

Patient Safety Culture and Nurse-Reported Adverse Events in Outpatient Hemodialysis Units

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Aims: Patient safety culture is an important quality indicator in health care facilities and has been associated with key patient outcomes in hospitals. The purpose of this analysis was to examine relationships between patient safety culture and nurse-reported adverse patient events in outpatient hemodialysis facilities. **Methods:** A cross-sectional correlational, mailed survey design was used. The analytic sample consisted of 422 registered nurses who worked in outpatient dialysis facilities in the United States. The Handoff and Transitions and the Overall Patient Safety Grade scales of the Agency for Healthcare Research and Quality's (AHRQ) Hospital Patient on Safety Survey were modified and used to measure patient safety culture in outpatient dialysis facilities. Nurse-reported adverse patient events was measured as a series of questions designed to capture the frequency with which nurses report that 13 adverse events occur in the outpatient dialysis facility setting. **Results:** Handoff and transitions safety during patient shift change in dialysis centers was perceived negatively by a majority of nurses. On the other hand, a majority of nurses rated the overall patient safety culture in their dialysis facility as good to excellent. All relationships between patient safety culture items and adverse patient events were in the expected direction. Negative ratings of handoffs and transitions safety were independently associated with increased odds of frequent occurrences of vascular access thrombosis and patient complaints. Negative ratings of overall patient safety culture in dialysis units independently associated with increased odds of frequent occurrences of medication errors by nurses, patient hospitalization, vascular access infection, and patient complaints. **Conclusion:** Findings from this analysis indicate that a positive patient safety culture is an important antecedent for optimal patient outcomes in ambulatory care settings.

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Keywords: patient safety culture; hemodialysis; adverse events

1 **A**vast majority of health care in the United States takes place in outpa-
2 tient or ambulatory care settings (Agency for Healthcare Research and
3 Quality, 2012). Despite this fact, efforts to improve patient safety have
4 focused largely on inpatient settings, and less is known about safety culture in
5 care settings outside of the hospital. Outpatient hemodialysis centers are a type
6 of ambulatory care setting that is the most common site of long-term hemodialy-
7 sis therapy for persons with chronic kidney failure. Nearly 90% of persons with
8 this condition in the United States receive hemodialysis treatments three times a
9 week in 6,000 outpatient dialysis centers (United States Renal Data System, 2013).
10 Currently, more than 60 million hemodialysis treatments in outpatient settings are
11 performed annually in the United States. Although hemodialysis in an outpatient
12 setting is a routine mode of treatment, it is a complex and potentially hazardous
13 procedure (Holley, 2010). Moreover, it is well established that there are major gaps
14 in the safety net around this procedure (Himmelfarb, 2010), and there has been
15 little research dedicated to assessing and improving the safety of patients in this
16 critical outpatient setting.

ADVERSE EVENTS IN HEMODIALYSIS PATIENTS

22 Multiple patient safety risks and adverse events are readily apparent in outpa-
23 tient hemodialysis units. In the past decade, surveys of dialysis professionals and
24 patients that focused on safety issues in dialysis units revealed these outpatient
25 settings share important patient safety risks including patient falls, medica-
26 tion errors, failure to follow established policies, errors in dialysis machine
27 preparation, lapses in infection control, vascular access-related events, excess
28 blood loss/prolonged bleeding, and lapses in communication (DeVivo, 2001;
29 Renal Physicians Association, 2007). In addition, a review of adverse events in
30 four outpatient hemodialysis units during an 18-month period revealed a total
31 of 88 events over this time span, including infiltration of the vascular access,
32 medication errors, dialysis circuit clotting, and falls in the dialysis unit after the
33 treatment (Holley, 2006). A lack of adherence to the prescribed hemodialysis
34 session length (shortened treatments) and to the session schedule (skipped
35 treatments) are also frequent adverse events among persons receiving long-
36 term hemodialysis treatments and significant contributors to hospitalization
37 and mortality (Saran et al., 2003; Tapolyai et al., 2010). Likewise, findings from
38 an investigation of nurse-reported adverse patient events in outpatient hemodi-
39 alysis facilities (Thomas-Hawkins, Flynn, & Clarke, 2008) revealed nurse reports
40 of frequent occurrences of adverse patient events in their dialysis units such
41 as skipped and shortened dialysis treatments, hypotensive episodes during the
42 dialysis procedure, and patient complaints. These findings support the assertion
43 that hemodialysis can be potentially hazardous for patients. In addition, there has
44 been little research dedicated to assessing and improving the safety of patients
45 in this critical outpatient setting.

