Assessment of Patient Safety Culture in Malaysia Hospital Using Hospital Survey on Patient Safety Culture (HSOPSC) Survey

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Abstract

Patient safety culture assessments are the basic component in the patient safety improvement programs. The aim of this study is to evaluate the psychometric properties of Malay version of Hospital Survey on Patient Safety Culture (HSOPSC) and its suitability for Malaysian environment. A number of 723 clinical and non-clinical staff was involved from three general hospitals in southern region of Peninsular Malaysia. Principal component analysis and confirmatory factor analysis were used to study the psychometric properties of the translated HSOPSC, while internal consistency of 12-factor (42 items) model was examined by calculating the Cronbach α score. The principal component analysis revealed that an 11-factor model with 40 items was suitable for Malaysian sample. However, a Satorra-Bentler scaled χ2 difference test showed that the original 12-factor model significantly fitted the Malaysian data better than the 11-factor model. The internal consistency was at an acceptable level. Although there were 8 strong relationships among the 12 dimensions of patient safety culture, the relationship was found negative between all the 12 dimensions and patient safety grade. The hospital staff surveyed in Malaysia was practicing a positive working attitude towards the patient safety culture

Keywords: Safety climate; psychometric analysis; patient safety culture

Introduction

- Safety culture assessment is one of the important elements in improving the patient safety. It is often conducted by surveying the patient safety climate [1].
- Patient safety climate is a mutual understanding among the hospital staff on the essential characteristics of patient safety. It reflects the understanding of patient safety culture as fundamental values, behaviours and beliefs in a healthcare organization's approach to patient safety [2].
- Those surveys have been used to develop strategies and programs and to engage the hospital top management and professionals [3].

Problem statement

- Patient safety in the context of healthcare organizations was highlighted following the Institute of Medicine (IOM) report “To Error is Human: Building a Safer Health System” [4].
  - This report argued for a safety culture in which adverse events can be reported without people being blamed and when mistakes happen, lessons are learned.
- Therefore, if hospitals want to improve the patient safety, it is important to know more about the views of their staff in relation to the culture of patient safety.

Objectives

This study aims:

1. To evaluate the psychometric properties of a Malay translation of Hospital Survey on Patient Safety Culture (HSOPSC) questionnaire and assesses its appropriateness for Malaysian settings
2. To compared the result with US and 6 other Asian countries for benchmarking

Methodology - Questionnaire

1. Investigators with a team of expert in patient safety performed initial translation of the original HSOPSC survey into Malay and review the 42 items appropriateness to Malaysia culture *(Based from Brislin's classic model for translation and validation of instruments for cross-cultural research [13])*
2. An expert in the English language whose native language is Malay reviewed the Malay translated version of HSOPSC
3. A 3rd party independent bilingual translator who not comes across with the original HSOPSC questionnaire had translated it back into English
4. Finally, modifications were made in demographic items regarding the difference in professional groups and department of the hospitals

Methodology - Sample

- Paper based questionnaire was distributed to clinical and non-clinical staff at 3 general hospitals in Johor Bahru, Malaysia (n =1167)
- A total of 735 questionnaires were returned with response rate of 78% during the 3 months period (September to November 2013)
- Out of 735 returned questionnaires, 12 questionnaires were omitted due to the respondents answered less than two-third of the entire questionnaire

Methodology - Statistical analysis

- SPSS 17 and AMOS 18 was used for the following statistical analyses:
  - Principal component analysis (PCA)
  - Confirmatory factor analysis (CFA)
- As principal component analysis (PCA) and confirmatory factor analysis (CFA) cannot be performed on the same dataset, the sample was divide randomly into two independent groups [14].
  - PCA was performed on the first group of the sample (n= 362) to examine the component structure of new translation version of the instrument into another language and different cultural setting. In order to minimize item cross loadings, a 0.4 cut-off value was chosen
  - Two separate CFAs were performed on the second group of the dataset (n =361) to compare the model fit of the original 12-factor versus the alternative model.

