Supplement: Promoting a Culture of Safety as a Patient Safety Strategy

Data Supplement: Search Strategies

All from January 2000-June 2012

PubMed: Search Strategy:

“patient safety culture” OR “safety culture survey” OR “safety attitude questionnaire” OR “safety attitudes questionnaire” OR “safety attitude” OR “patient safety practice” OR (“Hospital Survey” AND “patient safety culture”) OR “Manchester Patient Safety Framework” OR (“Patient Safety Culture” AND survey) OR “patient safety climate” OR ((“safety culture” OR “safety practice” OR “safety climate” OR “high reliability”)

AND

(rehabilitation OR snf OR “nursing home” OR “skilled nursing facility” OR hospital OR hospitals OR ICU OR intensive care unit OR “emergency room” OR attitude OR attitudes OR “assisted living” OR “long term care” OR resident OR residents OR “health center” OR healthcare OR “health care” OR patients OR patient OR intervention OR improvement OR scale OR “primary care”)) OR “hospital patient climate safety scale”
OR “culture of safety” OR “culture of trust” OR (culture[ti] reliability[ti])

CINAHL:
Search Strategy:

"patient safety culture" OR "safety attitude questionnaire" OR "patient safety practice" OR "hospital survey on patient safety" OR "manchester patient safety framework" OR "hospital patient climate safety scale" OR "culture of safety" OR "culture of reliability" OR "culture of trust"

OR

("safety culture" OR "safety practice" OR "safety climate" OR "high reliability"

AND

"skilled nursing facility" OR hospital OR hospitals OR ICU OR intensive care unit OR "emergency room" OR attitude OR attitudes OR "assisted living" OR "long term care" OR resident OR residents OR "health center" OR healthcare OR "health care" OR patients OR patient OR intervention OR improvement OR scale OR "primary care")

Cochrane:
Search Strategy:

"patient safety culture" OR "safety attitude questionnaire" OR "patient safety practice" OR "hospital survey on patient safety" OR "manchester patient safety framework" OR "hospital patient climate safety scale" OR "culture of safety" OR "culture of reliability" OR "culture of trust"

OR

("safety culture" OR "safety practice" OR "safety climate" OR "high reliability"

AND

"skilled nursing facility" OR hospital OR hospitals OR ICU OR intensive care unit OR "emergency room" OR attitude OR attitudes OR "assisted living" OR "long term care" OR resident OR residents OR "health center" OR healthcare OR "health care" OR patients OR patient OR intervention OR improvement OR scale OR "primary care")

EMBASE
Search:
no mapping or exploding of terms and unchecked “medline”
Search Strategy:

"patient safety culture" OR "safety attitude questionnaire" OR "patient safety practice" OR "hospital survey on patient safety" OR "manchester patient safety framework" OR "hospital patient climate safety scale" OR "culture of safety" OR "culture of reliability" OR "culture of trust"

OR

("safety culture" OR "safety practice" OR "safety climate" OR "high reliability"

AND

"skilled nursing facility" OR hospital OR hospitals OR ICU OR intensive care unit OR "emergency room" OR attitude OR attitudes OR "assisted living" OR "long term care" OR resident OR residents OR "health center" OR healthcare OR "health care" OR patients OR patient OR intervention OR improvement OR scale OR "primary care")

PsycInfo Search:

Search Strategy:

"patient safety culture" OR "safety attitude questionnaire" OR "patient safety practice" OR

"hospital survey on patient safety" OR "manchester patient safety framework" OR "hospital patient climate safety scale" OR "culture of safety" OR "culture of reliability" OR "culture of trust"

OR

("safety culture" OR "safety practice" OR "safety climate" OR "high reliability"

AND

"skilled nursing facility" OR hospital OR hospitals OR ICU OR intensive care unit OR "emergency room" OR attitude OR attitudes OR "assisted living" OR "long term care" OR resident OR residents OR "health center" OR healthcare OR "health care" OR patients OR patient OR intervention OR improvement OR scale OR "primary care")