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PATIENT SAFETY CULTURE IN HEMODIALYSIS UNITS

To improve patient safety, the Institute of Medicine (IOM, 2004) recommends that all health care facilities across the care continuum develop and maintain a culture of patient safety. According to the Agency for Healthcare Research and Quality (AHRQ, 2014), a culture of safety is a commitment at all levels of the organization to minimize adverse patient events in the face of inherently complex and potentially hazardous procedures. AHRQ has conceptualized patient safety culture as a multi-dimensional concept, and two dimensions were examined in this study. The first of these is employees' "overall grade" of patient safety, from excellent to failing, in their workplace. Importantly, an emerging body of research indicates that employees' fair to failing ratings of patient safety in their hospitals are associated with adverse patient events such as medication errors (Chang & Mark, 2011; Hofman & Mark, 2006) and iatrogenic pneumothorax and infections following surgical procedures (Mardon, Khanna, Sorra, Dyer, & Famolaro, 2010).

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The second patient safety culture dimension examined in this study was "patient handoff and transitions." An effective patient handoff and transition within and across health care settings is a process that includes interactive communication, up-to-date accurate information, limited interruptions, a process for verification, and an opportunity to review any relevant patient data (The Joint Commission, 2010). Ineffective transitions and handoffs, however, are common and have been linked with adverse patient events such as misdiagnosis, incorrect treatments, and failure to communicate follow-up with patients (Gandhi, 2005; Mardon et al., 2010). Unlike patient handoffs and transitions that occur during "nurse change-of-shift" periods in hospital settings, "patient shift change" in outpatient hemodialysis units is a common patient transition period. During these patient changeover periods that occur multiple times per day in a single hemodialysis unit, cohorts of patients concurrently transition in or out of the hemodialysis unit before or after their treatments. A patient shift change goal is to safely terminate hemodialysis treatments for a group of patients while simultaneously safely initiating treatment for the next shift of incoming patients. Notably, patient transition periods in outpatient hemodialysis facilities provide ample opportunity for misinformation, miscommunication, and error. Moreover, increased interruptions and demands on nurses' time during patient transition periods can threaten patient safety and lead to adverse patient events (Clancy, 2011; IOM, 2004).

THEORETICAL FRAMEWORK

Despite the patient safety challenges in outpatient hemodialysis units, little attention has been allocated to assessing the patient safety cultures of these health care settings. Consequently, there is little evidence on which to guide strategies to ensure patient safety during peak patient transition times. The nursing organization and outcomes model (Aiken, Clarke, & Sloane, 2002) provides a particularly efficient explanation of how patient safety culture in dialysis units influences adverse patient events. The model postulates that a high-quality work environment is an

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1 organizational feature that influences positive patient outcomes. One characteristic
 2 of a high-quality work environment is the presence of a culture that supports and
 3 fosters patient safety. The model also posits that high-quality work environments
 4 enhance the quality of nursing care processes, such as care provided during patient
 5 transitions in dialysis units. In turn, safe care processes result in superior patient
 6 outcomes. For this study, a high-quality work environment was represented as nurses'
 7 grades for patient safety in their dialysis unit. Quality nursing care processes were
 8 represented as nurses' ratings of patient transition safety during patient shift change,
 9 and patient outcomes were represented as nurse-reported adverse patient events.

