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Psychometric Properties of the AHRQ Community Pharmacy Survey on Patient Safety Culture: A Factor Analysis

Ephrem A. Aboneh^{1,2}, Kevin Look¹, Jamie Stone^{1,2}, Corey Lester^{1,2}, and Michelle A. Chui^{1,2}

¹University of Wisconsin – Madison, Social & Administrative Sciences Division, Madison, Wisconsin, USA

²Systems Approach to Medication Safety Research Laboratory, Madison, Wisconsin, USA

Abstract

Background—The U.S. Agency for Healthcare Research and Quality (AHRQ) developed a hospital patient safety culture survey in 2004, and has adapted this survey to other healthcare settings, such as nursing homes and medical offices, and most recently community pharmacies. However, it is unknown if safety culture dimensions developed in hospital settings can be transferred to community pharmacies. The aim of this study was to assess the psychometric properties of the Community Pharmacy Survey on Patient Safety Culture.

Method—The survey was administered to 543 community pharmacists in [state], United States. Confirmatory factor analysis was used to assess the fit of our data with the proposed AHRQ model. Exploratory factor analysis was used to determine the underlying factor structure. Internal consistency reliabilities were calculated.

Results—A total of 433 usable surveys were returned (response rate of 80%). Results from the confirmatory factor analysis showed inadequate model fit for the original 36 item, 11-factor structure. Exploratory factor analysis showed that a modified 27 item, 4-factor structure better reflected the underlying safety culture dimensions in community pharmacies. The communication openness factor, with 3 items, dropped in its entirety while 6 items dropped from multiple factors. The remaining 27 items redistributed to form the 4-factor structure: safety related communication, staff training and work environment, organizational response to safety events, and staffing, work pressure and pace. Cronbach's α of 0.95 suggested good internal consistency.

Conclusion—Dimensions related to safety culture in a community pharmacy environment may differ from those in other healthcare settings such as in hospitals. Our findings suggest that validation studies need to be conducted before applying safety dimensions from other healthcare settings into community pharmacies.

Correspondence to: Dr. Michelle A. Chui, Social & Administrative Sciences Division, Systems Approach to Medication Safety Research Laboratory, University of Wisconsin – Madison, 2511 Rennebohm Hall, Madison, WI 53705, USA; michelle.chui@wisc.edu.

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Keywords

safety culture; community pharmacy; medication safety

Background

The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management.¹ Safety culture has been conceptualized to have three aspects: the psychological aspects that relate to “how people feel” (also known as safety climate), the behavioral aspects that related to “what people do”, and the situational aspects that relate to “what the organization has.”² If healthcare organizations are to improve patient safety, it is necessary for them to learn about their current patient safety culture. In recent years, there has been an increasing trend in developing and validating instruments to measure safety culture in a variety of healthcare settings. The U.S. Agency for Healthcare Research and Quality (AHRQ), for example, has sponsored the development of several patient safety culture surveys applicable to different healthcare settings. The first survey was developed to be used in U.S hospitals,³ which was later validated or modified for use in other countries' health systems or languages.^{4–14} Following this, the AHRQ also released the Medical Office¹⁵ and the Nursing Home¹⁶ versions of its patient safety culture survey.

Despite their key role in ensuring the safe use of medications and overall patient safety, community pharmacies have traditionally been excluded from the realm of research measuring safety culture in healthcare organizations. Such pharmacies generally operate outside of hospitals and have a primary function of medication dispensing and patient counseling after the receipt of a prescription from an authorized prescriber. The AHRQ's most recent addition to its group of safety culture surveys, the Community Pharmacy Survey on Patient Safety Culture (formerly known as the Pharmacy Survey on Patient Safety Culture), aimed to fill the gap in safety culture assessment in community pharmacies.¹⁷ The survey was designed to measure the culture of patient safety in community pharmacies, and contains 36 items measuring 11 factors of patient safety culture, many of which are similar to those measured in the original hospital survey.

