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# Assessing the Perceptions of the Health Care Workforce Toward the Patient Safety Culture in Vietnamese Hospitals

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The main objective of this study was to use the translated version of Hospital Survey on Patient Safety Culture, the English-Vietnamese Hospital Survey on Patient Safety Culture (E-V HSOPSC), to assess the patient safety culture in Vietnamese hospitals and examine the extent to which safety attitudes vary between staff, hospitals, and health care systems. In addition, this study aimed to evaluate the psychometric properties of the instrument in Vietnamese dataset. We evaluated whether patient safety culture contributes to establish a positive patient safety culture—the cornerstone of a quality health care. In May 2015, the E-V HSOPSC was conducted with 1500 staff from 10 hospitals in Vietnam. The respondents were asked to return the completed surveys after a 3-month period. Before assessing the perceptions of health care workforce toward organizational safety culture, a confirmatory factor analysis, construct validity, and reliability were performed using SPSS and Amos 23.0. A total of 1116 questionnaires were eligible for data analysis. The outcomes from factor analysis verified the fitness and validity of the instrument. The positive response rate across 12 safety culture dimensions in the questionnaire ranged from 30% (Hospital Handoffs and Transitions) to 77% (Teamwork within Hospital Units). Overall, the mean positive score was 58.9%, which was slightly lower than of the United States. The safety was graded as "Very Good" by 52.6% of respondents in Vietnam. The E-V HSOPSC was appropriate to assess the patient safety culture in Vietnam, because the instrument provided adequate evidence of validity and reliability and patient safety culture strengths and deficiencies.

*Key words:* Patient safety culture – Vietnam – HSOPSC – Questionnaire – Medical error – Adverse event

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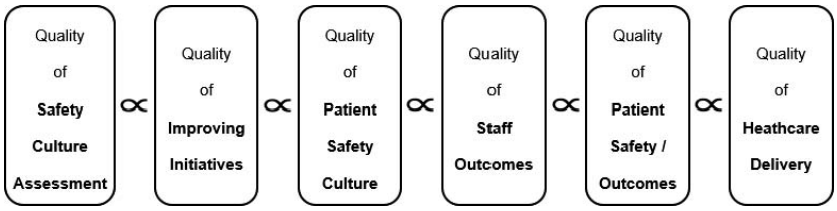


**Fig. 1** Linear relationship between the quality of PSC and health care delivery.

Adverse events (AEs) have been proven to affect 10% of patients worldwide.[1,2] Of the 43 million AEs, two-thirds have occurred in developing and transitional countries (DTCs).[3] Throughout the care-giving process, AEs possibly arise from the inherent lack of safety in health care practices, products, procedures, environments, or systems.[4] Although the United States has made significant efforts to place AEs under the microscope since the 1950s, until recently, this issue has been neglected in some DTCs, particularly Vietnam.[5–7] Theoretically extrapolating the mortality in Vietnam from the annual death rate of approximately 1.9% in a DTC would yield 208,000 deaths.[8,9]

Patient safety can be understood as a strategy for reliable health care, involving the eradication of AEs and the maximum recovery from their impact.[10–12] A positive patient safety culture (PSC), which is achieved from insight into the processes of errors through a PSC assessment, is widely accepted to address AEs (Fig. 1).[11–20] As a result, many researchers advocate that the most common and comprehensive explanation is as follows:

"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. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures".[21]

When contextualizing the definition, it is apparent that a "blame and shame" and a "pathological" culture should be eliminated. This imperative action will allow the growth of a positive PSC, which influences the discretionary behaviors of staff towards patient safety as the highest priority.[17] Furthermore, a workplace with a positive PSC can encourage health care professionals to acknowledge the existence of AEs, voluntarily accept their faults, and contribute to an open discussion about the errors to acquire experience to ameliorate the impact of AEs and prevent latent lethality.[17,22,23] The literature confirms that not until a PSC assessment is initiated can a positive PSC be successfully established to enhance patient and staff outcomes.[17–19,24,25] Specifically, the profound understanding of perceptions of staff toward a PSC is a precursor to a safety breakthrough, providing a guide for (1) solving deficient areas, (2) raising awareness about patient safety, (3) comparing different initiatives and tracking change, (4) conducting internal and external benchmarking, and (4) fulfilling directives or regulatory requirements.[17]

Many researchers argue that an accurate diagnosis of PSC starts with the evaluation of the psychometric properties of the Hospital Survey on Patient Safety Culture (HSOPSC) published by the Agency for Healthcare Research and Quality (AHRQ).[12,18,19,24–26] The HSOPSC is a highly trusted instrument providing valuable evidence of PSC in a health care system.[27–30] Thus, by realizing the significance of PSC assessment in enhancing patient safety, the main objective of this research was to use the translated version of the HSOPSC to assess the perceptions toward PSC at the staff level, hospital level, and system level. In addition, this study also aimed to evaluate the attributes of psychometric properties of the HSOPSC in Vietnam in terms of validity and reliability. Not only should the findings of this study provide an understanding of the current PSC and explanation of the unique phenomena in Vietnamese health care system, but also help to determine whether further refinement is required to improve the applicability of the instrument in Vietnam.

## Materials and Methods

### *Study design and population*

In this cross-sectional research, simple random sampling was chosen to obtain the sample of 1500 staff members from 10 hospitals. Specifically, at each site, the research coordinator classified staff members from all departments according to profession, including physician, nurse, health professional, and administrator. Afterward, each individual from the 4 lists

*Table 1 General information about the Vietnamese health care system*

| Country profile | | | |
|---|---|---|---|
| Location | Southeast Asia | Population (million) | ≈90.7 |
| Area ($km^2$) | ≈331,700 | Urban population (%) | ≈33 |
| Provinces | 64 | Density of country (population/$km^2$) | 289 |
| Economic status | Lower-middle-income | Density of 1 major city (population/$km^2$) | 3589 |
| GDP per capita ($) | ≈2052.3 | Population below poverty line (%) | ≈13.5 |
| Health care system profile | | | |
| System focus | Preventive and clinical | Physician density (/1000 population) | 0.75 |
| Public hospital (classified from "Special" to "IV") | ≈1037 in quantity | Nurse density (/1000 population) | 1.12 |
| | Hospital class ∝ quality | Hospital bed density (/1000 population) | 2.3 |
| | Lower charge | Geographical preference of physician | Metropolis |
| Private hospital (no classification) | ≈128 in quantity | Hospital preference of physician | High class |
| | Lower quality | Lowest health care staff Satisfaction | Salary |
| | Lower public trust | Overcrowding hospital | Core |
| Social health insurance (only 1 mandatory scheme) | 70.8% of population | System weakness | Infrastructure |
| | Comprehensive coverage | Public health (% of health expenditure) | 30 |
| | Mostly with public hospital | | |

Vietnam, a lower-middle-income country located in the Southeast Asia, has a global 13th-ranked population of approximately 90.7 million, of which 33% is urban population.[a,b] There are 64 provinces in Vietnam, with the total surface area of about 331,700 $km^2$.[a] It is estimated that the highest population density in 1 major city is 3589 population/$km^2$ compared with 289 population/$km^2$ which is the national average population density.[a] Concerning the economical aspect, the population living below poverty line is 13.5%, and the gross domestic product per capita in recent years is $2052.3, according to World Bank.[c,d] Nowadays, the medical system of Vietnam is a mixed public-private system in which the public sector, organized under a governmental administrative hierarchy from the central to local levels, possesses the greatest proportion of 89% (≈1037 hospitals) of health care institutions in the country.[a,e] The state-owned hospitals are classified from "Special" to "IV," based on the quality assessment conducted by the government. It is evident that all of the special- and-first-class hospitals are more trustworthy due to the higher quality and the lower cost for medical care compared with most of the private ones.[e] With the aim to reach an universal health coverage, the government currently struggles to have all Vietnamese citizens participate in the only one and mandatory social health insurance covering the diagnosis and treatment of a wide range of conditions and diseases.[e] Regarding the medical workforce in Vietnam, the density of physicians, pharmacists, and nurses is 0.75 and 1.12 per 1000 population, respectively.[e] These figures are much lower than the critical threshold of 2.3 per 1000 population, recommended by the WHO.[f] Moreover, the hospital bed density in Vietnam, estimated to be 2.8 per 1000 population, stays at the bottom compared with many developing and developed countries of which the population size is smaller than of Vietnam.[g] In addition, most of the skilful clinical practitioners prefer to work in the high-class public hospitals, which are most likely located in a metropolis, as a result of better salary (but still unsatisfactory), living standard, and career advancement.[e] Hence, the core health care institutions always face an overcrowding situation.[e] It is also very important to realize that the public system significantly focuses on both preventive (accounting for 30% of health expenditure) and clinical medicine.[e] Meanwhile, the country has implemented many crucial policies to overcome the overcrowding problem at the tertiary and central hospitals.[e] Under these policies, comprehensive investments in human resources capacity, medical equipment, and devices and infrastructure for the health care institutions at the lower levels and primary care are the government's priority.[e]

[a]Obtained from ref. 84.