11 STUDY PURPOSE

12 Little is known regarding the state of patient safety in outpatient hemodialysis settings,
 13 nor is there any evidence regarding the impact of safety cultures on the frequency
 14 of adverse event occurrences among patients receiving hemodialysis treatments in
 15 outpatient settings. The purpose of this study was to investigate associations among
 16 staff nurses' ratings of patient transition safety, nurses' grade for patient safety in
 17 their dialysis unit, and the odds of nurse reports of adverse patient events in their
 18 dialysis units. This study was designed to address the following research questions:

- 21 1. What percentage of nursing staff in dialysis facilities report positive ratings of
- 22 (a) patient transition safety and (b) patient safety?
- 23 2. What are the associations between nurse-rated patient transition safety and the
- 24 odds of nurse-reported adverse patient events in outpatient hemodialysis units?
- 25 3. What are the associations between nurses' patient safety grade and the odds of
- 26 nurse-reported adverse patient events in outpatient hemodialysis units?

29 METHODS

30 A cross-sectional, correlational design was used for this study. The analysis of
 31 nurses' patient safety grade for their dialysis units, nurses' rating of patient transi-
 32 tion safety, and nurse-reported adverse patient events described here uses second-
 33 ary data collected between September 2007 and November 2007 in a parent study
 34 conducted in the United States that was designed to disentangle the relationships
 35 among nurse staffing, omitted care, and outcomes in outpatient hemodialysis
 36 settings (Flynn, Thomas-Hawkins, & Clarke, 2009; Thomas-Hawkins et al., 2008).
 37 The Rutgers University Institutional Review Board approved the study.

40 SAMPLE

41 A modified Dillman survey method was used for data collection in the parent study
 42 (Dillman, 2007). Two thousand registered nurses (RNs) who identified themselves
 43 as staff nurses in hemodialysis settings were randomly selected from the American
 44 Nephrology Nurses' Association's membership list to receive survey packets mailed

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to their homes. Rather than mailing potential participants an advance notice letter prior to receipt of the full survey, the Dillman method was modified. Participants were initially mailed the full survey with a cover letter that described the study purpose and indicated their completion of the questionnaire served as consent to participate. One week after the initial mailing, nonresponders were sent a reminder postcard. Two weeks later, nonresponders were mailed a full survey with a follow-up reminder postcard 1 week later. A survey response rate of 52% resulted in data from 1,015 nephrology RNs across the United States. Among these, 422 RNs representing 47 of the 50 states indicated they worked as staff RNs at an outpatient hemodialysis unit, and therefore, comprised the analytic sample for this analysis. The demographic characteristics of the study sample are presented in Table 1.

MEASURES

Nurse-reported adverse events were measured as a series of survey items designed to capture the frequency with which 13 adverse patient events occurred in the dialysis unit in the past year. The adverse patient events reported in the survey are common

TABLE 1. Characteristics of Study Sample

	<i>M</i>	<i>SD</i>
Age (years)	48.6	8.1
Years in current position	7.8	6.8
Years working for current employer	10.4	9.2
Years in nephrology nursing	13.2	8.6
Gender	<i>n</i>	%
Female	394	93.4
Male	26	6.2
Not reported	2	0.5
Race	<i>n</i>	%
African American/Black	29	6.9
Asian/Pacific Islander	31	7.4
Hispanic	8	1.9
White	346	82.0
Other	5	1.1
Not reported	3	0.7
Nursing education	<i>n</i>	%
Diploma	76	18.0
Associate degree	153	36.3
Baccalaureate degree	173	41.0
Master's degree	11	2.6
Not reported	9	2.1

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1 among hemodialysis patients and have been identified as important patient safety
 2 indicators in outpatient hemodialysis units (Holley, 2006; Port et al., 2004; Saran
 3 et al., 2003). Event frequency was rated on a 7-point scale ranging from 1 (*never*)
 4 to 7 (*every day*), with higher scores indicating higher frequencies of adverse events.