The AHRQ conducted a pilot study using a sample of pharmacy staff working in 55 community pharmacies located in different geographic regions of the U.S.¹⁸ Apart from publishing reliability statistics (Cronbach's α values) for each of the 11 safety culture factors, little detailed information is available regarding the psychometric properties of the survey instrument itself.¹⁹ Furthermore, it is unknown whether any type of factor analysis was conducted to determine the optimal numbers of factors that should be used to measure patient safety culture in a community pharmacy setting. It is also unclear if the dimensions of patient safety culture developed for a hospital setting appropriately reflect patient safety culture in a community pharmacy setting.³

Thus, the objective of this study was to confirm the factor structure of the AHRQ Community Pharmacy Survey on Patient Safety Culture in a sample of [state] community

pharmacists and, if necessary, identify an alternative factor structure that better reflects the specific characteristics of patient care delivery in a community pharmacy setting.

Methods

Design and study population

A cross-sectional study design was used to collect data from pharmacists practicing in [state] (U.S.) community pharmacies. A list of 1,725 licensed pharmacists who had addresses in [state] and opted to share contact information was obtained from the [state] Department of Safety and Professional Services. This list included pharmacists working in a variety of practice settings such as hospitals, nursing homes, and community pharmacies. However, because our sample only included community pharmacists who have practiced for the past 12 months, a screening questionnaire was sent to a random sample of 1,000 pharmacists' home addresses in January 2013. Since the return was not adequate, a second mailing of screener questionnaires was sent to the remaining 725 pharmacists. A total of 934 (54%) licensed pharmacists responded to the screener questionnaire; of these, 543 indicated that they were community pharmacists and represented the sampling frame for the study.

Up to four attempts were used to contact eligible participants. In the first wave, participants were sent a packet containing the Community Pharmacy Survey on Patient Safety Culture, a cover letter, a \$2 bill, and a postage-paid return envelope. In the second wave, a postcard reminder was sent to all sampled participants. In the third and fourth waves, pharmacists who had not returned the survey were sent the survey and postage-paid return envelopes without the incentive. All survey mailings occurred between April and June of 2013.

In addition to the Community Pharmacy Survey on Patient Safety Culture, the survey contained additional questions related to characteristics of the respondents and their practice sites. Participant information included pharmacist age, gender, and work experience in their current pharmacy. Characteristics of the practice site included type of pharmacy, daily prescription volume, and pharmacy location. This project received human subjects approval by the [Research Institution] Institutional Review Board.

Data analysis

Negatively worded items were reverse coded such that a higher score meant a more positive response to the question.¹⁸ The percentage of missing values was less than 1% for all items except two that had close to 6% (i.e., When the same mistake keeps happening, we change the way we do things; Staff feel like their mistakes are held against them). Missing values were replaced using the mean score for that item. We then conducted a confirmatory factor analysis using Mplus Version 7.3 (Muthen & Muthen, Los Angeles, California, USA) to assess the degree of fit of our data with the AHRQ's proposed 11-factor model. The fit indices provide summary information about the discrepancy between the observed values and those that are expected under the model being tested.

We then conducted an exploratory factor analysis to determine the underlying factor structure of our data. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were calculated to determine the appropriateness of conducting

factor analysis. A KMO coefficient less than 0.5 is considered unacceptable; values around 0.6 are considered mediocre and those above 0.9 are deemed exceptional.²⁰ A highly significant p-value ($p < 0.001$) for Bartlett's test indicates an appropriate dataset for factor analysis. Exploratory factor analysis was conducted using Stata 13 (Stata Corp, College Station, Texas, USA).

To determine the underlying factor structure of the Community Pharmacy Survey on Patient Safety Culture in our sample, a principal components analysis was first conducted to reduce the number of items. Parallel analysis was then used to determine the optimal number of components to retain.^{21,22} In parallel analysis, the number of components to retain is equal to the number of observed study eigenvalues that exceed the eigenvalues obtained by running a principal components analysis on multiple ($n=1,000$ in this study) randomly generated data sets with the same characteristics as the study data set.^{22,23} An oblique rotation was then performed to determine which items loaded most highly on which factor. Using a conservative approach, an item was considered to have sufficient contribution to the particular factor if its loading was 0.4 or higher.²⁴ Items with low factor loadings (< 0.4) or cross-loading on multiple factors (> 0.3) were removed. Finally, factor analysis was conducted on the subset of retained items. We used the principal factors method for factor extraction and applied an oblique rotation (Promax, in Stata). Internal consistency reliabilities were calculated using Cronbach's α for the overall item set and for each set of subscale items.

