What constitutes patient safety culture in Chinese hospitals?

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Abstract

Objective. To develop a patient safety culture instrument for use in Chinese hospitals, we assessed the appropriateness of existing safety culture questionnaires used in the USA and Japan for Chinese respondents and identified new items and domains suitable to Chinese hospitals.

Design. Focus group study.

Setting and participants. Twenty-four physicians, nurses and other health-care workers from 11 hospitals in three Chinese cities.

Methods. Three focus groups were conducted in 2010 to elicit information from hospital workers about their perceptions of the appropriateness and importance of each of 97 questionnaire items, derived from a literature review and an expert panel, characterizing hospital safety culture.

Results. Participants understood the concepts of patient safety and safety culture and identified features associated with safe care. They judged that numerous questions from existing surveys were inappropriate, including 39 items that were dropped because they were judged unimportant, semantically redundant, confusing, ambiguous or inapplicable in Chinese settings. Participants endorsed eight new items and three additional dimensions addressing staff training, mentoring of new hires, compliance with rules and procedures, equipment availability and leadership walk-rounds they judged appropriate to assessing safety culture in Chinese hospitals. This process resulted in a 66-item instrument for testing in cognitive interviews, the next stage of survey development.

Conclusions. Focus group participants provided important insights into the refinement of existing items and the construction of new items for measuring patient safety culture in Chinese hospitals. This is a necessary first step in producing a culturally appropriate instrument applicable to specific local contexts.

Keywords: patient safety, quality culture, focus groups, China, hospital

Introduction

Patient safety in hospitals is of global concern. Numerous studies have documented detrimental effects on patients and their families and increased health-care costs resulting from medical errors [1–6]. No large empirical studies have demonstrated the severity or extent of medical errors in China; nevertheless, the Chinese Hospital Association (CHA) estimated that adverse events affect 1.6–7.6 million hospitalizations annually in Chinese hospitals [7].

In response to the problem, the CHA has promulgated annual patient safety goals since 2007 [7], and the Ministry of Health established a web-based voluntary adverse event reporting system in 2008 [8]. Theory suggests that an organizational culture that supports safety is associated with fewer errors and more voluntary reporting because those organizations promote a blame-free environment where errors are treated as opportunities to learn and improve the system [9, 10]. In fact, empirical studies have identified a positive link between better safety culture and fewer errors or better outcomes [11–13]. Therefore, for organizations and countries without direct measures of medical errors or adverse events, culture change may serve as a surrogate ‘outcome measure’ for assessing the effectiveness of patient safety interventions. However, currently available instruments which have largely been developed in the USA may not accurately reflect
the character of and conditions in the Chinese health-care system. A recent study in Taiwan used a Chinese translation of the Hospital Survey on Patient Safety Culture (HSOPSC) questionnaire developed in the USA. The internal consistency of the Taiwan data was lower than that of the US data from 382 hospitals participating in the HSOPSC in 2007, and several indices did not support a good model fit in confirmatory factor analysis [14]. The authors concluded that the survey instrument developed in the US cultural context was not directly translatable or fully useful in assessing safety culture in Taiwan [14].

The goals of this research are to create and test a patient safety culture questionnaire for health-care workers in Chinese hospitals and to develop a method for producing culturally appropriate questionnaires in other countries. We used focus group interviews [15–23] at the initial stage of this research reported here to elicit information from health-care workers in China about how they conceptualize patient safety and safety culture, assess whether the domains and items covered in existing surveys adequately address their needs and concerns, and generate additional items for measuring safety culture in Chinese hospitals.

Methods

Generation of items

A Medline search of English and a CNKI (China National Knowledge Information) search of Chinese literature between 2000 and 2010 identified 11 questionnaires for measuring patient safety culture in hospitals. After excluding four questionnaires used for a single hospital specialty, or not publicly available, we selected the remaining seven questionnaires [24–30] for translation into Chinese and further review. A translator fluent in English and Chinese developed a draft of the Chinese translation, and a reviewer trained and based in the USA, with extensive experience working in Chinese hospitals and with prior translation experience checked it for accuracy.