5 Two scales of the Hospital Survey on Patient Safety Culture (HSOPS; Sorra & Nieva,
 6 2004) were used to measure patient safety culture in the parent study. The four-item
 7 Handoff and Transitions scale of the HSOPS was used to measure nurses' ratings
 8 of dialysis patient transitions safety during patient shift change. A slight modifica-
 9 tion was made to the wording of each scale item. The wording "when transferred
 10 to another unit" or "shift change" in scale items was replaced with "during patient
 11 shift change" to reflect the time of patient transitions in outpatient hemodialysis
 12 units. Nurses were asked to rate their level of agreement or disagreement with each
 13 item on a scale of 1 (*strongly agree*) to 5 (*strongly disagree*); higher scores indicate
 14 higher ratings of safe patient transitions. Alpha reliability for the scale in this study
 15 was 0.91. Prior to data analysis, total composite scores were dichotomized so that
 16 scores of 3.50 or greater (*disagree* or *strongly disagree* with item) indicated a safe
 17 patient transition rating and composite scores less than 3.50 indicated an unsafe
 18 patient transition rating.

19 The patient safety grade single item rating on the HSOPS (Sorra & Nieva, 2004)
 20 was used to measure nurses' grades for patient safety in their dialysis units. Nurses
 21 were asked to give their dialysis unit an overall grade on patient safety (*A = excellent*,
 22 *B = good*, *C = fair*, *D = poor*, *F = failing*). Prior to data analysis, patient safety grades
 23 were dichotomized so that grades of fair/poor/failing indicated an unfavorable
 24 patient safety rating and grades of excellent/good indicated a favorable patient
 25 safety rating.

26 DATA ANALYSIS

27 Frequency distributions and descriptive statistics of study variables were computed
 28 and examined. A series of 13 unadjusted and adjusted logistic regression models were
 29 estimated to determine the individual and independent effects of patient transition
 30 safety and patient safety grade on the odds of nurses' reporting frequent adverse
 31 patient events. In the unadjusted models, fair to failing patient safety grades and
 32 unsafe handoffs and transitions safety ratings were entered individually. In the adjusted
 33 models, both were entered simultaneously. Good/excellent safety grades and safe
 34 handoff and transitions ratings were used as comparison groups in both unadjusted
 35 and adjusted models. For each adverse event, scores were dichotomized as "seldom"
 36 (never to several times per year) or "frequent" (daily to at least once per month).
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40 RESULTS

41 STAFF NURSE PERCEPTIONS OF SAFETY IN DIALYSIS UNITS

42 S__ Nurse responses to the four items on the Handoffs and Transitions scale reflect
 43 E__ poor patient transition safety ratings by a majority of participants, as shown in
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TABLE 2. Percent of Nurses Who Positively Endorse Patient Transitions Safety and Overall Patient Safety (Safety Grade) in Dialysis Units

Handoffs and Transitions Safety Items	Sample Who Disagreed (Positive Response) With Scale Item (%)
Things fall between the cracks during patient shift change.	28.4
Important patient care information is often lost during patient shift change.	41.7
Patient shift change are often problematic for patients in this dialysis unit.	44.8
Problems often occur in the exchange of information during patient shift changes.	42.4
	Mean composite score (% of sample with positive response)
Overall handoffs and transitions safety	39
Safety Grade	% of Respondents
F (failing)	0.5
D (poor)	1.4
C (fair)	12.2
B (good)	48.4
A (excellent)	37.5
	Mean composite score (% of sample with positive responses)
Overall patient safety	86

Table 2. Moreover, only 39% of nurses positively endorsed safe patient transitions during patient shift change in their dialysis units. On the other hand, 86% of nurses positively graded patient safety in their dialysis unit as either good or excellent.