[b]Obtained from ref. 85.

[c]Obtained from ref. 86.

[d]Obtained from ref. 87.

[e]Obtained from ref. 76.

[f]Obtained from ref. 88.

[g]Obtained from ref. 89.

classified by profession were coded as a positive integer and randomized to either a selected or nonselected group through the random allocation software, which represents the unbiased surveying technique mentioned above.[31] The selection process was ceased when the selected group reached a sample of 20 physicians, 30 nurses, 80 health professionals, and 20 administrators. This was intentional to reflect the proportional allocation in Vietnam.

Priority was given to "high-class" Vietnamese hospitals (Table 1) because of the potential bias existing in the hospitals with low occupancy, workload, and workforce quantity, affecting the true patient safety and PSC.[32] Geographic proximity to the researcher resulted in 10 randomly selected hospitals from 3 conveniently sampled cities in the southern Vietnam.

The 3-month dissemination of the survey started on May 15, 2015. The research coordinator at each

setting was responsible for personally distributing the questionnaires, along with the information sheets in unmarked envelopes to the staff in the designated list, subjected to their attendance in the hospital based on the shift schedules obtained from their departments. The information sheets functioned to provide the participants adequate knowledge about the purpose of the research and all of the important procedures to return the completed questionnaires eligibly and anonymously. Particularly, to maintain anonymity, the participants were asked to check and confirm that no marking existed anywhere before starting the questionnaire. Subsequently, they were requested to put only the completed questionnaires in sealed and unmarked envelopes, without disclosing any personal details in their questionnaires and envelopes. The participation in this study was voluntary. In addition, the withdrawal from the study was totally free, and it was optional for the participants to pass the information about the study to anyone sharing the same duties and interested in participating in the study. The research coordinator at each hospital also helped to consult regarding any uncertainty not only in understanding the research, but also in following the protocols for an eligible return. Upon completion, the sealed envelopes were personally handed to the research coordinator at each site who would check the eligibility. Only the unidentifiable envelopes would be accepted and placed by the respondents into drop boxes in the room of the research coordinator. The main investigator collected the envelopes directly at each site on the planned date. To increase the response rate (RR), a classic total design method was used with timed reminders and follow-up mailings including the repetition of the questionaire.[33,34] A signed consent form was not required, as filling out the questionnaire implied consent.

### *Measuring instruments*

#### First principles of the choice of HSOPSC

Westat originally developed the HSOPSC.[35] Within a rigorous design structure, respondents were questioned about 10 PSC topics and 2 safety outcomes through a 5-point Likert response scale of agreement or frequency. Due to its concise coverage of core PSC dimensions and the substantial amount of evidence of reliability and validity, the HSOPSC is accepted worldwide.[36–38] It is also possible for cross-national comparisons due to the availability of international benchmark data. Hence, based on the nature of this research, the HSOPSC meets more psychometric criteria of the objectives compared with the other instruments including the Safety Attitudes Questionnaire and the Modified Stanford Instrument questionnaire.[39–41]

#### Development of the bilingual Vietnamese-English HSOPSC

In numerous multinational and multicultural research projects, translation and cross-cultural adaptation (TCCA) has been applied to standardize research instruments, including the HSOPSC, to ensure the maximum relevance between the source and target versions linguistically and culturally.[42–44] Thus, the bilingual English-Vietnamese HSOPSC (E-V HSOPSC) was also formed through TCCA (Table 2). It is intended to include the English language for clarification. In addition, a customization for the Vietnamese sample is necessary, as the HSOPSC was developed exclusively for American health care. Therefore, the E-V HSPOSC underwent a cognitive debriefing with 40 interviews with medical professionals to screen for any unacceptability. Upon completion, the instrument was thought to be concise and appropriate. Hence, all items were retained to keep the instrument comparable with its original version.

### *Research ethics permission*

In Vietnam, no formal ethical approval is required to conduct this kind of research; hence, this study followed the principle of the Helsinki Declaration. Together with support from the participating hospitals, the approval from a qualified institutional review board was granted.

### *Data analysis*

Within preanalysis, invalid surveys were classified as those with at least one section incomplete, less than half of all items answered, or the same response to all items, and these surveys were removed.[35] In addition, any survey with an identification mark was also excluded. Regarding scoring criteria, the highest (4–5), middle (3), and lowest (1–2) answers were perceived as positive, neutral, and negative responses, respectively. For negatively worded items, this approach was reversed to ensure the homogeneity along the survey. The missing values were then substituted by multiple imputations under the expectation–maximization algorithm.[45]

An in-depth analysis began with the demographic characteristics of the respondents. The positive RR

*Table 2 Translation and cross-cultural adaptation of the E-V HSOPSC*

| Step | Description |
|---|---|
| Forward translation | The translation of the HSOPSC[a] into 2 Vietnamese versions (T1 and T2) was implemented by 2 native Vietnamese speakers (TR1 and TR2).<br>TR1 is an uninformed NAATI[b] certified translator without medical or clinical background, whereas TR2 is informed physician who is fluent in English with IELTS[c] band 8.0. |
| Reconciliation | The generation of a synthesis version (T1-2) from T1 and T2 was implemented by TR1, TR2, and the principal researcher. Solutions to any discrepancies was achieved by consensus. |
| Backward translation | The translation of T-12 into 2 English versions (BT1 and BT2) was implemented by 2 uninformed native English speakers to ensure high quality control of the translation.<br>Back translator 1 is an American physician working in a private clinic in Vietnam for >15 years, whereas back translator 2 is a English language teacher fluent in Vietnamese. |
| Harmonization | Comparison and adjustment of all translations against each other and the HSOPSC were done to generate the bilingual E-V HSOPSC[d], by the principal researcher.<br>The English language in the E-V HSOPSC was kept as original. By this step, any possible discrepancies were minimized; hence, the conceptual equivalence and the high quality of the translation were enhanced. Solutions to any discrepancies were achieved by consensus. |
| Cognitive debriefing | Forty cognitive interviews with medical professionals were performed to evaluate the comprehensibility, acceptability, and cognitive equivalence of the E-V HSOPSC. |
| Review of cognitive debriefing | From the revision of the opinions of participants, terminological adjustments to produce a final the E-V HSOPSC for Vietnamese healthcare was implemented by the principal researcher.<br>Proofreading of the final version of bilingual E-V HSOPSC to detect any remaining potential errors was performed by the principal researcher. |

[a]Hospital Survey on Patient Safety Culture.

[b]National Accreditation Authority for Translators and Interpreters.

[c]International English Language Testing System.

[d]English-Vietnamese Hospital Survey on Patient Safety Culture.

on every item and factor was summarized to evaluate the perceptions towards PSC. The data then underwent the measures of appropriateness for factor analysis.[46] Next, a confirmatory factor analysis (CFA) was implemented to assess the usability of the original factor structure in the Vietnamese sample in terms of global and local fitness.[47–51] Thereafter, for further construct validity, Pearson's correlation coefficients for all factors were calculated based on the composite score of each dimension. Subsequently, correlations between each dimension and the Patient Safety Grade were also examined. Finally, the internal consistency was measured using Cronbach's $\alpha$ for the instrument to examine the extent to which the instrument is reliable.[52] Table 3 provides a glossary explaining the common terms in the data analysis and the minimum cutoffs.[46–53] All statistical analyses were performed using SPSS 23.0 and Amos 23.0 for Windows platform (Camperdown NSW 2006, Sydney, Australia).

## Results

### *Sample and response statistics*

The first part of Table 4 demonstrates the characteristics of the health care institutions participating in this research. Overall, the hospitals differ by type, ownership, teaching status, and capacity.