Results

Summary Statistics

Of the 543 mailed survey invitations to community pharmacists in our sampling frame and met the inclusion criteria, 445 completed surveys were returned, yielding 433 usable responses for a response rate of 80%. Table 1 shows the characteristics of surveyed pharmacists and their pharmacies. Nearly 60% of the participants were males and mean age was 49 years. Mean work experience in the current pharmacy was 9 years. About half of the pharmacies were national chain, mass merchandise, or grocery store pharmacies, while approximately one-third were independent pharmacies. Only 6% of the pharmacies in our study were open 24 hours, and 66% were located in urban areas. The mean prescription volume per weekday was 312.

The distribution of responses to each question from the original AHRQ Community Pharmacy Survey on Patient Safety Culture in our sample is shown in Table 2. Mean scores range from 2.73 to 4.63 on the 1-5 Likert type scale. The values of the KMO coefficient (0.952) and Bartlett's test of sphericity ($\chi^2(630)=9513.157$, $p < 0.001$) indicated that factor analysis was appropriate for our data.

Confirmatory Factor Analysis

We conducted a confirmatory factor analysis to determine if our data fit the proposed 11-factor model proposed by the AHRQ. We assessed model fit using the χ^2 test, comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean-squared error of approximation

(RMSEA). We used the following criteria to examine model fit: a significant X^2 value indicating poor model fit; CFI and TLI values >0.95 representing a good fit; and a RMSEA value <0.06 indicating good fit.^{25,26} Our analysis of the 11-factor model had the following fit indices: $X^2=1883.94$, $df=583$, $p=0.000$; CFI=0.938; TLI=0.934; RMSEA=0.072. Therefore, the 11-factor suggested by the AHRQ did not meet the criteria for acceptable overall model fit; thus, we reject the hypothesis that the specified model fits the data.

Exploratory Factor Analysis

Based on the confirmatory factor analysis results, we conducted an exploratory factor analysis to identify the underlying factor structure that best reflects the specific characteristics of patient care delivery in a community pharmacy setting. The eigenvalues shown in Figure 1 and the scree plot in Figure 2 indicated a four factor structure. Table 3 shows factor loadings for the 27-item, 4-factor solution that emerged with an overall Cronbach's α of 0.95. These items collectively accounted for 57% of the variance in the responses. Nine items were removed from the original set of 36 items due to low factor loadings (<0.4) or high cross-loadings (>0.3). The internal consistency of the four factors is above the acceptable level of 0.7.

The four-factor model that emerged as the strongest model in the factor analysis was considerably different from those proposed by the AHRQ pilot survey. The “communication openness” factor (three items) was entirely absent in the revised factor structure. The factors “patient counseling”, “organizational learning-continuous improvement”, and “overall perceptions of patient safety” all dropped a single item. The remaining two items from the “patient counseling” factor combined with those under “communication about prescriptions across shifts” and “communication about mistakes” to form a single factor containing 8 items labeled “*Safety related communication*” ($\alpha=0.88$). All but two items within the factors of “physical space and environment”, “teamwork”, and “staff training and skills” combined to create a new factor containing 8 items labeled “*Staff training and work environment*” ($\alpha=0.89$). Two of the remaining items from each of the factors of “organizational learning-continuous improvement” and “overall perceptions of patient safety” merged with items from the “response to mistakes” factor to create a new factor containing 8 items labeled “*Organizational response to safety events*” ($\alpha=0.90$). The final factor labeled “*Staffing, work pressure, and pace*”, formed as in the AHRQ pilot survey but dropped one item ($\alpha=0.81$).

Table 4 shows the intercorrelations between the factors, which range from 0.49 to 0.58 and support the assumption that the factors are not independent from each other. Importantly, the correlation coefficients are not high enough (>0.8) to indicate multicollinearity.