RELATIONSHIP BETWEEN NURSE-RATED PATIENT TRANSITION SAFETY AND NURSE-REPORTED ADVERSE PATIENT EVENTS

The unadjusted and adjusted odds ratios for the associations between nurses' ratings of unsafe patient transitions during patient shift change, compared to nurses who rated patient transitions as safe, and the 13 adverse events are listed in Table 3. The unadjusted regression models revealed significant associations between nurse reports of unsafe patient transition during patient shift change and an increased likelihood of their reports of frequent occurrences (i.e., daily to once a month) of nine adverse events. When estimating the adjusted effects, controlling for the effect of patient safety grade ratings, nurse reports of unsafe patient transitions, compared to nurses who reported safe patient transitions, was independently associated with an increased likelihood of nurse reports of frequent occurrences of six adverse events,

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TABLE 3. Odds Ratios Associated With Significant Effects of Unsafe Patient Transitions and Poor to Failing Safety Grade on Adverse Events

Adverse Event	Unsafe Patient Transitions		Poor to Failing Patient Safety Grade	
	Unadjusted Model	Model Adjusted for Safety Grade	Unadjusted Model	Model Adjusted for Patient Transition Ratings
Dialysis hypotension	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>
Skipped dialysis treatments	2.36***	1.96**	6.54**	4.65*
Shortened dialysis treatments	2.59***	2.06**	<i>ns</i>	<i>ns</i>
Vascular access infection	1.87**	1.59*	2.52**	2.20**
Vascular access infiltration	1.59*	<i>ns</i>	<i>ns</i>	<i>ns</i>
Vascular access thrombosis	2.16***	2.07***	<i>ns</i>	<i>ns</i>
Bleeding from vascular access	1.77**	1.61*	2.10*	<i>ns</i>
Complaints from patient/family	3.16***	2.72***	4.33***	2.85**
Medication error	2.08*	<i>ns</i>	3.07***	2.72**
Emergency room use	1.77**	<i>ns</i>	2.10*	1.96*
Hospital admission	<i>ns</i>	<i>ns</i>	2.15**	1.82*
Falls without injury	<i>ns</i>	<i>ns</i>	2.92*	<i>ns</i>
Falls with injury	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>

AQ4 * $p < .05$. ** $p < .01$ *** $p < .001$.

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including shortened and skipped dialysis treatments by patients, vascular access thrombosis and infection, unexplained bleeding from the vascular access site, and complaints from patients and their families.

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RELATIONSHIP BETWEEN NURSES' PATIENT SAFETY GRADE AND NURSE-REPORTED ADVERSE PATIENT EVENTS

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The unadjusted and adjusted odds ratios for the associations between nurses' fair to failing patient safety grades for their unit, compared to nurses who graded patient safety as good to excellent, and the 13 adverse events are listed in Table 3. The unadjusted effects of nurses' fair to failing grade for patient safety in their dialysis units were significantly associated with an increased likelihood of their reports of frequent occurrences of eight adverse events. The adjusted effects nurses' fair to failing hemodialysis dialysis unit patient safety grades, controlling for the effects of patient transitions safety, were independently associated with their reports of frequent occurrences of six adverse events, including patient emergency room admissions, hospital admissions, medication errors, skipped dialysis treatments by patients, vascular access infection, and patient and family complaints.

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DISCUSSION

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There is a growing body of evidence that demonstrates the existence of serious health care quality problems for patients undergoing transitions across sites of care such as primary care to specialty care or hospital to subacute care (AHRQ, 2007). However, research in hospital settings has shown that safe patient handoffs and transitions across inpatient units or during staff shift changes within patient units can facilitate positive patient outcomes and the reduction of adverse patient events (Mardon et al., 2010). Patient transition during patient shift change in outpatient hemodialysis units is a unique type of care transition that occurs within a dialysis unit multiple times a day rather than across sites of care. During these periods, a series of essential care processes are performed by nursing staff such as dialysis machine setup, predialysis patient assessment, vascular access cannulation and care, discontinuation of dialysis treatments, and postdialysis patient assessments. These patient transition care processes have a high potential for interruptions of care, miscommunication, and error. Indeed, findings from this study revealed that only 39% of nurses positively endorsed safe patient transitions during patient shift change in their dialysis units. These findings are similar to recent data from 653 U.S. hospitals that revealed only 47% of hospital staff, on average, positively endorsed safe patient handoffs and transitions across hospital units and during staff shift changes (Sorra et al., 2014). Moreover, patient handoffs and transitions were deemed in this report as an area for improvement. Unlike patient handoffs and transitions in hospitals, the findings from this study point to a unique period of patient transition during the patient shift change period in outpatient dialysis units, and nurses' ratings of safety during this period indicate a particular aspect of safety culture in outpatient dialysis units that warrants attention.