Specifically, 6 of 7 hospitals in city 1, including hospitals A, B, C, D, E, and F, are public teaching hospitals. All of them are large hospitals with $\geq$1000 beds, except that hospital B is a medium-sized hospital with 500 to 999 beds. Regarding hospital G, this is the only small-sized private nonteaching health care institution in the city, with 50 to 499 beds. In terms of specialization, 3 health care institutions, namely E, F, and G, are general hospitals, whereas the remaining ones specializes in various medical branches including oncology, infectology, obstetrics and gynecology, and pediatrics.

In city 2, although hospital H is a small-sized public nonteaching one specializing in pulmonology, hospital I is a medium-sized public teaching general hospital. The last hospital, namely J, is a small-sized health care institution in city 3 and functions as a public nonteaching general hospital.

The rest of Table 4 illustrates the proportions of RR in 10 hospitals in the 7 categories of occupation. In addition, 74.4% of questionnaires (ranging from 62.0% to 85.3%) were eligible for data analysis. The rate of response from medium and large public

*Table 3 Glossary of terms and their minimum cutoffs used in data analysis*

| Test | Cutoffs | Explanation |
|---|---|---|
| Measures of appropriateness for factor analysis | | To assess the adequacy of dataset for factor analysis, basing on the level correlations between items.[a] |
| KMO | ≥0.50[a] | KMO coefficient helps to assess if the correlation matrices is adequate for a factor analysis.[a] |
| MSA | ≥0.50[a] | MSA coefficient proves whether a single item is suitable for a factor analysis.[a] |
| Bartlett's test of sphericity | $P < 0.001$[a] | To check if the inter-item correlations are sufficient for a factor analysis.[a] |
| CFA | | To examine the fitness of a model to data by comparing the observed and expected covariance matrices.[b] |
| $\chi^2$ | Smaller, better[b] | To assess model fit by indicate the difference between the observed and expected covariance matrices.[b] |
| *df* | Larger, better[b] | A degree of freedom indicating the number of values of a statistic that are free to vary.[b] |
| $\chi^2/df$ | <0.30[b] | A normed $\chi^2$ value indicating the fit of model with less sensitivity of the $\chi^2$ value.[b] |
| CFI | >0.90[b] | To assess model fit by analyzing the discrepancy between the data and the hypothesized model.[b] |
| GFI | >0.90[b] | To assess fit between the hypothesized model and the observed covariance matrix.[b] |
| TLI | >0.90[b] | Conceptually similar to CFI and involves a mathematical comparison of a observed and baseline model.[b] |
| SRMR | <0.08[b] | Absolute measure of fit defined as the standardized difference between the observed and predicted correlation.[b] |
| RMSEA | ≤0.07[b] | Absolute measure of fit analyzing the discrepancy between the hypothesized model and population covariance matrix.[b] |
| Indicator reliability | ≥0.30[b] | To measure the goodness of fit, assessing whether each construct can be reliably estimated from its indicators.[b] |
| Composite reliability | ≥0.70[c] | To measure the goodness of fit, whether the constructs within the model are sufficiently distinguishable.[c] |
| AVE | >0.50[d] | The average amount of variation that a latent construct is able to explain in the observed variables.[d] |
| Construct validity | | The extent to which a test captures a specific theoretical construct.[d] |
| FLR | <1.00[d] | Discriminant validity is achieved when square root of AVE greater than inter-construct correlations.[d] |
| Pearson's correlation | <0.40[e] | represents the relationship between two variables that are measured on the same interval or ratio scale.[e] |
| Reliability | | The extent to which questionnaire items can be considered as a single latent construct.[e] |
| Cronbach's α | ≥0.70[e] | A (lowerbound) estimate of the reliability of a psychometric test.[e] |

[a]Obtained from ref. 46.
[b]Obtained from refs. 47 and 48.
[c]Obtained from ref. 50.
[d]Obtained from ref. 51.
[e]Obtained from ref. 49.
[f]Obtained from refs. 52 and 53.

specialized teaching hospitals was greater than that of small hospitals.

As for staff groups, the majority of respondents were health professionals, accounting for 51.5%, which was about fivefold greater than administrators. Physicians and nurses comprised 15.3% and 22.6%, respectively. For each job title, a small difference in RR among hospitals was recorded.

In terms of division, the largest percentages of employees came from nonoperational medicine (20.0%), followed by surgery, emergency, cross unit, radiology, and pharmacy, with a mean of 9.2% (±1.0%). Generally, the number of respondents oscillated across units and between hospitals. Based on practice, roughly four-fifths of the population had direct interaction with patients. It is evident that individuals with less than 10 years of experience in the current unit, hospital, and profession constituted precisely 85% of the total workforce. Regarding those with over 21 years of experience, this figure