Discussion

Results of our confirmatory factor analysis indicate that the original proposed model is not reflective of a community pharmacy setting. This is consistent with studies that have evaluated the psychometric properties of the hospital version of the AHRQ survey using data from other countries that have shown that safety culture dimensions relevant in U.S hospitals may not necessarily apply in non-U.S. healthcare settings. For example, a study by Waterson *et al.*¹³ evaluating the psychometric properties of the AHRQ's Hospital Survey on Patient

Safety Culture using data from U.K. hospitals showed that the original 12-factor model proposed by the AHRQ did not satisfactorily fit the U.K data. Authors of this study reported that a 9-factor solution was a better fit for their data. The authors also argued that quick generalizations on applications of safety culture dimensions across healthcare settings might be misleading, as practice settings vary considerably with regards to norms and operating procedures of institutions. In the same vein, safety culture dimensions developed for hospital settings may not necessarily translate to community pharmacy environments.

Consequently, we conducted an exploratory factor analysis to determine if it is possible to construct factors that can better identify the relevant safety culture dimensions in a community pharmacy setting. Once poorly performing items were removed, we obtained a four-factor structure consisting of 27 items, which is a considerable departure from the original model proposed by the AHRQ.

The first factor, which we labeled “*Safety related communication*”, addressed communication among pharmacy staff as well as between pharmacists and their patients for the purposes of providing safe care. This suggests that pharmacists may conceptualize all types of communication as one key safety construct. Healthcare workers in hospitals come from diverse professional backgrounds, each with different roles, responsibilities, and communication types that often tend to be standardized. For example, the act of communication during a clinical handover is taught in schools with established acronyms that are meant to standardize the process.²⁷ In addition, error reporting tends to be more structured in hospitals. In comparison, the community pharmacy setting lacks such formal structures in place, and if they do, they are still in their infancy.²⁸

Factor 2, “*Staff training and work environment*”, included 8 items related to organizational support such as teamwork and understanding of staff roles and responsibilities, proper staff training, as well as the work environment of the pharmacy. Pharmacists may have a different understanding of some of the underlying concepts such as “teamwork” in a pharmacy environment as opposed to the relatively well delineated functions of different healthcare professionals in a hospital setting.²⁹ In general, roles are less defined in a community pharmacy environment and there tends to be a lot of overlap between pharmacist and technician tasks, with the exception that pharmacists are solely responsible for final prescription review and patient counseling. Staff training in community pharmacies also tends to be more informal “on the job” training compared to an inpatient setting, where newly hired individuals are enrolled in a more structured training and mentoring program within their clinical unit. These combined items may be a reflection of leadership as it relates to personnel management, including training new hires, having clear expectations for staff, and respectful teamwork.

The third factor, “*Organizational response to safety events*”, contained 8 items related to the response of pharmacy management to safety-related events such as making mistakes. All of the items contained in this factor are related to the prevention of or response to mistakes. This could be a reflection of the limited awareness among community pharmacists about organizational safety science and the roles their organizations play in addressing safety incidents. On the other hand, such issues have long been a focus in hospital settings, in part

due to the release of the 1999 Institute of Medicine's "*To Err Is Human*" report in the U.S.³⁰ For example, it is common for U.S. hospitals to operate departments focused on quality and safety, whose main objectives are to ensure that patient safety and quality of care are improved while emphasizing many of the safety culture constructs measured in the hospital version of the AHRQ survey.

Factor 4, "*Staffing, work pressure and pace*", contained 3 items and formed in the same fashion as was proposed in the AHRQ pilot survey, with only one item dropping due to poor factor loading ("staff take adequate breaks during shifts"). This factor addressed issues related to adequacy of staff to do the job and the associated cognitive and physical overload on pharmacists. Items in this factor very clearly capture a distinct patient safety concern that many pharmacists recognize as a key determinant of patient safety. Indeed, the mean scores for items in this factor were the lowest compared to the other factors, which is consistent with other studies that correlate workload to patient safety.^{31,32}

With the exception of factor 4, "*Staffing, work pressure and pace*", the first three factors contained items that were spread across multiple factors of the original proposal per AHRQ's pilot survey findings. One possible explanation for this discrepancy is that the concept of safety culture in a community pharmacy setting is still in its infancy and there exists little or no appreciation of many of the underlying dimensions that underlie safety culture in community pharmacies. Alternatively, developers of the pilot survey may not have fully recognized the unique context in which healthcare is provided in community pharmacies, such that adaptations of other previously developed surveys could have been incorporated. Another explanation might be that safety culture dimensions that were studied and validated in a hospital setting may not necessarily apply in a community pharmacy environment. Further work is needed to explore community pharmacists' perceptions about the concepts addressed in the survey.