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1 There was a striking difference in nurses' perceptions of safety during the specific
 2 period of patient transitions in their dialysis units compared to their overall percep-
 3 tions of safety policies, procedures, and practices in their workplace, as reflected in
 4 their safety grade ratings. Specifically, in contrast to the low percentage of nurses
 5 who reported safe patient transitions in their dialysis units, 86% of nurses graded
 6 overall patient safety in their dialysis units as good or excellent. These differences
 7 in staff perceptions of particular aspects of patient safety in the workplace also
 8 exist in acute care hospital settings. Recent data from the AHRQ 2014 compara-
 9 tive database of 653 U.S. hospitals reveal that, although only 47% of hospital staff
 10 positively endorse safe handoffs and transitions, 76% of staff grade overall safety in
 11 their workplace as excellent or very good (Sorra et al., 2014). Thus, research find-
 12 ings in both inpatient and outpatient health care settings underscore the multid-
 13 dimensional nature of safety culture and need for broad safety assessments because
 14 some aspects of safety can be very good or excellent whereas other aspects may
 15 require attention and improvement.

16 Nurses' negative ratings of patient safety culture in this study, that is, unsafe
 17 patient transitions and fair to failing safety grades, were independently associated
 18 with their reports of frequent adverse patient events in the adjusted regression
 19 models (Table 3). Specifically, compared to nurses who endorsed safe patient transi-
 20 tions during patient shift change in dialysis units, nurses' ratings of unsafe patient
 21 transitions were independently associated with nurse reports of frequent occur-
 22 rences (i.e., daily to monthly) adverse patient events assessed in this study. These
 23 findings are consistent with hospital-based research that reveals an independent
 24 association between positive ratings by staff of patient handoffs in hospitals and
 25 positive patient assessments of the quality of their inpatient care (Sorra, Khanna,
 26 Dyer, Mardon, & Famolaro, 2012). Likewise, an analysis of data from 179 U.S. hos-
 27 pitals revealed that positive ratings of patient handoffs and transitions by hospital
 28 staff were independently associated with lower rates of inpatient complication and
 29 adverse events (Mardon et al., 2010).

30 Fair to failing patient safety grades by nurses were also independently associated
 31 with multiple adverse patient events in this study. Similarly, hospital-based research
 32 revealed fair to failing safety grades were significantly related to patient complica-
 33 tions and other adverse events (Mardon et al., 2010). The significant association
 34 between negative patient safety grades by nurses and the increased likelihood of
 35 their reports of adverse patient events in this study may reflect system issues such
 36 as inappropriate levels of staffing, a lack of procedural guidance, staff training,
 37 patient education procedures, or policy enforcement.