An eight-member expert panel comprising health-care managers, researchers and clinicians reviewed all questionnaires. The panel used 39 items in the US Agency for Healthcare Research and Quality (AHRQ)’s HSOPSC as the principal candidate items and supplemented them with appropriate questions from the other six questionnaires. The panel removed all three items under the domain of frequency of event reporting in the HSOPSC; these items were not perceived to be useful because error-reporting rates are known to be low in Chinese hospitals. A list of 97 candidate items was generated for inclusion in focus group discussions and organized into 11 domains based on the HSOPSC framework: (1) hospital management support for patient safety, (2) supervisor/manager expectations and actions promoting safety, (3) organizational learning—continuous improvement, (4) communication openness, (5) feedback and communication about error, (6) non-punitive responses to error, (7) teamwork within units, (8) teamwork across units, (9) staffing, (10) handoffs and transitions, and (11) overall perceptions of patient safety [24]. Items outside these domains were grouped into an ‘other’ category.

Subjects

We recruited physicians, nurses and other health-care workers (i.e. pharmacists, physical therapists) from 11 hospitals to participate in one of three focus groups conducted in three Chinese cities (Shanghai, Nanjing and Hangzhou) during July and August 2010. We sought eight subjects per group and recruited potential participants by telephone invitations. We attempted to create groups homogeneous with respect to profession, including one group of nurses in Shanghai, one group of physicians in Hangzhou and one mixed group of nurses and other health-care workers in Nanjing. To qualify for inclusion, subjects had to work at least 1 year in the current hospital and 4 weeks in the current department prior to the focus group. Employees on leaves of absence or maternity leave were excluded. This study was approved in advance by the Ethics Review Committee of the World Health Organization (funding organization) and of Shanghai University of Traditional Chinese Medicine (local administering institute).

Conduct of the focus groups

Each session lasted ~2 h and was facilitated by the same researcher using a semi-structured discussion guide. A second researcher took notes and recorded responses. Sessions were also audio-taped and then transcribed.

The facilitator first explained the purpose of the groups, described procedures, assured participants of confidentiality and answered questions. Participants were then asked to complete a written informed consent document and a brief demographic questionnaire. Next, the facilitator introduced definition of safety culture—‘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’ [31]. This was followed by an open group discussion in which participants were asked to freely share thoughts and perspectives about what patient safety and safety culture meant to them, what patient care they associated with safe care, the most positive attributes of patient safety and barriers to safe patient care in their hospitals.

In addition, participants were presented with a handout containing 97 candidate items derived from the literature review and expert panel, and asked to rate the importance of each item in assessing patient safety on a five-point scale, from 1 (very unimportant) to 5 (very important). After rating all the items within a domain, participants were asked to discuss the following questions:

(i) Were there any items you found difficult to understand or to answer?

(ii) Should the items be described using different terminology? If so, how would you propose to modify them?
(iii) Were there any missing items? If so, please suggest additional items for inclusion.
(iv) Was the domain label the most culturally appropriate way to organize these items? If not, how would you propose to modify it?

Finally, the groups were asked about whether the domains covered the range of patient safety issues in Chinese hospitals and to suggest additional domains that should be included in the questionnaire. By the third session held in Nanjing, no new information emerged.

**Data analysis**

We evaluated the perceived importance of each item by examining the percentage of participants who rated the item as important (selecting ‘4’ or ‘5’). Next, we performed thematic analyses on written transcripts and field notes from the sessions [32]. The existing domains from the HSOPSC were used as the main framework for analysis, but the research team sought to identify additional perspectives from the participants. New items identified from focus groups were then sorted into appropriate domains using index cards. Finally, we analyzed whether a specific item should be retained or eliminated. Items that were rated as important by less than half of the participants were removed, while those rated as important by more than 90% of the participants were retained. We used the following criteria to remove the remaining items from consideration: (1) the item was semantically redundant, ambiguous, confusing, not contributing to culture assessment, likely to be interpreted differently among respondents, inapplicable to the local situation or lacked the ability to differentiate among respondents, or (2) respondents would not have enough information to answer the question.

**Results**

**Participant characteristics**

A total of 24 providers participated in the three focus groups (eight per group), including 8 physicians, 12 nurses, 2 pharmacists and 2 physical therapists who worked in various departments. Two-thirds of the participants were females, and 83% were in the 31–50 years age group (Table 1).

**Findings from open-ended group discussions**

The participants were able to understand the concept of patient safety and talked about what the term meant to them based on their personal experiences.

Patient safety means to me that we should not do anything to harm patients. For example, we need to check a patient’s name, hospital number, medicine name, dosage, route, administering time before giving any medicines to the patient. (nurse, Shanghai)

(All quotations were translated from Chinese.)

However, safety culture was a novel concept to some participants.