*Table 4 Demographics of respondents*

| Characteristic | Hospitals (n = 10) | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | J | |
| Hospital profile | | | | | | | | | | | |
| City | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | |
| Bed quantity[a] | L | M | L | L | L | L | S | S | M | S | |
| Ownership[b] | • | • | • | • | • | • | | • | • | • | |
| Teaching status[c] | • | • | • | • | • | • | | | • | | |
| Specialization[d] | | | | | • | • | • | | • | • | |
| Distributed (n) | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 1500 |
| Returned | 135 | 124 | 129 | 138 | 142 | 133 | 129 | 121 | 132 | 116 | 1299 |
| Eligible | 128 | 120 | 107 | 119 | 123 | 111 | 103 | 93 | 99 | 113 | 1116 |
| Response rate (%) | 85.3 | 80.0 | 71.3 | 79.3 | 82.0 | 74.0 | 68.7 | 62.0 | 66.0 | 75.3 | 74.4 |
| Staff groups | | | | | | | | | | | |
| Physician | 12.5 | 14.2 | 16.8 | 15.1 | 16.2 | 15.3 | 15.6 | 18.3 | 15.1 | 15.0 | 15.3 |
| Nurse | 22.7 | 19.1 | 21.5 | 22.7 | 23.6 | 18.9 | 24.3 | 24.7 | 29.3 | 21.3 | 22.6 |
| Health professional | 54.7 | 56.6 | 50.5 | 52.9 | 47.1 | 55.8 | 47.4 | 47.4 | 49.4 | 51.3 | 51.5 |
| Administrator | 10.1 | 10.0 | 11.2 | 9.2 | 13.0 | 9.9 | 12.6 | 9.7 | 6.0 | 12.4 | 10.5 |
| Health care division | | | | | | | | | | | |
| Cross units/no specific | 7.0 | 5.8 | 10.3 | 6.7 | 10.6 | 21.6 | 9.7 | 7.5 | 9.1 | 6.2 | 9.4 |
| Medicine | 28.1 | 19.2 | 13.1 | 36.1 | 22.0 | 5.4 | 5.8 | 19.4 | 44.4 | 5.3 | 20.0 |
| Surgery | 22.7 | 12.5 | 5.6 | 2.5 | 12.2 | 6.3 | 13.6 | 20.4 | 3.0 | 16.8 | 9.9 |
| Obstetrics | 0.0 | 0.0 | 17.8 | 0.0 | 0.0 | 1.8 | 14.6 | 0.0 | 0.0 | 4.4 | 3.7 |
| Pediatrics | 0.0 | 8.3 | 0.0 | 4.2 | 0.0 | 4.5 | 5.8 | 0.0 | 13.1 | 0.0 | 3.5 |
| Emergency | 3.1 | 5.0 | 3.7 | 10.9 | 10.6 | 4.5 | 12.6 | 4.3 | 5.1 | 26.5 | 9.6 |
| Intensive care | 4.7 | 5.8 | 5.6 | 5.0 | 8.9 | 4.5 | 2.9 | 4.3 | 2.0 | 3.5 | 4.8 |
| Psychiatry/mental health | 0.8 | 2.5 | 2.8 | 1.7 | 0.0 | 7.2 | 2.9 | 3.2 | 2.0 | 0.0 | 2.2 |
| Rehabilitation | 2.3 | 0.0 | 6.5 | 0.0 | 3.3 | 3.6 | 3.9 | 8.6 | 4.0 | 14.2 | 5.3 |
| Pharmacy | 7.0 | 5.8 | 6.5 | 12.6 | 8.9 | 5.4 | 7.8 | 9.7 | 10.1 | 8.8 | 8.2 |
| Laboratory | 8.6 | 14.2 | 15.0 | 8.4 | 2.4 | 9.0 | 3.9 | 4.3 | 1.0 | 2.7 | 7.1 |
| Radiology | 7.8 | 15.0 | 4.7 | 8.4 | 13.8 | 10.8 | 10.7 | 10.8 | 3.0 | 3.5 | 9.0 |
| Anaesthesiology | 2.3 | 1.7 | 5.6 | 0.8 | 4.9 | 9.9 | 3.9 | 5.4 | 3.0 | 1.8 | 3.9 |
| Other | 5.5 | 4.2 | 2.8 | 2.5 | 2.4 | 5.4 | 1.9 | 2.2 | 0.0 | 6.2 | 3.4 |
| Professional years | | | | | | | | | | | |
| <1 | 12.5 | 10.0 | 21.5 | 1.7 | 6.5 | 2.7 | 6.8 | 6.5 | 11.1 | 0.9 | 8.0 |
| 1–5 | 41.4 | 39.2 | 42.1 | 48.7 | 31.7 | 45.9 | 54.4 | 46.2 | 32.2 | 31.0 | 41.1 |
| 6–10 | 30.5 | 36.7 | 25.2 | 36.1 | 34.1 | 21.6 | 26.2 | 37.6 | 45.5 | 48.7 | 34.1 |
| 11–15 | 10.9 | 12.5 | 10.3 | 8.4 | 19.5 | 12.6 | 10.7 | 7.5 | 5.1 | 15.9 | 11.6 |
| 16–20 | 3.1 | 0.8 | 0.9 | 4.2 | 6.5 | 16.2 | 1.0 | 0.0 | 3.0 | 2.7 | 3.9 |
| >21 | 1.6 | 0.8 | 0.0 | 0.8 | 1.6 | 0.9 | 1.0 | 2.2 | 3.0 | 0.9 | 1.3 |
| Hospital years | | | | | | | | | | | |
| <1 | 18.0 | 17.5 | 20.6 | 7.6 | 15.4 | 4.5 | 13.6 | 10.8 | 21.1 | 1.8 | 12.3 |
| 1–5 | 50.8 | 37.5 | 39.3 | 47.9 | 35.0 | 36.0 | 52.4 | 47.3 | 33.3 | 46.0 | 42.6 |
| 6–10 | 21.9 | 31.7 | 15.9 | 34.5 | 23.6 | 29.7 | 26.2 | 30.1 | 32.2 | 39.8 | 28.5 |
| 11–15 | 7.0 | 12.5 | 15.9 | 9.2 | 22.0 | 11.7 | 6.8 | 10.8 | 17.2 | 9.7 | 12.3 |
| 16–20 | 2.3 | 0.8 | 7.5 | 0.8 | 3.3 | 16.2 | 1.0 | 0.0 | 2.0 | 2.7 | 3.6 |
| >21 | 0.0 | 0.0 | 0.9 | 0.0 | 0.8 | 1.8 | 0.0 | 1.1 | 3.0 | 0.0 | 0.8 |
| Unit years | | | | | | | | | | | |
| <1 | 24.2 | 25.8 | 26.2 | 13.4 | 22.8 | 5.4 | 18.4 | 15.1 | 13.1 | 1.8 | 16.8 |
| 1–5 | 56.3 | 47.5 | 43.0 | 55.5 | 42.3 | 42.3 | 60.2 | 49.5 | 43.4 | 72.6 | 51.3 |
| 6–10 | 12.5 | 19.2 | 18.7 | 25.2 | 20.3 | 25.2 | 15.5 | 29.0 | 36.4 | 17.7 | 21.6 |
| 11–15 | 7.0 | 6.7 | 10.3 | 5.0 | 10.6 | 9.9 | 5.8 | 6.5 | 1.0 | 5.3 | 6.9 |
| 16–20 | 0.0 | 0.8 | 1.9 | 0.8 | 3.3 | 17.1 | 0.0 | 0.0 | 3.0 | 2.7 | 3.0 |
| >21 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.4 |
| Working hours per week | | | | | | | | | | | |
| <20 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 0.0 | 0.0 | 4.0 | 0.0 | 0.8 |
| 20–39 | 16.4 | 10.8 | 31.8 | 5.9 | 6.5 | 45.0 | 4.9 | 11.8 | 16.2 | 3.5 | 15.1 |
| 40–59 | 63.3 | 62.5 | 40.2 | 82.4 | 55.3 | 24.3 | 87.4 | 72.0 | 56.6 | 88.5 | 63.2 |
| 60–79 | 17.2 | 23.2 | 26.2 | 10.9 | 33.3 | 14.4 | 7.8 | 14.0 | 13.1 | 6.2 | 16.9 |
| 80–99 | 3.1 | 1.7 | 1.9 | 0.8 | 3.3 | 8.1 | 0.0 | 1.1 | 8.1 | 1.8 | 3.0 |
| ≥100 | 0.0 | 1.7 | 0.0 | 0.0 | 1.6 | 3.6 | 0.0 | 1.1 | 2.0 | 0 | 1.0 |

*Table 4 Continued*

| Characteristic | Hospitals (n = 10) | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | J | |
| Contact | | | | | | | | | | | |
| Direct patient interaction | 78.9 | 76.7 | 72.0 | 84.0 | 81.3 | 75.7 | 81.6 | 76.3 | 87.9 | 78.8 | 79.3 |
| Indirect patient interaction | 21.1 | 23.3 | 28.0 | 16.0 | 18.7 | 24.3 | 18.4 | 23.7 | 12.1 | 21.2 | 20.7 |

[a]Bed quantity: S, small (50–499 beds); M, medium (500–999 beds); L, large (≥1000 beds).

[b]Ownership: •, public hospital; blank, proprietary hospital.

[c]Teaching status: •, teaching; blank, nonteaching.

[d]Specialization: •, general hospital; blank, specialty hospital.

was significantly low at 0.4% in the 3 mentioned categories. Furthermore, it is crucial to note that 62.3% of the staff worked 40 to 59 hours and just ≤1.0% worked <20 or ≥100 hours per week.

## *HSOPSC application in Vietnam*

### Adequacy for factor analysis

Table 5 displays the figures for assessing the suitability of the data for factor analysis. The Kaiser-Meyer-Olkin (KMO) coefficient was 0.83, indicating the existence of compact patterns of correlations. In addition, the measure of sample adequacy (MSA) coefficients ranged between 0.52 (A17r) and 0.90 (F4), and the $\chi^2(861) = 10{,}505.9$, whereas $P < 0.001$ within Bartlett's test of sphericity. Hence, the data appropriateness for factor analysis was verified.

### Confirmatory factor analysis

The confirmatory factor analysis (CFA) model in Table 5 indicates an acceptable global data fit, as evidenced by $\chi^2(753) = 1076.5$, $P < 0.001$, and $\chi^2/df = 1.43$. This proposal was supported by a series of indices with a marginal adequacy, specifically the comparative fit index (CFI) = 0.84, goodness-of-fit index (GFI) = 0.92, Tucker-Lewis index (TFL) = 0.81, standardized root mean residual (SRMR) = 0.04, and root mean square error of approximation (RMSEA) = 0.04. Furthermore, variance tests (Table 6) revealed that the indicator reliabilities of 4 items (C2, C3, A7r, and A17r) dropped below the minimum allowance of 0.30. Among these, A7r had the lowest value at 0.21 compared with the highest at 0.55 by D2. Meanwhile, not only did all factor reliabilities remain beyond the recommended critical value of ≥0.70, but they were also approximately 25% higher than the average variance extracted (AVE) values in all dimensions. Except for Communication Openness (0.44), Nonpunitive Response To Error (0.45), Teamwork Across Hospital Units (0.46), and Staffing (0.47), the AVE value of every dimension reached the baseline of ≥0.50 with the peak of 0.56 for dimension 8. Therefore, a good convergent validity was achieved.

*Table 5 Model fits of the 12 E-V HSOPSC dimensions*

| Procedure | Model fit index | E-V HSOPSC |
|---|---|---|
| Measures of appropriateness for factor analysis | KMO | 0.83 |
| | MSA | 0.52–0.90 |
| | *P* | <0.001 |
| Confirmatory factor analysis | $\chi^2$ | 1076.55 |
| | *df* | 753 |
| | $\chi^2/df$ | 1.43 |
| | *P* | <0.001 |
| | CFI | 0.84 |
| | GFI | 0.92 |
| | TLI | 0.81 |
| | SRMR | 0.04 |
| | RMSEA | 0.04 |

### Construct validity

In terms of the Fornell-Larcker ratio (FLR; Table 5), the values of all factors were <1.00 (ranging from 0.13 to 0.79), an acceptable level of discriminant validity. Additionally, Table 7 indicated that most of the scale intercorrelations were weak because most of the values were <0.3. The correlation between dimensions 10 and 11 was weakest at a value of –0.03. There were only 4 correlations found to be strong (ranging from 0.40 to 0.49), with values at 0.40, 0.41, 0.45, and 0.47 for correlations between factor 1 and factors 2, 5, 8, and 9, respectively. Additionally, a positive relationship between each dimension and the Patient Safety Grade was not found to be significant. The strongest correlation was with Overall Perceptions of Safety ($r = 0.29$), followed by Frequency of Event Reporting ($r = 0.13$). Finally, Cronbach's α of the entire survey reached an adequate level at 0.83.