39 **IMPLICATIONS FOR CLINICAL PRACTICE AND FUTURE RESEARCH**

40 Safety culture in the workplace reflects the way in which safety is managed. It also
 41 signals the attitudes, beliefs, values, and perceptions that employees share about
 42 the way "safety is done" in their job settings. The goal of patient safety culture in
 43 health care organizations is to lessen harm to patients and providers of care through
 44 S___ system effectiveness and individual performance. The findings from this study
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indicate that outpatient dialysis units present potential threats to patient safety. The patient transition period during patient shift changes may be a starting point for improving patient safety culture in these settings. Specifically, there is a need to identify and improve high-risk and inefficient care processes during patient shift change. For example, a patient transition strategy of staggering the start of individual dialysis treatments in dialysis centers to limit the number of patients initiating and terminating therapy at one time may reduce distractions and facilitate safe care during the patient transition period (Holley, 2010). Also, dialysis unit *elasticity or slack* staffing models that accommodate variations in patient volume and workload that are typical during peak patient transition periods in dialysis units may assist in fostering safe care processes, minimizing error, and reducing adverse patient events during this time (IOM, 2004).

This study examined only two dimensions of patient safety culture in outpatient dialysis settings, and little is known of extent to which dialysis units foster other aspects of safety culture. AHRQ (2012) notes the following as key features of patient safety culture in health care organizations: (a) acknowledgement of the high-risk nature of their activities, (b) a determination to achieve safe operations, (c) an environment that is blame-free where individuals can report errors or near misses without fear of punishment, (d) collaboration across ranks and disciplines to find solutions to patient safety problems, and (e) a commitment of resources to address safety concerns. Crucial among these is the premise that a *safe* organization is not error-free (Garrick, Klinger, & Stefanchik, 2012). It is inevitable that people will make mistakes or some adverse events are likely to occur. In a culture of safety, a balance is achieved between not blaming individuals for errors and not tolerating egregious behaviors. In outpatient dialysis units and other ambulatory care settings, a strong safety culture should include individual peer review and accountability as well as root cause analyses to discover system and process issues that contribute to unsafe care processes and adverse events (Garrick et al., 2012). In addition, a promotion of safety culture through staff and patient education and training and a strong committed leadership is essential.

AHRQ (2013) recommends annual assessments of safety culture as 1 of its 10 top safety tips for hospitals. However, research is needed to develop valid and reliable safety culture assessment measures that are tailored for use in diverse ambulatory care settings. These tools can provide a basis for routine assessments of patient safety culture in ambulatory care to raise staff awareness about patient safety culture, assess the current state of patient safety culture, identify strengths and areas for improvement, examine trends in safety culture over time, and evaluate the impact of safety culture initiatives and interventions. The routine assessment of patient safety culture in outpatient dialysis and other ambulatory care settings may be a critical first step in efforts to identify threats to patient safety and improve the outcomes of patients who receive care in outpatient facilities that provide high-risk care. Finally, little is known regarding the full scope of patient safety culture in dialysis units and other ambulatory care settings such as ambulatory surgical centers and outpatient infusion centers. Further research is needed to address these gaps in knowledge.

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LIMITATIONS

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The occurrence of adverse events in this study was reported by nurses. Although research has shown that nurses are reliable informants regarding patient outcomes (Aiken et al., 2001; Sochalski, 2004; Thomas-Hawkins et al., 2008), research that aggregates patient safety assessments by staff to the facility level and links these assessments to actual facility-level patient outcomes is needed. In addition, the parent study sample was drawn from RNs who were members of a professional organization, the American Nephrology Nurses' Association (ANNA). Therefore, the staff nurse sample in this study may not be representative of staff nurses who work in outpatient hemodialysis units because, as ANNA members, they may possess characteristics that differ uniquely and significantly from nurses work in hemodialysis units and are not members of this organization.

CONCLUSION

Little is known about the state of patient safety in ambulatory care settings such as outpatient dialysis units. Findings from this study suggest that, similar to inpatient hospital settings, a positive patient safety culture in ambulatory care is likely associated with lower adverse patient events. However, there is a crucial need for the development of valid and reliable measures of patient safety culture that are tailored to diverse ambulatory care centers. There is also a need for research in ambulatory care that links safety cultures with the outcomes of patients who receive care in these settings. The findings from patient safety research in ambulatory care will provide research-based evidence to build or expand a culture of patient safety in outpatient settings and, ultimately, to improve patient outcomes.

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9
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