I haven’t really thought about patient safety culture yet. Our hospital leadership mentioned it several times, but it seems too abstract and elusive to me, and I still don’t understand what a good culture is and what a bad one is. This is the first time I’ve heard about the definition. (physician, Hangzhou)

Next, participants raised a wide range of characteristics of patient care they associated with safe care, such as open communication, compliance with rules and procedures, continuity of care, adequate staffing, teamwork, staff training, leadership support and learning from mistakes.

Finally, when asked about factors that supported patient safety in their hospitals, participants mentioned colleague support within units, adequate equipment and new staff orientation. They also talked about barriers to safe care, including low ratio of staff to beds, poor communication across departments, low priority of safety in leadership’s agenda, punishment of staff for making a mistake that affected a patient, sweeping mistakes under the carpet and responding to errors reactively.

**Findings from item and domain reviews**

We calculated the percentage of participants who rated each item as important for measuring safety culture in their work settings and found large variation in the perceived importance across items. Table 2 shows the four items that were
rated as important by less than half of the participants, and the four items rated as important by all of the participants. We eliminated the four items rated important by less than half of the participants and an additional 35 items meeting one of the exclusion criteria—12 due to redundancy, 12 considered to be ambiguous or confusing, 6 regarded as not contributing to culture assessment, 2 as a result of inability to differentiate among respondents, 1 due to inapplicability to the local situation and 2 because respondents would not have enough information to answer the question. Examples of items eliminated and the reasons for doing so are presented in Table 3.

### Table 2 Items that either all of the participants or less than half of the participants rated as important

<table>
<thead>
<tr>
<th>Items that all of the participants rated as important</th>
<th>Associated domains*</th>
</tr>
</thead>
<tbody>
<tr>
<td>My supervisor/manager seriously considers staff suggestions for improving patient safety [24]</td>
<td>Supervisor/manager expectations and actions promoting safety</td>
</tr>
<tr>
<td>In this unit, we discuss ways to prevent errors from happening again [24]</td>
<td>Feedback and communication about errors</td>
</tr>
<tr>
<td>Hospital management provides a work climate that promotes patient safety [24]</td>
<td>Hospital management support for patient safety</td>
</tr>
<tr>
<td>In my unit, anyone who intentionally violates standard procedures or safety rules is swiftly corrected [28]</td>
<td>Development of and compliance with rules and procedures</td>
</tr>
</tbody>
</table>

**Items that less than half of the participants rated as important**

- It is often unpleasant to work with staff from other hospital units [24]
- Shift changes are problematic for patients in this hospital [24]
- I am asked to cut corners to get the job done [28]
- A harmless mistake involving a patient doesn’t need to be shared with the patient and family [25]

*English translations of Chinese domain names.

### Table 3 Examples of items eliminated after the focus groups

<table>
<thead>
<tr>
<th>Items</th>
<th>Reasons for removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital management seems interested in patient safety only after an adverse event happens [24]</td>
<td>This item is vague because the answers ‘disagree’ or ‘strongly disagree’ may be interpreted either as ‘hospital management is interested in patient safety even if there is no adverse event’ or ‘hospital management is still not interested in patient safety even if there is an adverse event’</td>
</tr>
<tr>
<td>Asking for help is a sign of incompetence [28]</td>
<td>This item is confusing as respondents did not understand it consistently among themselves</td>
</tr>
<tr>
<td>Supervisors earnestly listen to our objections [25]</td>
<td>This item is ambiguous and difficult to measure</td>
</tr>
<tr>
<td>A worker’s behavior that deviates slightly from the rules is tolerated if it causes no trouble [25]</td>
<td>This item is regarded as not contributing to the assessment of culture since most of the rules are not strictly followed in most Chinese hospitals. Instead, participants proposed new items to measure compliance with rules and procedures</td>
</tr>
<tr>
<td>Compared to other facilities in the area, this facility cares more about the quality of patient care it provides [28]</td>
<td>Respondents did not have the information needed to answer the question as they did not have a clear picture about the safety performance in other hospitals</td>
</tr>
<tr>
<td>We use more agency/temporary staff than is best for patient care [24]</td>
<td>Respondents identified it as not applicable to the local situation as most Chinese hospitals do not use a lot of agency/temporary staff</td>
</tr>
<tr>
<td>Staff worry that mistakes they make are kept in their personnel file [24]</td>
<td>The item lacks the ability to differentiate among respondents because every person would worry that mistakes he or she makes are kept in their personnel file</td>
</tr>
<tr>
<td>We support one another in this unit [24]</td>
<td>Respondents regarded it as duplicating the item ‘We treat each other with respect in this unit’</td>
</tr>
</tbody>
</table>