*Comparative study of patient safety culture*

**Attitudes of professionals**

Figure 2 illustrates the percentage breakdown of perceptions of PSC. The sample shared a common level of attitudes, which varied ≤10% between dimensions. On dimension 12, physicians responded most positively (15% greater than the others). In general, except on factors 6, 7, and 10, positivity constituted the largest proportion of attitudes (≥50%), with the highest rate of >78% on factor 3. Overall, physicians and nurses had the most similar perceptions, and administrators felt a little more negative about PSC among staff.

**Attitudes of health care institutions**

Figure 3 displays the comparison between the perceptions of PSC of Vietnamese hospitals. There was a rapid fluctuation of attitudes between hospitals throughout the 12 dimensions. With very low positive RRs (ranging from 18% to 58%), the areas covered in factors 6, 7, and 10 were the most problematic. Aspects in the first 3 dimensions were more positively viewed (≈73%) compared with the rest (≈53%).

It is recognizable that the positive RRs of hospital J were almost absolute on 10 factors. In addition, hospitals H and I responded more neutrally and negatively than the others, especially on factors 3 and 10 (>80%). Moreover, 5 hospitals, including E, F, G, I, and J, controlled the issues explained in dimensions 1 to 5 and 8 to 11 better than other hospitals, with 10% to 15% higher positive RR. In general, the trend for positive RR was popular, but it was not exceptionally high (<60%). Furthermore, the neutral response established the least at <0.5% in hospital J on dimensions 5, 8, 9, and 11.

With regard to the overall comparison based on the characteristics of the hospitals, it is evident that the positive RR of the general hospitals was about 9% higher than of the specialized hospitals. In accordance with the teaching status, teaching hospitals had an approximately 6% higher positive RR compared with the nonteaching ones. It was also found that there was a minor difference in positive RR in terms of the sizes and the ownership of the hospitals.

**Overview of patient safety culture in Vietnam**

Table 8 displays the percentages of positive RR on the items of 12 PSC dimensions and the comparisons with the studies in the United States, Palestine, and China.[54–56] The positive RRs of Vietnam on Feedback and Communication About Error (69%) and Frequency of Event Reporting (71%) were the highest among of nations. Although the highest positive RR of 77% belonged to factor 3, factor 6 had the lowest at 36%—ranking third behind the United States (44%) and China (60%).

At the item level, the positive RRs on C6r, A16r, F11r, and A17r were at the bottom (≤21%), contrary to the others within relevant subscales. However, the remaining countries handled these issues better

*Table 6 Local fit of items within the 12 E-V HSOPSC dimensions*

| Dimensions | Items | Indicator reliability | Composite reliability | AVE | FLR |
|---|---|---|---|---|---|
| 1. Supervisor/ manager expectations and actions promoting safety | B1 | 0.32 | 0.81 | 0.52 | 0.79 |
| | B2 | 0.34 | | | |
| | B3r | 0.39 | | | |
| | B4r | 0.47 | | | |
| 2. Organizational learning–continuous improvement | A6 | 0.36 | 0.76 | 0.51 | 0.46 |
| | A9 | 0.32 | | | |
| | A13 | 0.37 | | | |
| 3. Teamwork within hospital units | A1 | 0.30 | 0.80 | 0.51 | 0.40 |
| | A3 | 0.30 | | | |
| | A4 | 0.33 | | | |
| | A11 | 0.35 | | | |
| 4. Communication openness | C2 | 0.25 | 0.70 | 0.44 | 0.13 |
| | C4 | 0.45 | | | |
| | C6 | 0.34 | | | |
| 5. Feedback and communication about error | C1 | 0.35 | 0.79 | 0.55 | 0.55 |
| | C3 | 0.28 | | | |
| | C5 | 0.33 | | | |
| 6. Nonpunitive response to error | A8r | 0.53 | 0.71 | 0.45 | 0.20 |
| | A12r | 0.34 | | | |
| | A16r | 0.41 | | | |
| 7. Staffing | A2 | 0.40 | 0.78 | 0.47 | 0.31 |
| | A5r | 0.38 | | | |
| | A7r | 0.21 | | | |
| | A14r | 0.42 | | | |
| 8. Hospital management support for patient safety | F1 | 0.37 | 0.78 | 0.56 | 0.74 |
| | F8 | 0.40 | | | |
| | F9r | 0.36 | | | |
| 9. Teamwork across hospital units | F4 | 0.26 | 0.77 | 0.46 | 0.27 |
| | F10 | 0.35 | | | |
| | F2r | 0.33 | | | |
| | F6r | 0.39 | | | |
| 10. Hospital handoffs and transitions | F3r | 0.31 | 0.83 | 0.55 | 0.75 |
| | F5r | 0.37 | | | |
| | F7r | 0.52 | | | |
| | F11r | 0.47 | | | |
| 11. Frequency of event reporting | D1 | 0.48 | 0.77 | 0.53 | 0.77 |
| | D2 | 0.55 | | | |
| | D3 | 0.38 | | | |
| 12. Overall perceptions of safety | A15 | 0.35 | 0.77 | 0.50 | 0.62 |
| | A18 | 0.38 | | | |
| | A10r | 0.46 | | | |
| | A17r | 0.28 | | | |

*Table 7 Mean factor scores and intercorrelations of the 12 E-V HSOPSC dimensions*

| Factor | Mean | SD | Patient safety grade | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.61 | 0.63 | 0.10 | | | | | | | | | | | |
| 2 | 3.59 | 0.67 | 0.14 | 0.40 | | | | | | | | | | |
| 3 | 3.77 | 0.63 | 0.12 | 0.31 | 0.34 | | | | | | | | | |
| 4 | 3.87 | 0.54 | 0.07 | 0.35 | 0.22 | 0.18 | | | | | | | | |
| 5 | 3.37 | 0.53 | 0.08 | 0.41 | 0.25 | 0.27 | 0.36 | | | | | | | |
| 6 | 3.67 | 0.69 | 0.05 | 0.14 | 0.08 | -0.02 | 0.05 | -0.02 | | | | | | |
| 7 | 2.86 | 0.65 | 0.02 | 0.20 | 0.13 | 0.07 | 0.12 | 0.13 | 0.17 | | | | | |
| 8 | 3.14 | 0.56 | 0.04 | 0.45 | 0.36 | 0.25 | 0.30 | 0.28 | 0.17 | 0.17 | | | | |
| 9 | 3.69 | 0.70 | 0.12 | 0.47 | 0.31 | 0.27 | 0.28 | 0.34 | 0.10 | 0.20 | 0.49 | | | |
| 10 | 3.49 | 0.63 | -0.03 | 0.07 | 0.04 | 0.02 | 0.04 | 0.02 | 0.11 | 0.13 | 0.22 | 0.16 | | |
| 11 | 2.76 | 0.63 | 0.13 | 0.33 | 0.33 | 0.24 | 0.19 | 0.31 | 0.02 | 0.07 | 0.21 | 0.30 | -0.03 | |
| 12 | 3.72 | 0.59 | 0.29 | 0.30 | 0.31 | 0.24 | 0.22 | 0.17 | 0.19 | 0.18 | 0.22 | 0.30 | 0.08 | 0.15 |

than Vietnam, as indicated by the positive RRs ranging from 31% to 65%. Overall, Vietnam showed more positive perceptions than Palestine, except on factor 10. The positive RRs of Vietnam, although near the lower values, followed the same trends as the other countries.

**Outcomes of Vietnamese patient safety culture**

Figure 4 illustrates the percentage of safety grade and event reports in Vietnam. At first glance, very good and 1 to 2 reports made up the largest ratio in safety grades (>50%) and event reports (≈30%), respectively.