Although the CPSPSC survey title indicates measurement of "safety culture" which encompasses psychological, behavioral, and situational aspects², the four factors we identified may better represent only the psychological aspects, or the construct of "safety climate" which is concerned with individual and group values, attitudes, and perceptions. A recent study by Phipps et al.³³ using a sample of pharmacy staff across five European countries found that pharmacy safety climate has four factors, including *organizational learning*; pharmacy's propensity to allocate *blame* to individuals when a problem or an incident occurs; *working conditions* that are conducive to work safely; and level of *safety focus*.³³ Although our results resemble the safety climate factors identified in the Phipps et al.³³ study, we used the term "safety culture" throughout the paper for consistency.

This study has several limitations, and key differences between the AHRQ sample and ours are worth discussing. The AHRQ pilot study was administered to a convenience sample of 479 pharmacy staff (including pharmacists, technicians, clerks, student interns, and other pharmacy staff) in 55 pharmacies who self-selected for the study and were located in 25 states in the United States. Although the sample was restricted to pharmacies that had responses from at least 5 pharmacy staff (average: 9 respondents per pharmacy; range: 5 to 20), it is unknown whether the results were adjusted to account for response clustering at the

pharmacy level. In addition, the AHRQ survey overrepresented mass merchandise and grocery store pharmacies, and underrepresented independent and chain pharmacies.³⁴

In contrast, our survey was administered only to pharmacists with addresses in the state of [state], representing a larger diversity of pharmacy types and locations but covering a smaller geographic area. We recognize that safety culture is an organizational phenomenon and, thus, a product of the views, perceptions, and attitudes of all members of the community pharmacy. Our sampling decision limiting study participants only to pharmacists reduces the generalizability of our findings. It was not possible to locate pharmacy technicians as there is no registered list for them in the state. Furthermore, our study was also limited to pharmacists in one state in the U.S.

Further, we do not know how the original 11-factor structure from the AHRQ directly compares to our newly proposed 4-factor structure. The next step in this research is to confirm the factor structure using a larger national sample of community pharmacy staff.

Conclusion

This study represents the first attempt to assess the psychometric properties of the AHRQ Community Pharmacy Survey on Patient Safety Culture using a cohort of practicing community pharmacists in the United States. We found that factors related to safety culture in a community pharmacy environment may differ from those in other healthcare settings such as in hospitals. Our findings suggest that caution should be used when applying concepts developed in other healthcare settings to that of a community pharmacy environment, and validation studies should be conducted. That said, we believe that this study is an important step to further develop the conceptualization and measurement of safety culture in an understudied but vital healthcare setting.

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PA -- Parallel Analysis for Principal Components -- N = 433
 PA Eigenvalues Averaged Over 1000 Replications

	PCA	PA	Dif
1.	14.74822	1.589476	13.15874
2.	2.096956	1.515888	.5810676
3.	1.720065	1.46253	.2575349
4.	1.597626	1.416402	.1812245
5.	1.265325	1.374032	-.1087061
6.	1.086591	1.336323	-.249732
7.	1.050972	1.300565	-.2495923
8.	.8608296	1.266622	-.4057924
9.	.8540673	1.233294	-.3792273
10.	.7525492	1.202295	-.4497462
11.	.6753461	1.172958	-.4976117
12.	.642114	1.143982	-.5018677
13.	.6198159	1.116547	-.4967307
14.	.5941571	1.089295	-.4951375
15.	.5529323	1.062892	-.50996
16.	.5219439	1.037125	-.5151813
17.	.4789839	1.011721	-.5327367
18.	.4699797	.9875892	-.5176095
19.	.4543665	.9636412	-.5092747
20.	.4419635	.9379171	-.4959536
21.	.3980949	.9140259	-.515931
22.	.3953778	.8907056	-.4953278
23.	.3528841	.8661451	-.513261
24.	.3482282	.8438982	-.49567
25.	.3422531	.8208987	-.4786456
26.	.3067163	.7979026	-.4911864
27.	.3002131	.7750056	-.4747926
28.	.286463	.7521334	-.4656704
29.	.2656646	.7282614	-.4625967
30.	.2598071	.7051948	-.4453877
31.	.2423436	.6814384	-.4390947
32.	.2288129	.6568435	-.4280306
33.	.2197789	.6317165	-.4119376
34.	.2089874	.6038178	-.3948304
35.	.1970475	.5742566	-.3772091
36.	.1625234	.5366626	-.3741392

Figure 1.