253
In developing the item list, respondents focused considerable attention on who was the subject of the question. They proposed to use either ‘we’ or ‘my colleagues’ to increase the respondents’ comfort. Similarly, they suggested evaluating the unit management as a group, not as a specific supervisor. Respondents found that some of the English-language items were too abstract. We thus tried to reformulate the items into a language that would be readily understandable to the average Chinese provider. For example, in the item ‘mistakes have led to positive changes here’ [24], borrowed from AHRQ survey, participants pointed out that it is actually not ‘mistakes’ but ‘lessons learned from mistakes’ which lead to positive changes. So, the item was changed to ‘lessons learned from previous mistakes have led to a positive change’.

Analysis of focus group transcripts and notes helped identify eight new survey items, including two questions assessing staff training, two questions evaluating mentoring, three questions measuring development of and compliance with policies and procedures, and one question measuring leadership patient safety walk-rounds (Table 4).

Participants agreed that the 11 domains from the HSOPSC were culturally appropriate for organizing elements of safety culture in Chinese hospitals. Furthermore, they identified three additional domains, including staff training and mentoring, equipment availability, and development of and compliance with rules and procedures. The participants repeatedly emphasized the importance to patient safety of staff training and compliance to procedures.

Training staff in various aspects of quality improvement and patient safety would help raise awareness. The hospital should add this information in the orientation and regular in-service training. (nurse, Shanghai)

The staff tend to ignore established rules, procedures, and guidelines. Some of them are actually outdated. Keeping these rules current and reinforcing compliance would be important actions managers should take. (pharmacist, Nanjing)

The 66 final items were sorted into the 14 domains (Table 5).

**Discussion**

In this focus group study of health-care workers from 11 Chinese hospitals, we found that participants were able to understand the concept of patient safety and safety culture in the Chinese context and identify features associated with safe care. Participants identified questions that translated poorly from existing surveys to the Chinese context. They endorsed three new domains and eight additional questionnaire items absent from existing tools but appropriate for the Chinese setting, including staff training, mentoring of new hires, compliance with rules and procedures, equipment availability and leadership walk-rounds. Additional items were revised to have a more general focus or be more readily understandable to providers in China. This process resulted in a 66-item and 14-domain draft instrument for testing in cognitive interviews, the next stage of survey development.

Participants viewed open communication, including communication about errors, as one of the cornerstones of safe care. In an atmosphere where staff are free to raise concerns and ask questions about something that may adversely affect patient care, unsafe system issues and patient hazards are more likely to be identified and for changes to be made. However, in reality, many health-care workers in China shy away from discussing adverse events, asking questions or challenging those with more authority even when they disagree.

Participants recognized that adequate staffing is crucial for patient safety and mentioned that a low ratio of staff to beds...
Table 5  The safety culture domains and the number of items within each domain

<table>
<thead>
<tr>
<th>Domains</th>
<th>Source</th>
<th>Number</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital management support for patient safety</td>
<td>AHRQ [24]</td>
<td>7</td>
<td>AHRQ [24], Singer et al. [28], Matsubara et al. [25], Weingart et al. [29], Sexton et al. [27], Pronovost et al. [26], Connelly et al. [30], newly identified</td>
</tr>
<tr>
<td>Supervisor/manager expectations and actions promoting safety</td>
<td>AHRQ [24]</td>
<td>4</td>
<td>AHRQ [24], Singer et al. [28]</td>
</tr>
<tr>
<td>Organizational learning—continuous improvement</td>
<td>AHRQ [24]</td>
<td>4</td>
<td>AHRQ [24], Matsubara et al. [25]</td>
</tr>
<tr>
<td>Communication openness</td>
<td>AHRQ [24]</td>
<td>6</td>
<td>AHRQ [24], Singer et al. [28], Sexton et al. [27], Matsubara et al. [25]</td>
</tr>
<tr>
<td>Feedback and communication about error</td>
<td>AHRQ [24]</td>
<td>7</td>
<td>AHRQ [24], Singer et al. [28], Matsubara et al. [25], Connelly et al. [30]</td>
</tr>
<tr>
<td>Non-punitive responses to error</td>
<td>AHRQ [24]</td>
<td>4</td>
<td>AHRQ [24], Singer et al. [28], Weingart et al. [29]</td>
</tr>
<tr>
<td>Teamwork within units</td>
<td>AHRQ [24]</td>
<td>7</td>
<td>AHRQ [24], Singer et al. [28], Sexton et al. [27]</td>
</tr>
<tr>
<td>Staffing</td>
<td>AHRQ [24]</td>
<td>4</td>
<td>AHRQ [24], Singer et al. [28]</td>
</tr>
<tr>
<td>Handoffs and transitions</td>
<td>AHRQ [24]</td>
<td>3</td>
<td>AHRQ [24], Sexton et al. [27]</td>
</tr>
<tr>
<td>Overall perceptions of patient safety</td>
<td>AHRQ [24]</td>
<td>6</td>
<td>AHRQ [24], Singer et al. [28], Sexton et al. [27]</td>
</tr>
<tr>
<td>Staff training and mentoring</td>
<td>Newly identified</td>
<td>4</td>
<td>Newly identified</td>
</tr>
<tr>
<td>Equipment availability</td>
<td>Newly identified</td>
<td>2</td>
<td>Singer et al. [28], Matsubara et al. [25]</td>
</tr>
<tr>
<td>Development of and compliance with rules and procedures</td>
<td>Newly identified</td>
<td>5</td>
<td>Singer et al. [28], newly identified</td>
</tr>
</tbody>
</table>