The data show that only 1.2% of physicians ranked the safety grade as poor, followed by health professionals (2.1%), nurses (3.2%), and administrators (5.1%). The grade acceptable represents ≈40% and excellent at only ≥5% of the total measurement. For event reports, 35% of administrators submitted no reports, whereas physicians seemed to raise more

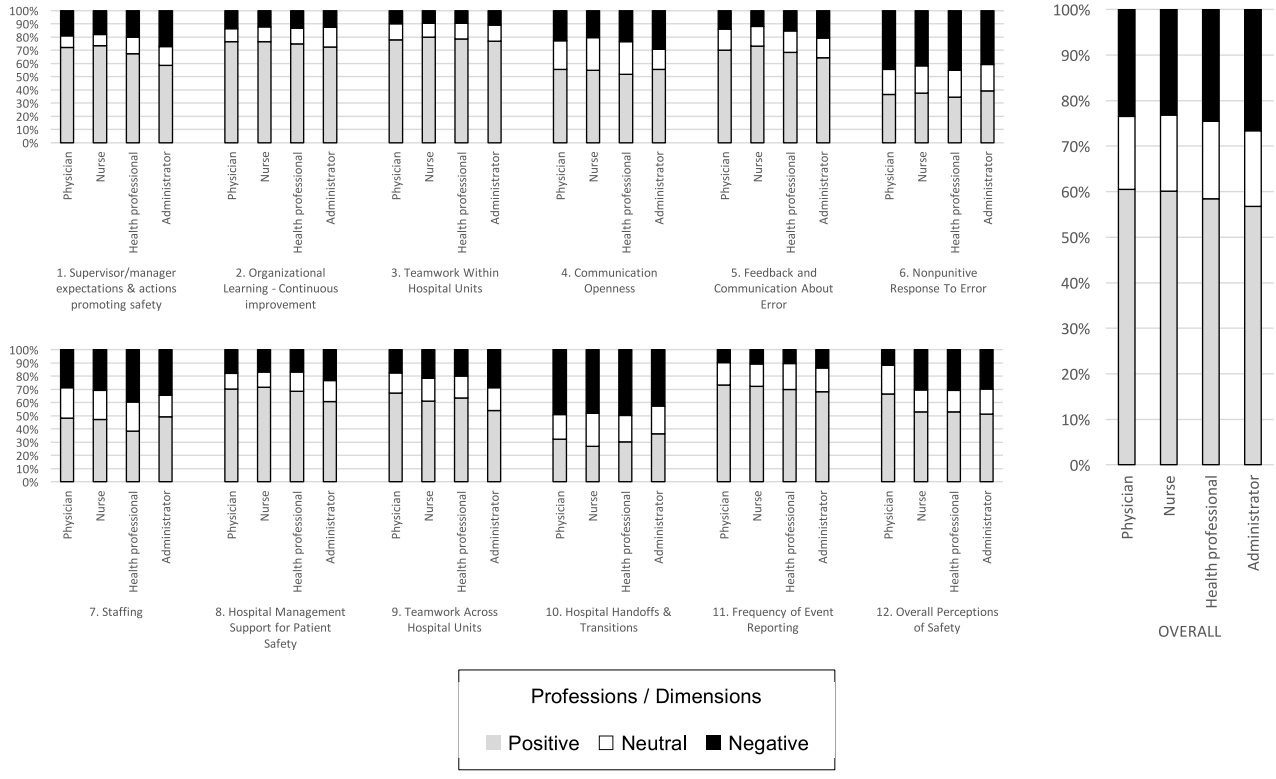


**Fig. 2** Attitudes of health care workforce toward the 12 E-V HSOPSC dimensions.

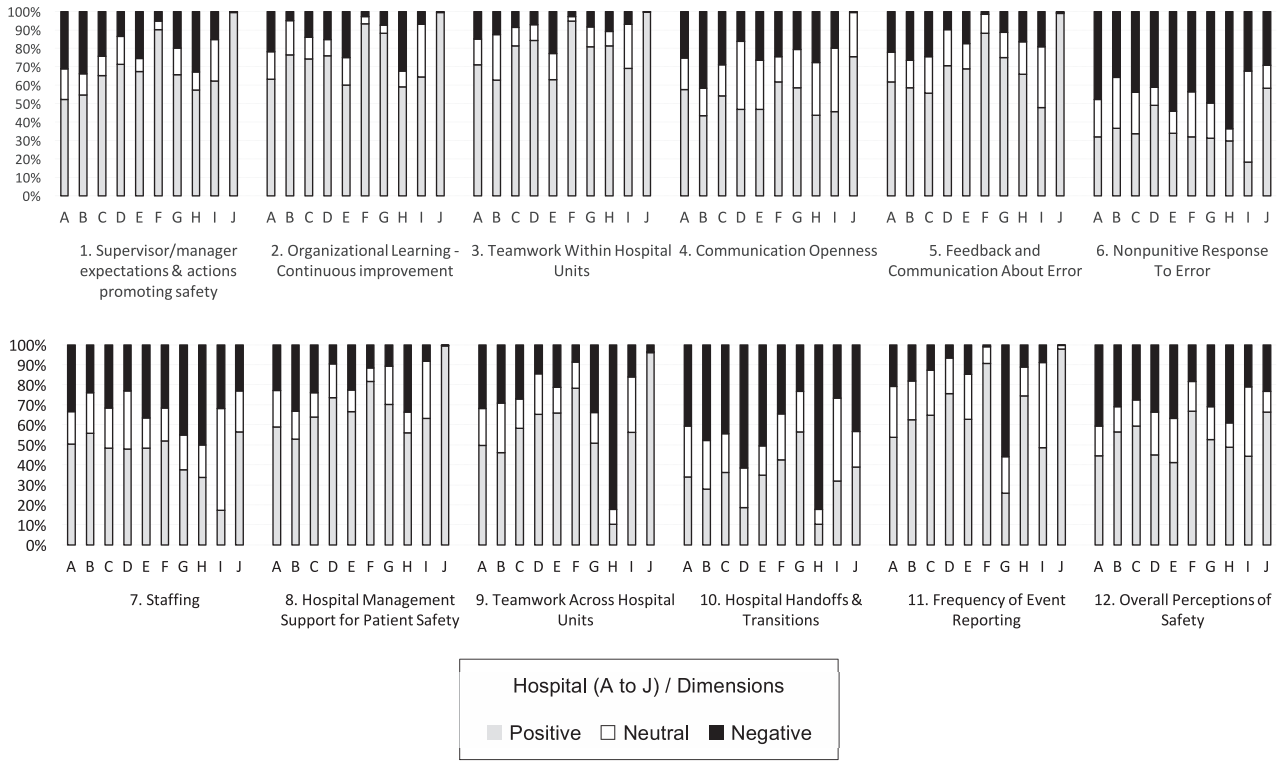


**Fig. 3** Attitudes of Vietnamese hospitals toward the 12 E-V HSOPSC dimensions.

concerns than others, and 16% of them wrote ≥21 reports during the last 12 months.

Concerning hospitals, 15.3% of respondents from hospital F declared their safety grade as excellent, which was double that of the other studied hospitals. Across the 10 hospitals, the majority of staff (>90.0%) rated patient safety as acceptable and very good, whereas only a few of them rated it as poor (≤2.5%). Regarding event reports, ≥80% of respondents submitted reports, and a quarter of them sent 1 to 2 reports. In hospital J, ≈40% of staff (highest compared to other hospitals) provided ≥21 event reports. Meanwhile, ≈49% of respondents in hospital D sent 6 to 10 event reports within the last 12 months.

In general, ≈8% of Vietnamese respondents ranked safety grades at the 2 extreme ends (2.5% for poor and 5.5% for excellent). The difference between acceptable and very good was 13%. For event reports, ≈80% of the staff wrote event reports, and the number of reports was inversely proportional to the percentage of staff.