Data Supplement: Evidence Tables

***Table 1*: Study characteristics and intervention.**

Author, year	Study design	Sample Size* (Response Rate)	Measurement tool
Abstoss, 2011 (43)	Pre–post	*n* = 85 (90%) 1 PICU, 1 academic medical center	SAQ *only 13 items related to medication error/reporting
Blegen, 2010 (36)	Pre–post	*n* = 368 (81%) 3 inpatient medical units, 3 hospitals	HSOPS
Frankel, 2008 (21)	Pre–post	*n* =1, 256 (60%) 21 patient care areas, 2 teaching hospitals	SAQ
Haynes, 2011 (44)	Pre–post	*n* = 257 (7 sites) 7 out of 8 international sites involved in the WHO Safer Surgery Checklist study	SAQ *6 items only
McCulloch, 2009 (47)	Pre–post	Not reported for SAQ OR clinicians and staff at UK teaching hospital	SAQ
Muething, 2012 (25)	Time series	*n* = 3752 (31%) at last measurement period, 1large, urban pediatric academic medical center	HSOPS
O'Leary, 2010 (27) O'Leary, 2011 (28)	Concurrent control	*n* = 147 (92%) 2 general medicine units, 1 tertiary care teaching hospital *n* = 49 (84%) 1 hospitalist unit, 1 tertiary care teaching hospital	SAQ
Pettker, 2009 (29) Pettker, 2011 (26)	Pre–post	*n* = 183 (72%) 1 obstetrical service, 1 larger tertiary-level academic medical center	SAQ
Pronovost, 2005 (41)	Quasi-stepped wedge	WICU *n* = 64 (86%) SICU *n* = 23 (84%) 2 ICUs, 1 academic tertiary care hospital	SCS
Riley, 2011 (45)	Cluster RCT	*n* = 134 (not reported) 3 labor and delivery units, 3 community hospitals	SAQ
Saladino, 2012 (39)	Pre–post	*n* = 55 (69%) 1 medical-surgical critical care unit in medium sized community hospital	SAQ
Sexton, 2011 (46)	Pre–post	*n* = 3,533 (73%) 71 ICUs nested in 71 hospitals	SAQ
Simpson, 2011 (38)	Pre–post	*n* = 15 hospitals Perinatal care units	SAQ

Author, year	Study design	Sample Size* (Response Rate)	Measurement tool
Thomas, 2005 (22)	Cluster RCT	*n* = 1,000 (55%) *report results for 598 nurses 23 units, 1 tertiary care teaching hospital	SAQ
Tiessen, 2008 (37)	Pre–post	*n* = 112 (35%) 1 acute care, rural community hospital	PSCHO
Timmel, 2010 (40)	Pre–post	*n* = 28 (100%) 1 surgical unit, 1 academic tertiary care hospital	SAQ
Vigorito, 2011 (42)	Concurrent control	*N* = 918 (85%) 23 ICUs in 11 hospitals	SAQ
Weaver, 2010 (48)	Pre–post	*n* =28 (51%) 2 community hospitals, 3 surgical teams in each hospital	HSOPS *4 dimensions
Wolf, 2010 (49)	Pre–post	*n* = 44 (not reported); 4863 debriefing forms OR clinicians and staff in academic referral VA	SAQ

*Post sample size reported, SAQ = Safety Attitudes Questionnaire, HSOPS = Hospital Survey on Patient Safety Culture, SCS = Safety climate scale, PSCHO = Patient Safety Climate in Healthcare Organizations, CUSP = Comprehensive Unit-Based Safety Program, CPOE = Computerized Physician Order Entry

***Table 2*: Intervention types**

Author, year	Study design	Intervention			
		Description	TT/CT	EW/IR	CUSP
Abstoss, 2011 (43)	Pre–post	Multi-component: Feedback, QI education, CPOE, medication management, report form	Yes		
Blegen, 2010 (36)	Pre–post	Multi-component: Triad for Optimal Patient Safety (TOPS) including team training, unit based safety team, patient engagement in daily goals	Yes		
Frankel, 2008 (21)	Pre–post	Executive walk rounds		Yes	
Haynes, 2011 (44)	Time-series	Multi-component: 15 prevention practices, 9 detection practices, 5 corrective practices	Yes		
McCulloch, 2009 (47)	Pre–post	Crew Resource Management course followed by 3 months of coaching 2 times per week	Yes		
Muething, 2012 (25)	Time-series	Multi-component: Error prevention training coaching, family engagement, restructured patient safety governance, lessons learned program, cause analysis program, executive rounds	Yes	Yes	
O'Leary, 2010 (27) O'Leary, 2011 (28)	Concurrent control	Structured interdisciplinary rounds		Yes	
Pettker, 2009 (29) Pettker, 2011 (26)	Pre–post	Multi-component: protocol standardization, creation of patient safety RN position and patient safety committee, team skills training	Yes		
Pronovost, 2005(41)	Quasi-stepped wedge	Comprehensive Unit-Based Safety Program			Yes
Riley, 2011 (45)	Cluster RCT	TeamSTEPPS: Didactic training with in-situ simulation versus didactic only	Yes		
Saladino, 2012 (39)	Pre–post	Comprehensive Unit-Based Safety Program			Yes
Sexton, 2011 (46)	Pre–post	Comprehensive Unit-Based Safety Program			Yes