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  - Two separate CFAs were performed on the second group of the dataset (n =361) to compare the model fit of the original 12-factor versus the alternative model.
- Satorra-Bentler scaled $\chi 2$ difference test was calculated to evaluate the difference in fit between the original 12-factor (42-items) model with the alternative factor model
- Cronbach α score was calculated using the whole sample to examine the internal consistency of the 12-factor (42-items) model.

Results & Discussion

- From the surveys:
  - 85.7% of the respondents had direct contact with patients
  - 63% of the sample had worked more than six years in their current organization
  - Majority of the respondents were nurse (56.4%), physicians (15.3%), management and administrative staff (10.7%), technicians (8.9%), related healthcare professionals (7.4%), and other (1.3%)
- The Kaiser-Meyer-Olkin measure of sampling adequacy was satisfactory, with a value of 0.856, indicating common variance among the items
- The Bartlett test of sphericity ($\chi 2 = 7179.1$; $df = 872$; $p < 0.001$) demonstrating inter-item correlations sufficient for performing PCA

Results & Discussion

- Original 12-factor model
  - The CFA for the original 12-factor model with 42 items ($\chi 2 = 3793.3$; df 820; $p < 0.0005$, n= 361) showed CFI was 0.9 and RMSEA was 0.045.
  - The standardized factor loadings were generally large (>0.60) and ranged from 0.26 (organizational learning and continuous improvement) to 0.92 (frequency of event reporting).
- Alternative 10-factor model
  - For the alternative 10-factor model with 40 items ($\chi 2 = 3413.0$; df 703; $p < 0.0005$, n= 361), it also fitted sufficiently with CFI of 0.9 and RMSEA of 0.047.
  - The standardized factor loadings were also generally large (>0.60) and ranged from 0.22 (organizational learning and continuous improvement) to 0.93 (frequency of event reporting).

Results & Discussion

- Satorra-Bentler scaled $\chi 2$ difference test was calculated to evaluate the difference in fit between the original 12-factor (42-items) model and nested 10-factor (42-items) model
  - Results from the Satorra-Bentler scaled $\chi 2$ difference test showed that the 12-factor model with 42 items was a significantly better fit than the 10-factor nested model with 42 items ($\chi 2$ difference = 121.418; df 30; $p < 0.001$)
- **Table 1:** also shows the reliability level of the Malay translation version as compared to the original US HSOPSC and few other Asia countries
- **Table 2:** Mean, standard deviant (SD) and inter correlation coefficients for 12-factor patient safety culture and patient safety grade
- **Table 3:** Scores for 12 dimensions patient safety culture for Malaysian sample
- **Table 4:** Patient safety grade and number of events reported and submitted in the last 12 months

Table 1: Internal consistency scales.

Scales (number of items)	Cronbach α							
	MLY	US	CHI	TAI	JPN	TUR	PAL	LEB
Unit-level dimensions								
Supervisor/manager expectations (4)	0.70	0.75	0.51	0.73	0.70	0.67	0.75	0.57
Organizational learning and continuous improvement (3)	0.71	0.76	0.74	0.68	0.65	0.56	0.79	0.50
Teamwork within units (4)	0.75	0.83	0.72	0.78	0.83	0.84	0.77	0.68
Communication openness (3)	0.54	0.72	0.47	0.51	0.62	0.67	0.41	0.46
Feedback and communication about error (3)	0.72	0.78	0.64	0.36	0.77	0.81	0.73	0.65
Non-punitive response to error (3)	0.69	0.79	0.75	0.70	0.71	0.71	0.60	0.53
Staffing (4)	0.53	0.63	0.63	0.51	0.46	0.63	0.75	0.48
Hospital-level dimensions								
Hospital management support for patient safety (3)	0.68	0.83	0.67	0.70	0.61	0.59	0.66	0.63
Teamwork across hospital units (4)	0.68	0.80	0.63	0.69	0.70	0.73	0.61	0.69
Hospital handoffs and transitions (4)	0.71	0.80	-	0.76	0.73	0.70	0.73	0.74
Outcome measures								
Overall perceptions of safety (4)	0.49	0.84	0.64	0.52	0.62	0.43	0.43	0.45
Frequency of event reporting (3)	0.72	0.74	-	0.53	0.88	0.93	0.73	0.81

MLY = Malaysia; US = United States of America; CHI = China; TAI = Taiwan; JPN = Japan; TUR = Turkey; PAL = Palestine; LEB = Lebanon.