## Discussion

The 1986 Chernobyl nuclear disaster accentuated the significance of a safety culture, and internationally the concept has been accepted in many industries, especially the health care sector.[57] In 1999, the publication of one of the earliest reports about patient safety, namely "To Err Is Human: Building a Safer Health System" by the Institute of Medicine in the United States, brought AEs and PSC to the forefront of global concern by revealing the substantial numbers of mortalities and morbidities due to AEs. Indeed, the report successfully called for a comprehensive effort worldwide to explore the challenges for a safety transformation.[14,58–64] It is universally agreed that assessing the PSC to establish a positive culture is a key step in the improving initiatives for patient safety, and the most frequently used instrument appears to be the HSOPSC.[57]

In different parts of the world, the trust in the HSOPSC is derived from a great amount of evidence verifying the validity and reliability as acceptable to good.[49,65–71] The findings from this study also contributed to the adaptability of psychometric properties of the HSOPSC. The CFA model clearly demonstrated an acceptable-to-good global fit between the original factor structure and the Vietnamese sample. Furthermore, the adequate values of indicator reliability, composite reliability, AVE, and

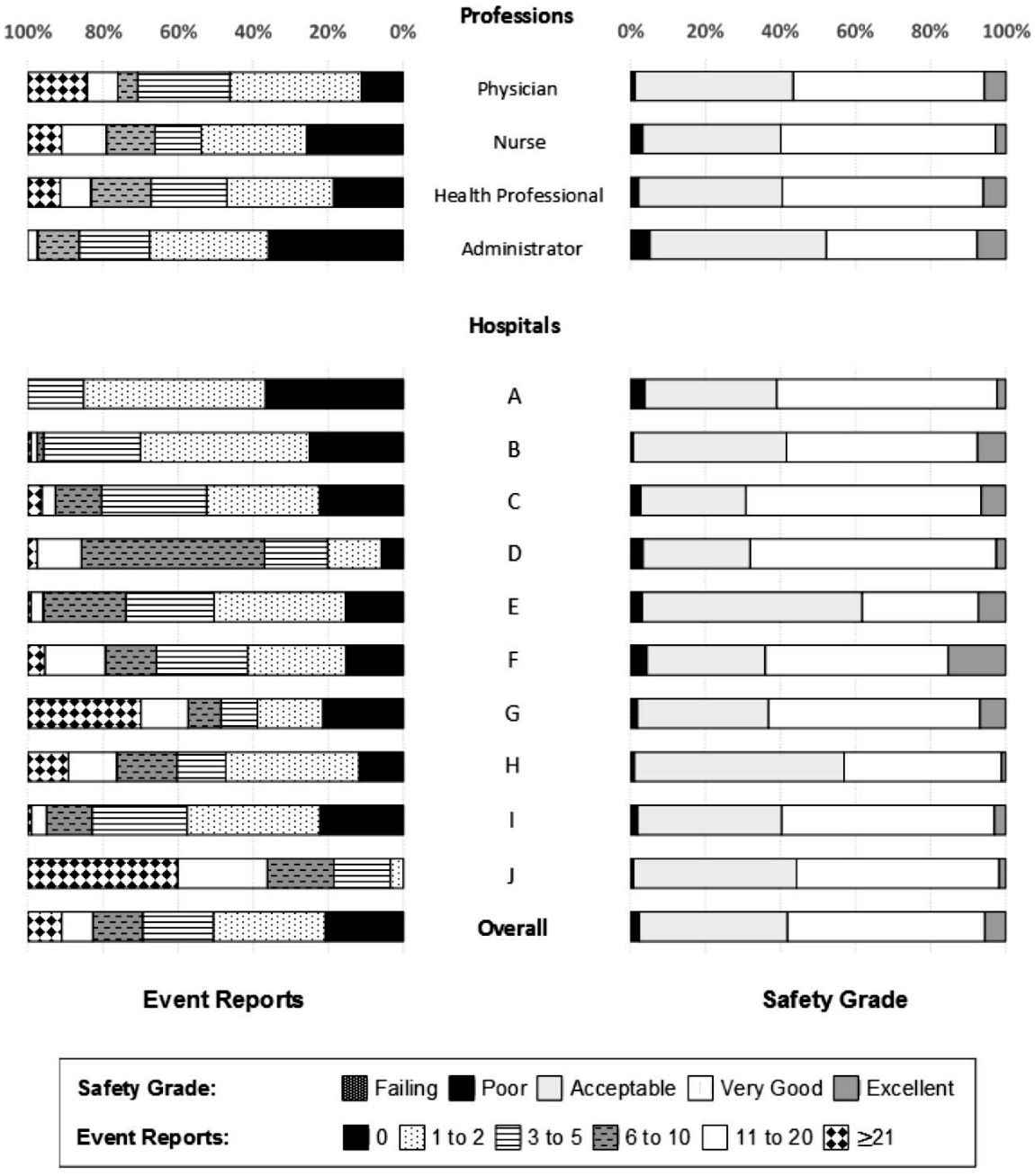


**Fig. 4** The comparisons of safety grade and event report between different professions and different hospitals.

FLR proved the convergent and discriminant validity. However, the AVE values of Communication Openness, Nonpunitive Response To Error, Teamwork Across Hospital Units, and Staffing did not confirm these findings because they were below the recommended criterion. Moreover, the intercorrelations between the 12 dimensions were found to be none or negligible. Only 4 correlations, particularly between factor 1 and the other 4 factors, including factors 2, 5, 8, and 9, were assumed to be moderate. Hence, together with the results of FLR, the 12 dimensions should be sufficiently distinguishable and capable of explaining and measuring different constructs. In addition, the positive correlation between the Patient Safety Grade and the Overall Perceptions of Safety is a well-defined indication of the validity of the latter scale. Finally, Cronbach's $\alpha$ indicates that the dimensions have an acceptable

*Table 8 Positive response rate on each item of the 12 E-V HSOPSC dimensions*

| Dimension / Items | Positive response rate % | | | |
|---|---|---|---|---|
| | VN | US[a] | PS[b] | CN[c] |
| **1. Supervisor/manager expectations & actions promoting safety** | **69** | **76** | **56** | **63** |
| B1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures. | 78 | 75 | 54 | N/A |
| B2. My supervisor/manager seriously considers staff suggestions for improving patient safety. | 78 | 77 | 56 | 76 |
| B3r. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts. (reverse worded) | 56 | 75 | 45 | 36 |
| B4r. My supervisor/manager overlooks patient safety problems that happen over and over. (reverse worded) | 62 | 77 | 69 | 78 |
| **2. Organizational Learning - Continuous Improvement** | **75** | **73** | **62** | **88** |
| A6. We are actively doing things to improve patient safety. | 80 | 84 | 83 | 87 |
| A9. Mistakes have led to positive changes here. | 73 | 64 | 56 | N/A |
| A13. After we make changes to improve patient safety, we evaluate their effectiveness. | 73 | 71 | 56 | 89 |
| **3. Teamwork Within Hospital Units** | **77** | **81** | **71** | **84** |
| A1. People support one another in this unit. | 84 | 86 | 76 | 87 |
| A3. When a lot of work needs to be done quickly, we work together as a team to get the work done. | 79 | 86 | 72 | 87 |
| A4. In this unit, people treat each other with respect. | 73 | 80 | 70 | 87 |
| A11. When one area in this unit gets really busy, others help out. | 79 | 71 | 67 | 81 |
| **4. Communication Openness** | **53** | **62** | **36** | **65** |
| C2. Staff will freely speak up if they see something that may negatively affect patient care. | 73 | 76 | 48 | 51 |
| C4. Staff feel free to question the decisions or actions of those with more authority. | 66 | 48 | 29 | 80 |
| C6r. Staff are afraid to ask questions when something does not seem right. (reverse worded) | 21 | 63 | 32 | 64 |
| **5. Feedback and Communication About Error** | **69** | **67** | **46** | **50** |
| C1. We are given feedback about changes put into place based on event reports. | 73 | 59 | 30 | 54 |
| C3. We are informed about errors that happen in this unit. | 65 | 67 | 52 | 64 |
| C5. In this unit, we discuss ways to prevent errors from happening again. | 70 | 73 | 56 | 53 |
| **6. Nonpunitive Response To Error** | **36** | **44** | **17** | **60** |
| A8r. Staff feel like their mistakes are held against them. (reverse worded) | 50 | 50 | 15 | 53 |
| A12r. When an event is reported, it feels like the person is being written up, not the problem. (reverse worded) | 43 | 48 | 23 | 67 |
| A16r. Staff worry that mistakes they make are kept in their personnel file. (reverse worded) | 15 | 35 | 12 | 60 |
| **7. Staffing** | **46** | **55** | **38** | **45** |
| A2. We have enough staff to handle the workload. | 66 | 54 | 18 | 42 |
| A5r. Staff in this unit work longer hours than is best for patient care. (reverse worded) | 38 | 52 | 81 | 38 |
| A7r. We use more agency/temporary staff than is best for patient care. (reverse worded) | 27 | 66 | 37 | 37 |
| A14r. We work in "crisis mode," trying to do too much, too quickly. (reverse worded) | 54 | 50 | 18 | 61 |

level of reliability. In this research, the choice of composite reliability was influenced by the fact that Cronbach's α wrongly assumes that all indicators contribute to reliability equally.[71,72] However, the composite reliability draws on the unstandardized regression weights and measurement error components for each indicator.[51,70] Overall, the construct validity indicated that advanced scale investigation and refinement are required to improve the applicability of the instrument. This attempt should not include the action of adding or reducing factors but adding new items that are unique to Vietnamese health care. In some studies, especially in the 2 studies in Taiwan and China, it was suggested that a modification for proper wording should be implemented due to the diversity of cultures.[56,73] However, this approach may affect the original meaning of the instrument.