Parallel analysis of principal components. Note: PCA=principal components analysis;
 PA=parallel analysis; dif=diff=

Figure 2. Scree plot of the parallel analysis results of the original 36 items. Note: PCA=principal components analysis; PA=parallel analysis

Table 1
Characteristics of surveyed pharmacies and pharmacists (n=433)

Variables	Percentages
Pharmacy type	
National chain/Mass merchandizer/Grocer	52
Independent	30
HMO/Clinic	18
24 Hour Pharmacy	
Yes	6
No	94
Prescription volume per week day	<i>312 (299)*</i>
Pharmacy setting	
Rural	34
Urban	66
Gender	
Male	60
Female	40
Age	<i>49 (14)*</i>
Tenure in current pharmacy	<i>9 (9)*</i>
Pharmacist position	
Staff/Managing Pharmacist	76
Float/Relief Pharmacist	20
Other	4

* Mean (standard deviation) for continuous variables

HMO: Health Maintenance Organization

Table 2
Descriptive statistics of safety culture items

Original AHRQ survey factors and questions	Mean	SD
Original factor 1: Patient counseling		
We encourage patients to talk to pharmacists about their medications (B2)	4.61	0.65
Our pharmacists spend enough time talking to patients about how to use their medications (B7) *	4.13	0.80
Our pharmacists tell patients important information about their new prescriptions (B11)	4.58	0.61
Original factor 2: Communication Openness		
Staff ideas and suggestions are valued in this pharmacy (B1) *	3.84	0.90
Staff feel comfortable asking questions when they are unsure about something (B5) *	4.35	0.68
It is easy for staff to speak up to their supervisor/ manager about patient safety concerns in this pharmacy (B10) *	3.98	1.03
Original factor 3: Overall Perceptions of Patient Safety		
This pharmacy places more emphasis on sales than on patient safety (C3R) *	3.74	1.14
This pharmacy is good at preventing mistakes (C6)	3.95	0.81
The way we do things in this pharmacy reflects a strong focus on patient safety (C9)	4.00	0.89
Original factor 4: Organizational Learning-Continuous Improvement		
When a mistake happens, we try to figure out what problems in the work process led to the mistake (C2) *	4.12	0.89
When the same mistake keeps happening, we change the way we do things (C5)	4.00	0.89
Mistakes have led to positive changes in this pharmacy (C10)	3.79	0.84
Original factor 5: Teamwork		
Staff treat each other with respect (A2)	4.21	0.81
Staff in this pharmacy clearly understand their roles and responsibilities (A4)	4.10	0.84
Staff work together as an effective team (A9)	4.10	0.82
Original factor 6: Communication About Prescriptions Across Shifts		
We have clear expectations about exchanging important prescription information across shifts (B4)	3.97	0.78
We have standard procedures for communicating prescription information across shifts (B6)	3.63	1.09
The status of problematic prescriptions is well communicated across shifts (B14)	3.92	0.74
Original factor 7: Communication About Mistakes		
Staff in this pharmacy discuss mistakes (B8)	4.00	0.95
When patient safety issues occur in this pharmacy, staff discuss them (B13)	4.03	1.00
In this pharmacy, we talk about ways to prevent mistakes from happening again (B15)	3.91	1.01
Original factor 8: Response to Mistakes		
Staff are treated fairly when they make mistakes (C1)	4.14	0.78
This pharmacy helps staff learn from their mistakes rather than punishing them (C4)	4.02	0.93
We look at staff actions <u>and</u> the way we do things to understand why mistakes happen in this pharmacy (C7)	3.96	0.88
Staff feel like their mistakes are held against them (C8R)	3.72	0.99
Original factor 9: Staff Training and Skills		
Technicians in this pharmacy receive the training they need to do their jobs (A3)	3.88	0.96
Staff in this pharmacy have the skills they need to do their jobs well (A6)	4.07	0.83