Table 2: Mean, standard deviant (SD) and inter correlation coefficients for 12-factor patient safety culture and patient safety grade.

Factor	Composite of patient safety culture	Mean	SD	FA 1	FA 2	FA 3	FA 4	FA 5	FA 6	FA 7	FA 8	FA 9	FA 10	FA 11	FA 12
FA 1	Overall perceptions of safety	3.53	0.71												
FA 2	Frequency of events reported	3.92	0.88	0.32											
FA 3	Supervisor/ manager expectations and actions promoting patient safety	3.66	0.71	0.44	0.21										
FA 4	Organizational learning– continuous improvement	3.61	0.52	0.48	0.33	0.37									
FA 5	Teamwork within units	3.66	0.71	0.31	0.13	0.51	0.42								
FA 6	Communication openness	3.66	0.80	0.39	0.29	0.64	0.42	0.49							
FA 7	Feedback and communication about error	3.56	0.76	0.51	0.42	0.43	0.49	0.45	0.71						

FA 8	Non-punitive response to error	3.21	0.71	0.43	0.16	0.38	0.29	0.19	0.33	0.26					
FA 9	Staffing	2.81	0.82	0.61	0.08	0.33	0.43	0.15	0.22	0.30	0.38				
FA 10	Hospital management support for patient safety	3.21	0.77	0.54	0.17	0.39	0.40	0.38	0.31	0.46	0.37	0.48			
FA 11	Teamwork across hospital units	3.31	0.90	0.23	0.19	0.33	0.49	0.39	0.61	0.41	0.19	0.29	0.47		
FA 12	Hospital handoffs and transitions	3.55	0.76	0.28	0.13	0.27	0.24	0.31	0.27	0.39	0.21	0.23	0.33	0.59	
–	Safety grade			−0.49	−0.21	−0.43	−0.33	−0.29	−0.30	−0.31	−0.27	−0.32	−0.39	−0.32	−0.36

$p < 0.01$; FA = factor.

Table 3: Scores for 12 dimensions patient safety culture for Malaysian sample

Dimensions and items of patient safety culture	Score	CI (95%)
Overall perceptions of safety	36	31–38
Patient safety is never sacrificed to get more work done (A15)	47	43–49
Our procedures and systems are good at preventing errors from happening (A18)	33	27–35
It is just by chance that more serious mistakes do not happen around here (RA10)	30	28–33
We have patient safety problems in this unit (RA17)	35	31–39
Frequency of events reported	64	62–67
When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? (D1)	66	62–68
When a mistake is made, but has no potential to harm the patient, how often is this reported? (D2)	56	52–59

When a mistake is made that could harm the patient, but does not, how often is this reported? (D3)	71	70–76
Supervisor/manager expectations and actions promoting patient safety	65	62–66
My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures (B1)	53	50–57
My supervisor/manager seriously considers staff suggestions for improving patient safety (B2)	61	60–64
Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts (RB3)	70	68–73
My supervisor/manager overlooks patient safety problems that happen over and over (RB4)	76	73–79
Organizational learning - continuous improvement	49	46–53
We are actively doing things to improve patient safety (A6)	70	68–73
Mistakes have led to positive changes here (A9)	43	41–46
After we make changes to improve patient safety, we evaluate their effectiveness (A13)	35	31–37
Teamwork within units	54	51–58
People support one another in this unit (A1)	66	63–69
When a lot of work needs to be done quickly, we work together as a team to get the work done (A3)	73	69–75
In this unit, people treat each other with respect (A4)	44	39–48
When one area in this unit gets really busy, others help out (A11)	39	37–41
	37	36–39

