In this project, the scores from the TTAQ and the TTPQ indicated that the team improved attitudes and perceptions about communication as a result of TeamSTEPPS training. Scores for the TTAQ communication construct were consistent with ranges used to validate the tool in other studies, which reported the mean to be 4.28 with a range of 2.17.[12] The TTPQ scores were reported as a mean of 3.81, with minimum scores of 1.86 and maximum scores of 5.0 for the communication construct.[11] Both tools yielded higher scores on the pretraining assessment than they did at the assessment conducted at the end of the actual training session, suggesting it is possible that the training actually heightened the participants' awareness of their communication patterns, and they were more realistic on the second measure. However, the communication score increased at the final assessment 30 days after training occurred, which could be a reflection of the heightened awareness and the opportunity to practice what the team members learned in the training. It is interesting that in a previous study, conducted in 54 long-term care facilities, a NCAT communication normative mean score of 9.7 was reported.[14] The results of the TTAQ, TTPQ, and NCAT were consistent with one another at 30 days post-training and indicated that the group had continuous and consistent improvement in communication after the TeamSTEPPS training occurred.

Both the TTPQ and the NCAT indicated that the teamwork among the group improved from the time of training until 30 days post-training. The TTAQ published mean score is 4.20, whereas the published normal Team Structure mean within the TTPQ is 3.63.[11,12] The construct of teamwork consisted of TTAQ team structure, TTPQ team function, and NCAT teamwork. The NCAT Teamwork normative mean score reported is 10.78, which was in long-term care and is lower than the results

obtained in this study, performed in the emergency department; however, the NCAT is indicated for intra-organization comparison.[13,14] The close working relationships that exist within a smaller emergency department should be considered as contributing to the overall improvement in teamwork construct scores. The TeamSTEPPS program training allowed the team to identify how a high-functioning team works and then allowed them to build their teamwork skills using new tools as well as old strong relationships.

Scores on the TTAQ indicated that the group's attitude about situation monitoring improved as a result of the TeamSTEPPS training. The TTPQ results indicated that the group increased their perception of the importance of their engagement in situation monitoring continuously throughout the project. Situation Monitoring construct means reported in a previous study for the TTAQ were 4.27.[12] For the TTPQ, a mean of 3.59 was reported for the same construct.[17] The attitudes of the team about situation monitoring decreased throughout the project, which was not demonstrated in other studies. Both the TTAQ and the TTPQ indicated that the group increased their mutual support throughout the project. Means for the construct have been reported as M 4.19 and M 3.66 for the TTAQ and TTPQ, respectively.[11,12]

A previously reported NCAT behavior mean score of 9.8, which is congruent with the results obtained in this study, has been reported in the literature.[18] The NCAT assessment results indicated that the nurses scored themselves higher prior to TeamSTEPPS training but, after completion of the training, decreased their assessment scores. However, the group did demonstrate that they believed there to be an increase in the group's behavior from the time of training until 30 days post-training. This was, as mentioned before, also congruent with their other measures as well. Prior to the training sessions, the nurses related they did not have a consistent assessment tool to measure their actions and that the TeamSTEPPS training provided them with a standard from which to measure their behaviors.

Implications for Emergency Nurses

Teamwork and communication are crucial to the work that is carried out in health care. Development of multidisciplinary teams to lead the implementation of the TeamSTEPPS program is essential to high-quality patient care and outcomes. Leaders of multidisciplinary care teams

should receive training together through 1 of the AHRQ Regional Training Centers or online through the TeamSTEPPS program. The Team STEPPs program should be made sustainable by incorporating the verbiage and tools from the program into policy and culture within the department. When implementing the Team STEPPs program, 1 strategy to increase staff engagement in a TeamSTEPPS project would be to decrease the number of tools used to measure outcomes. After this project, participants related that they became fatigued with completing the 3 evaluation tools on 3 different occasions. After reflection when the project was completed, we decided that initiating the huddle strategy, from TeamSTEPPS early on in the change process could be used to increase adoption of communication processes. The huddle strategy is an *ad hoc* meeting quickly conducted to re-establish situational awareness, reinforce plans already in place, and assess the need to adjust the plan. The frequency of huddles, their use, and acceptance by staff could be used as 1 measure to assess adoption of improved communication.

Conclusion

This performance quality improvement project of implementing TeamSTEPPS within an emergency department demonstrated that the TeamSTEPPS program is beneficial to hospitals outside the larger metropolitan areas. The results of this project indicate that the staff in the emergency department increased their overall attitudes and perceptions of teamwork and communication among them. The emergency department is a unique environment where the employee must work independently as well as work as a team. The TeamSTEPPS program provided the awareness and tools for the members of the ED staff to recognize their gaps in communication and teamwork. At the same time, the program provided the tools needed to overcome those deficits. The familiarity the team has with each other may actually augment the benefits of formal team training and should be leveraged to improve both teamwork and communication within the emergency department.

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