†English translations of Chinese domain names.

is one of the biggest challenges, particularly for nurses. This is consistent with a recent study of nurses’ perceptions of patient safety culture in one Chinese hospital where about two-thirds of respondents indicated that there were no enough staff to handle patient care safely [33].

Other important areas for patient safety in China include leadership support and learning from mistakes. Both are areas of potential improvement and underscored by a recent study investigating nurses’ perceptions of patient safety culture in 19 Chinese hospitals. The authors identified a punitive safety culture characterized by punishment of the person making an error, fear of reporting errors and under-reporting of nursing errors [34].

Using focus groups is valuable first step in our research project, by identifying new and inappropriate items and clarifying existing items that did not translate well into the Chinese context. We will further test these items in cognitive interviews and a cross-sectional survey. This instrument will be used to identify areas for improvement, raise awareness about patient safety, evaluate impacts of safety interventions and track changes over time [35]. It differs from organizational culture questionnaires that measure a broad range of general cultural domains without a specific focus on patient safety [36, 37].

The US AHRQ has promoted the international use of the HSOPSC and developed translation guidelines, and, as a result, the survey has been translated in 17 languages and used in 30 countries [38]. Although some evidence suggested similar psychometric properties between the translated version and the original version of survey instruments [39, 40], our research suggests that translation alone may be insufficient. There are aspects of the survey that must be adapted for use outside the USA. For example, the internal consistency of most items in the Arabic, Dutch and Chinese version of the HSOPSC was lower than that of the original items in the US study [14, 41, 42]. The Dutch version also detected a slightly different factor structure from the US version [41]. In addition, a recent study in England using the original version of the HSOPSC found that more than half of the items failed to achieve satisfactory internal consistency, and a confirmatory factor analysis indicated a poorer model fit than that in the original US model [43]. This study demonstrated that culture and diction must be taken into account when using the same instrument in two English-speaking countries. Local, regional and national context must be incorporated when applying existing measurement tools in different settings [14, 41–43].

Our study has several limitations. First, we examined an intentional sample of physicians, nurses and other healthcare workers, so we cannot generalize the results from focus groups alone. Secondly, we held only three focus groups. However, since we conducted an extensive literature review
and an expert panel review of the proposed items, a lesser number of group sessions may be sufficient for the development of a new instrument. Moreover, during the third focus group, participants discussed the same issues that emerged in the previous two sessions and did not introduce any new issues. The third limitation is the small sample size. Size is not, however, a major criterion in assessing the adequacy of focus group studies; what matters more is the appropriateness of the sample to the questions being explored and the richness and relevance of the responses provided. Our sample consisted of a variety of professional groups that reflected the multidisciplinary composition of the hospital-based providers. We also involved 11 hospitals in three cities. Finally, participants may have felt uncomfortable openly expressing themselves in the presence of others, although this risk was minimized through careful facilitation.

In conclusion, focus group participants provided important insights into the refinement of previously published survey items and the construction of new items and domains for measuring patient safety culture. This is a necessary first step in producing a questionnaire that is culturally appropriate for Chinese hospitals. The method we proposed here may offer lessons for those who want to develop an instrument, built on existing surveys, that is culturally applicable to specific local contexts.

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