Original AHRQ survey factors and questions	Mean	SD
Staff who are new to this pharmacy receive adequate orientation (A8)	3.50	1.05
Staff get enough training from this pharmacy (A10)	3.71	0.99
Original factor 10: Physical Space and Environment		
This pharmacy is well organized (A1)	4.23	0.86
This pharmacy is free of clutter (A5) *	3.61	1.05
The physical layout of this pharmacy supports good workflow (A7) *	3.67	1.10
Original factor 11: Staffing, Work Pressure, & Pace		
Staff take adequate breaks during their shifts (B3) *	3.35	1.12
We feel rushed when processing prescriptions (B9R)	2.73	0.81
We have enough staff to handle the workload (B12)	3.67	0.90
Interruptions/distractions in this pharmacy (from phone calls, faxes, customers, etc.) make it difficult for staff to work accurately (B16R)	2.95	0.76

* Indicates item dropped following exploratory factor analysis.

Item's original AHRQ survey location indicated after each question. Means represent average values of participant responses (range: 1 to 5). SD, standard deviation.

Table 3
Safety culture survey items retained in 4-factor solution

Factor 1: Safety Related Communication (Cronbach's $\alpha=0.88$)	Factor 1	Factor 2	Factor 3	Factor 4
We encourage patients to talk to pharmacists about their medications (B2)	0.4347			
We have clear expectations about exchanging important prescription information across shifts (B4)	0.7207			
We have standard procedures for communicating prescription information across shifts (B6)	0.6773			
Staff in this pharmacy discuss mistakes (B8)	0.6679			
Our pharmacists tell patients important information about their new prescriptions (B11)	0.4598			
When patient safety issues occur in this pharmacy, staff discuss them (B13)	0.6710			
The status of problematic prescriptions is well communicated across shifts (B14)	0.6833			
In this pharmacy, we talk about ways to prevent mistakes from happening again (B15)	0.7452			
Factor 2: Staff Training and Work Environment (Cronbach's $\alpha=0.89$)				
This pharmacy is well organized (A1)		0.5900		
Staff treat each other with respect (A2)		0.6394		
Technicians in this pharmacy receive the training they need to do their jobs (A3)		0.7378		
Staff in this pharmacy clearly understand their roles and responsibilities (A4)		0.7342		
Staff in this pharmacy have the skills they need to do their jobs well (A6)		0.6865		
Staff who are new to this pharmacy receive adequate orientation (A8)		0.5246		
Staff work together as an effective team (A9)		0.6623		
Staff get enough training from this pharmacy (A10)		0.6918		
Factor 3: Organizational Response to Safety Events (Cronbach's $\alpha=0.90$)				
Staff are treated fairly when they make mistakes (C1)			0.7012	
This pharmacy helps staff learn from their mistakes rather than punishing them (C4)			0.8492	
When the same mistake keeps happening, we change the way we do things (C5)			0.5567	
This pharmacy is good at preventing mistakes (C6)			0.4193	
We look at staff actions and the way we do things to understand why mistakes happen in this pharmacy (C7)			0.5990	
Staff feel like their mistakes are held against them (C8R)			0.6287	
The way we do things in this pharmacy reflects a strong focus on patient safety (C9)			0.4921	
Mistakes have led to positive changes in this pharmacy (C10)			0.5717	
Factor 4: Staffing, Work Pressure and Pace (Cronbach's $\alpha=0.81$)				
We feel rushed when processing prescriptions (B9R)				0.7549
We have enough staff to handle the workload (B12)				0.6861
Interruptions/distractions in this pharmacy (from phone calls, faxes, customers, etc.) make it difficult for staff to work accurately (B16R)				0.6108

Table 4
Intercorrelations of the factors

Factor	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1: Safety Related Communication	1			
Factor 2: Staff Training and Work Environment	0.55	1		
Factor 3: Organizational Response to Safety Events	0.58	0.57	1	
Factor 4: Staffing, Work Pressure and Pace	0.54	0.53	0.49	1