Simpson, 2011 (38)	Pre–post	Comprehensive Unit-Based Safety Program within a collaborative			Yes
Thomas, 2005 (22)	Cluster RCT	Executive walk rounds		Yes	
Tiessen, 2008 (37)	Pre–post	Multi-component: measure culture, patient safety education, share stories, weekly executive walk rounds, prioritize improvement efforts, identify staff safety concerns, implement improvements		Yes	
Timmel, 2010 (40)	Pre–post	Comprehensive Unit-Based Safety Program			Yes
Vigorito, 2011 (42)	Concurrent Control	Comprehensive Unit-Based Safety Program within a collaborative; analyses focus on use of safety culture action plan			Yes
Weaver, 2010 (48)	Pre–post	Team training	Yes		
Wolf, 2010 (49)	Pre–post	Team training, debriefing/checklists, long-term monitoring	Yes		

*tt= team training, team communication intervention, or team communication tool (e.g., briefing checklist), EW = executive walk rounds or interdisciplinary rounding intervention, CUSP = comprehensive unit-based safety program intervention

***Table 3*: Reported outcomes for studies evaluating interventions to promote a culture of safety.**

Author, year	Study design	Safety Culture Survey	Care Processes	Patient Outcomes	Clinician Outcomes
Abstoss, 2011 (43)	Pre–post	Safety climate^{+} Teamwork climate^{+}*		Reported errors resulting in harm^{+}*	
Blegen, 2010 (36)	Pre–post	Significant improvement in 5 of 10 dimensions^{+*}			
Frankel, 2008 (21)	Pre–post	Significant improvement in safety climate in 1 hospital (pre = 65%, post = 77%)$^{+*}$, improvement trend in second hospital, but not significant (pre = 46%, post = 56%)$^{+}$			
Haynes, 2011 (44)	Time-series	1 of 3 targeted dimensions improved significantly (non-punitive response to error)$^{+}$*		Significant reduction (24%) in code rates only for 12 hospitals submitting data 12months following collaborative $^{+}$*	
McCulloch, 2009 (47)	Pre–post	Safety climate increased significantly, other dimensions did not as hypothesized $^{+}$*	Quality of observed teamwork behaviors improved significantly (pre = 37, post =38.7) $^{+}$*		
Muething, 2012 (25)	Time-series	10 of 14 dimensions significantly improved from 2007-2009 $^{+*}$		Serious safety events decreased from 0.9 pre to .3 post.$^{-*}$ Days between safety events 19.4 pre to 55.2 post $^{-}$*	