Based on the evidence of reliability and validity, this research used the E-V HSOPSC to investigate the PSC status in Vietnam. The Vietnamese dataset expressed moderate positive attitudes (58.9% positive RR) toward the 12 dimensions. This figure was lower than of the United States and China but not Palestine.[54–56] The highest positive RR was exhibited by Teamwork Within Hospital Units, which is similar in Belgium, the United States, Palestine, Taiwan, and The Netherlands.[28,54–56,73–75] In contrast, Hospital Handoffs & Transitions received the lowest positive RR of 30%. This may not be quite similar to the comparative countries but was also found in areas in dimension 10 as deficient (positive RR of <50%).

Indeed, problems are manifold in Vietnamese health care. These problems can be clustered into 2 types including management-based and human-based challenges. One of the most significant complications in the core Vietnamese institutions regarding management is that the medical infrastructural level cannot withstand overcrowding, the solutions to which are in progress.[76] Moreover, the serving behavior of health care providers toward patients has become a critical problem in the country. This problem has now been addressed as

*Table 8 Continued*

| | | | | |
|---|---|---|---|---|
| **8. Hospital Management Support for Patient Safety** | **69** | **72** | **37** | **69** |
| F1. Hospital management provides a work climate that promotes patient safety. | 78 | 81 | 35 | 71 |
| F8. The actions of hospital management show that patient safety is a top priority. | 76 | 75 | 47 | 70 |
| F9r. Hospital management seems interested in patient safety only after an adverse event happens. (reverse worded) | 53 | 61 | 29 | 65 |
| **9. Teamwork Across Hospital Units** | **63** | **61** | **44** | **66** |
| F4. There is good cooperation among hospital units that need to work together. | 68 | 62 | 50 | 66 |
| F10. Hospital units work well together to provide the best care for patients. | 79 | 71 | 53 | N/A |
| F2r. Hospital units do not coordinate well with each other. (reverse worded) | 53 | 48 | 38 | N/A |
| F6r. It is often unpleasant to work with staff from other hospital units. (reverse worded) | 50 | 62 | 37 | N/A |
| **10. Hospital Handoffs & Transitions** | **30** | **47** | **48** | N/A |
| F3r. Things "fall between the cracks" when transferring patients from one unit to another. (reverse worded) | 29 | 43 | 46 | N/A |
| F5r. Important patient care information is often lost during shift changes. (reverse worded) | 45 | 53 | 60 | N/A |
| F7r. Problems often occur in the exchange of information across hospital units. (reverse worded) | 26 | 46 | 35 | N/A |
| F11r. Shift changes are problematic for patients in this hospital. (reverse worded) | 21 | 47 | 53 | N/A |
| **11. Frequency of Event Reporting** | **71** | **66** | **35** | N/A |
| D1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? | 77 | 60 | 35 | N/A |
| D2. When a mistake is made, but has no potential to harm the patient, how often is this reported? | 67 | 62 | 33 | N/A |
| D3. When a mistake is made that could harm the patient, but does not, how often is this reported? | 69 | 75 | 37 | N/A |
| **12. Overall Perceptions of Safety** | **53** | **66** | **43** | **55** |
| A15. Patient safety is never sacrificed to get more work done. | 73 | 64 | 59 | N/A |
| A18. Our procedures and systems are good at preventing errors from happening. | 64 | 73 | 44 | 65 |
| A10r. It is just by chance that more serious mistakes don't happen around here. (reverse worded) | 55 | 62 | 38 | 61 |
| A17r. We have patient safety problems in this unit. (reverse worded) | 18 | 65 | 31 | 37 |
| **Patient Safety Grade** | | | | |
| E1. Please give your work area/unit in this hospital an overall grade on patient safety. | | | | |
| (Excellent, Very Good, Acceptable, Poor, Failing) | | | | |
| **Number of Events Reported** | | | | |
| G1. In the past 12 months, how many event reports have you filled out and submitted? | | | | |
| (No event reports, 1 to 2 event reports, 3 to 5 event reports, 6 to 10 event reports, 11 to 20 event reports, 21 event reports or more) | | | | |

[a]: obtained from study [54] | [b]: obtained from study [55] | [c]: obtained from study [56]

US: the United States of America | PS: Palestine | CN: China

Postive response rate on dimension | Postive response rate on item

numerous Vietnamese health care institutions have officially agreed to strive to eradicate the undue influence of staff against patients.[77] Finally, communication styles have been proven to affect the quality of health care, especially the outcomes of discussions about AEs between staff.[78] Specifically, within the Vietnamese culture, open communication about AEs can possibly be hindered by formality, respect, and interpersonal harmony.[78] One of the most problematic points is that subordinates do not normally express disagreement or uncertainty, especially with persons of higher status, to avoid confrontation or signs of disrespect.[79] A yes or any other 1-word answers with an agree meaning between them does not necessarily indicate understanding or agreement; hence, misunderstanding nonverbal cues to questions about diagnosis and treatment has been mistakenly linked with treatment noncompliance.[80–82] In terms of health care–seeking experience, health care providers and patients may not share the same cultural values or communication styles, leading to a misunderstanding between them.[80] As a consequence, AEs will possibly arise. Thus, it is recommended that open-ended questions and answers should be used when discussing diagnosis, treatment, medical errors, or other health issues instead of simple 1-word responses.[78]

Overall, based on the achieved results, the Vietnamese hospitals should strive to establish and maintain (1) a high-performance patient transfer and information exchanging system, (2) a nonpunitive culture, (3) an open and positive error discussion, and (4) effective staff management. Furthermore, building PSC awareness through different levels of education and training will contribute significantly to the system-based transformation. It is assumed that the present health care professionals may take longer to adopt new standardized patient safety initiatives because of a resistance to standardization.[83] Hence, a focus on compulsory graduate medical education in patient safety should be taken into account because this system-based strategy will help to overcome a resistance to the current standardization for the next generation of the health care workforce.[83]

*Strengths and limitations of the study*

With anonymous surveying through a proven valid and reliable instrument, the Vietnamese health care workforce was expected to express true opinions without being influenced by cultural obligation. Hence, as one of the pioneer investigations of this field in Vietnam, the findings may be used as a reference to develop improving initiatives to improve and thus ensure patient safety. However, the study did not reflect the whole picture of the Vietnamese PSC because of the limited number of participants and settings. Furthermore, due to inadequate information about the financial autonomy of the hospitals, no notion about the relationship between this financial status and PSC was determined.

## Conclusions and Implications for Practice

The findings assume that the psychometric properties of the translated version of HSOPSC, the E-V HSOPSC, are understandable and appropriate to use for evaluating the PSC in Vietnamese health care institutions. Indeed, due to the concise coverage of a broad range of major PSC issues, the instrument can fully and accurately reflect the opinions of health care workforce concerning their organizational safety culture, which is required for effective interventions on deficient areas of safety. Further, it is also suitable for public health or clinical researchers to conduct cross-national and time-to-time benchmarking. For Vietnam, the safety was considered very good to excellent by 58.1% of respondents, and approximately four-fifths reported 1 or more events in the last 12 months. In general, 58.9% of the workforce felt positively toward PSC. The data suggest that Vietnamese health care authorities should attempt to investigate and address the problems in Communication Openness, Nonpunitive Response To Error, Staffing, and Hospital Handoffs & Transitions. Nonetheless, the E-V HSOPSC needs to be continuously validated in larger samples in different regions and contexts, as well as over time to gain a more in-depth knowledge about the PSC and to verify whether appropriateness for the Vietnamese sample still exists or whether further refinements are required.

## Acknowledgments

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