Communication openness		
Staff will freely speak up if they see something that may negatively affect patient care (C2)	41	40–46
Staff feel free to question the decisions or actions of those with more authority (C4)	32	31–37
Staff are afraid to ask questions when something does not seem right (RC6)	38	33–40
Feedback and communication about error	52	48–53
We are given feedback about changes put into place based on event reports (C1)	33	31–35
We are informed about errors that happen in this unit (C3)	56	53–58
In this unit, we discuss ways to prevent errors from happening again (C5)	67	63–71
Non-punitive response to error	38	36–43
Staff feel like their mistakes are held against them (RA8)	42	35–43
When an event is reported, it feels like the person is being written up, not the problem (RA12)	39	36–42
Staff worry that mistakes they make are kept in their personnel file (RA16)	33	31–35

Staffing		
We have enough staff to handle the workload (A2)	25	21–26
Staff in this unit work longer hours than is best for patient care (RA5)	33	30–35
We use more agency/temporary staff than is best for patient care (RA7)	31	30–34
We work in 'crisis mode' trying to do too much, too quickly (RA14)	29	27–33
Hospital management support for patient safety	39	35–41
Hospital management provides a work climate that promotes patient safety (F1)	39	37–43
The actions of hospital management show that patient safety is a top priority (F8)	45	42–47
Hospital management seems interested in patient safety only after an adverse event happens (RF9)	34	31–36
Teamwork across hospital units	39	36–43
There is good cooperation among hospital units that need to work together (F4)	51	50–54
Hospital units work well together to provide the best care for patients (F10)	42	35–45
Hospital units do not coordinate well with each other (RF2)	24	21–27
It is often unpleasant to work with staff from other hospital units (RF6)	41	37–44
Hospital handoffs and transitions	47	44–49
Things 'fall between the cracks' when transferring patients from one unit to another (RF3)	47	43–52
Important patient care information is often lost during shift changes (RF5)	54	51–58
Problems often occur in the exchange of information across hospital units (RF7)	34	29–37
Shift changes are problematic for patients in this hospital (RF11)	51	43–55

R = reversed items; CI = confident interval; N = 723

Table 4: Patient safety grade and number of events reported and submitted in the last 12 months

	Percentage of respondents (%) N = 723
Overall patient safety grade [a]	
Excellent	5
Good	39
Acceptable	48
Poor	7
Failure	1
Number of events reported and submitted in the last 12 months [b]	
None	58
1–2	21
3–5	16
6–10	4
11–20	1
≥21	0

[a] 7% of respondents did not answer [b] 16% of respondents did not answer

Results & Discussion

- In this study, three models were explored to see how they fit the Malaysian data.
  - The three models include the original AHRQ 12-factor (42-items) model
  - The 10-factor (40-items) model
  - Nested 10-factor (42-items) model
- Findings from the PCA analysis revealed that the alternative 10-factor model was slightly differ from the original 12-factor model
- In addition, the Satorra-Bentler scaled $\chi 2$ difference test results revealed that a 12-factor model significantly better fit the Malaysian data
  - This finding was close to Sarac and friends [23] where the difference between their 10-factor model and the original 12-factor model also showed the 12-factor model fit their data better.

Results & Discussion

- The relationship between the 12 dimensions and the patient safety grade was negative shows that this outcome variable is inconsistent with staff perception on the 12 dimensions of patient safety culture.
  - This might reflect the staff perception of patient safety grades more positive against the rest of patient safety culture dimensions.
- None of the patient safety culture dimensions attained the 75% of positive answers set value.
- There were also some inconsistent between the results, such as frequency of events reported (64% of positive answers) and non-punitive response to error (38% of positive answers).
  - This variance can be explained by the understanding of the importance to report errors by the hospital staff.
  - Although the staff understands the importance to report errors, they refuse to report due to legal actions that can be enforced on them

Conclusion

- This study provides an overall assessment of patient safety perceptions among hospital staff in Malaysia.
- Results demonstrated that amongst the hospital staff surveyed in Malaysia, there was a positive attitude towards patient safety culture in their work place.
- In spite of that, the results also revealed that there are several areas for improvement including
  - overall perceptions of safety
  - organizational learning - continuous improvement
  - communication openness
  - non-punitive response to error
  - Staffing
  - hospital management support for patient safety
  - teamwork across hospital units.

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