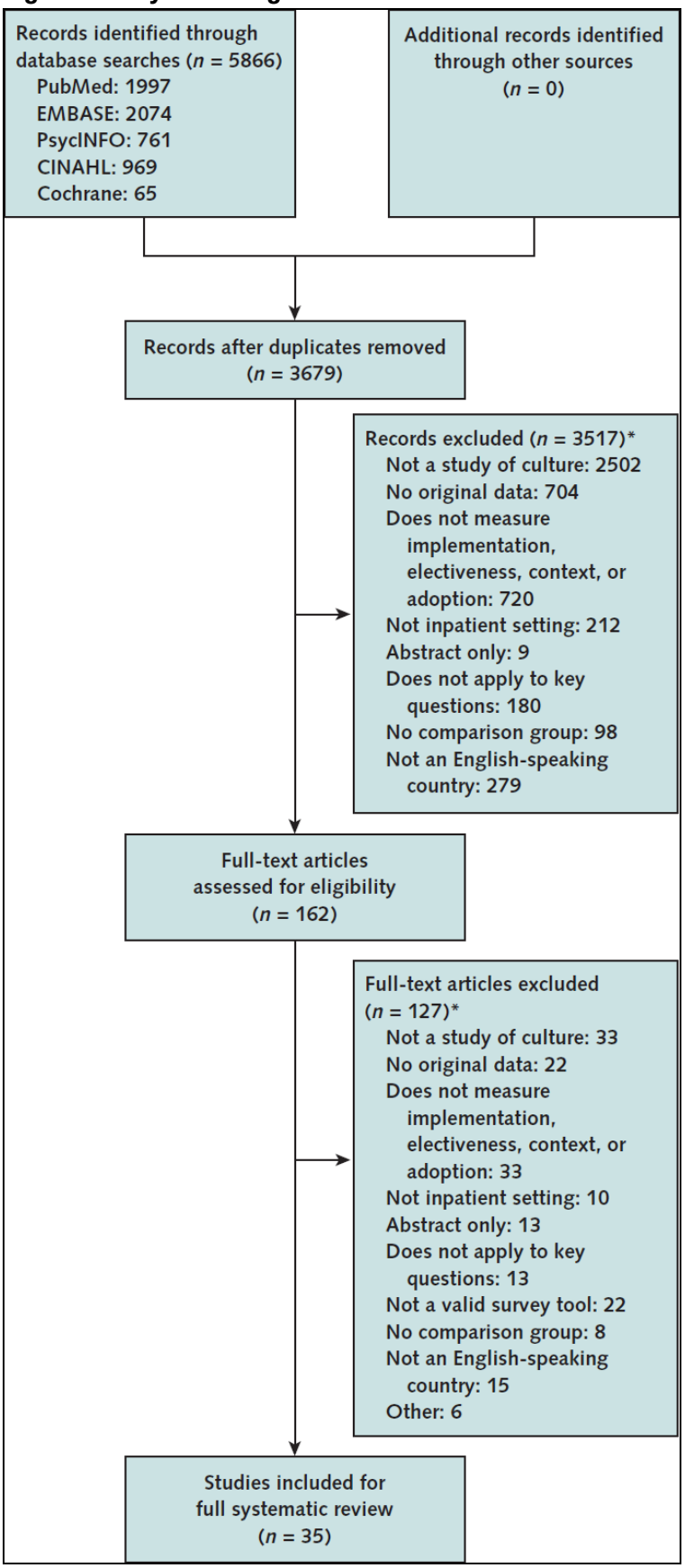
O'Leary, 2010 (27) O'Leary, 2011 (28)	Concurrent control	Teamwork climate and safety climate significantly increased [+*]	Perceived quality of communication and collaboration significantly higher in intervention group (80% vs. 54%)	Adjusted LOS was 0.19 days longer for the intervention unit vs. control n.s. (p = 0.17) Adjusted cost was $24.05 less for the intervention unit vs. control n.s. (p = 0.94)	
Pettker, 2009 (29) Pettker, 2011 (26)	Pre–post	Significant improvements in 4 domains[+*], significant reduction in 1 domain[-*]		Significant improvement in Adverse Outcomes Index (pre= 3.3%, post =1.6%)[+*]	
Pronovost, 2005 (41)	Quasi-stepped wedge	Significant improvement in 8 of 10 questions[+*]		Significant improvement in length of stay (pre = 2d, 3d, post = 1d, 2.3d)[+*]	Nurse turnover decreased (pre= 9%, post = 2%)[+]
Riley, 2011 (45)	Cluster RCT	No significant change		Significant reduction in perinatal patient harm (WAOS score pre = 1.15, post = 0.72) [+]*	
Saladino, 2012 (39)	Pre–post	Scores for all 7 domains reported, no significant change in any	Staff concerns resolved (77 issues identified through staff survey and rounds, 44 resolved)		
Sexton, 2011 (46)	Pre–post	Significant improvement in safety climate (pre= 42.5%, post = 52.2%)[+*]			

Simpson, 2011 (38)	Pre–post	5 of 7 domains increased[+] (No statistical tests reported)	Labor inductions reduced 62%[+*], elective C-sections reduced 68%[+*], scores on induction care improved 114%[+*], perfect scores on failure to rescue tool improved 81%[+*], scores on second stage labor care improved 98%[+*]	Apgar scores < 7 reduced 51%, but not significant[+]	
Thomas, 2005 (22)	Cluster RCT	Significant improvement in safety climate (pre= 52.5%, post = 72.9%)[+*]			
Tiessen, 2008 (37)	Pre–post	Significant improvement on only 2 of 30 items+*, significant decrease on one item-* (no domain scores reported)			
Timmel, 2010 (40)	Pre–post	Significant improvement on 6 of 7 domains+*			Nurse turnover decreased (pre= 25%, post = 0%) (no statistical test reported)
Vigorito, 2011 (42)	Concurrent Control	Greater improvements in 6 of 7 domains in intervention group, but not statistically significant[+]		Intervention group achieved greater reduction in CLABSI rates and VAP rates, but not statistically significant[+]	
Weaver, 2010 (48)	Pre–post	No significant difference between groups over time	Observational measures of behavior in the OR (e.g., communication, teamwork) [+]*		

Wolf, 2010 (49)	Pre–post	Statistically significant improvements in 2 out of 6 domains[+*]	Decreased care delays [+]* Hand-off issues [+]*

+ = Improved, but not statistically significant, +* = Improved and statistically significant, $p < .05$, -* = decreased and statistically significant, $p < .05$

Figure. Study flow diagram.



* The number of reasons for exclusion is higher than the number of exclusions because both reviewers did not have to cite the same reason for excluding the record or article.