

Attitudes Toward Standard Precautions and Associated Factors Among Nurses at Hai Phong Pediatric Hospital in 2026

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ABSTRACT

Objectives: To assess nurses' attitudes toward standard precautions at Hai Phong Children's Hospital in 2026 and identify associated factors. **Methods:** A cross-sectional study was conducted among 242 nurses from January to June 2026. Attitudes were measured using 22 Likert-scale items and dichotomized into positive (agree/strongly agree = 1) and negative (disagree/strongly disagree = 0). Adequate attitude was defined as a total score ≥ 16 (70%). Data were analyzed using descriptive statistics, Chi-square/Fisher's exact tests, and multivariable logistic regression. **Results:** The mean attitude score was 13.31 ± 4.30 (out of 22), with 41.7% of nurses demonstrating adequate attitudes. Several items showed low agreement rates, indicating suboptimal perceptions toward standard precautions. Work-related stress significantly reduced the likelihood of having a positive attitude (aOR = 0.19; $p < 0.001$). Training based on Decision No. 3671/QD-BYT was also associated with nurses' attitudes ($p < 0.001$). A moderate negative correlation between knowledge and attitude was observed ($r = -0.537$; $p < 0.001$). **Conclusions:** Nurses' attitudes toward standard precautions were moderate but suboptimal. Interventions should extend beyond knowledge improvement to include workplace environment enhancement and stress reduction strategies.

Keywords: attitude, standard precautions, nurses, infection control, Vietnam

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INTRODUCTION

Healthcare-associated infections (HAIs) remain a major global public health challenge, contributing to increased morbidity, mortality, prolonged hospital stays, and higher healthcare costs. Standard precautions (SPs) are considered the cornerstone of infection prevention and control, as they are designed to reduce the risk of transmission of infectious agents in healthcare settings regardless of patients' diagnosis or infection status [1,2]. Despite clear guidelines, adherence to SPs among healthcare workers remains inconsistent,

particularly in low- and middle-income countries.

While knowledge of SPs is essential, growing evidence suggests that attitudes toward infection prevention play a critical role in shaping compliance behaviors. Studies have shown that healthcare workers' perceptions, beliefs, and motivation significantly influence their willingness to adhere to SPs [1,2]. For example, research in Northern Cyprus and Nigeria demonstrated variability in knowledge and attitudes among healthcare workers, with suboptimal attitudes contributing to poor compliance

with infection control practices [1,3]. Similarly, studies conducted during the COVID-19 pandemic highlighted that healthcare workers' attitudes and beliefs regarding personal protective equipment (PPE) directly affected their usage and adherence [4,5].

Among nurses, who are in continuous and close contact with patients, attitudes toward SPs are particularly important. Evidence from intensive care and oncology settings indicates that work environment, perceived risk, and organizational support significantly influence nurses' attitudes and compliance with SPs [6–8]. In addition, educational interventions alone may not be sufficient to improve attitudes unless combined with behavioral and organizational strategies [9]. In Vietnam, several studies have assessed knowledge and attitudes toward SPs, reporting moderate knowledge levels but inconsistent attitudes among nurses. A recent study conducted at the National Endocrinology Hospital found that although nurses had relatively good knowledge, their attitudes toward SPs were not optimal, suggesting a gap between cognition and perception [10]. However, most studies in Vietnam have focused on knowledge or combined knowledge–practice assessments, with limited attention to attitudes as a distinct outcome.

Hai Phong Pediatric Hospital is a tertiary pediatric hospital where nurses are frequently exposed to infectious risks due to high patient density and the nature of pediatric care. In such settings, maintaining a positive attitude toward SPs is essential for ensuring patient safety and preventing cross-infection. To date, there has been limited evidence examining nurses' attitudes toward SPs in pediatric hospitals in Vietnam. Therefore, this study aimed to:

(1) assess nurses' attitudes toward standard precautions at Hai Phong Pediatric Hospital in 2026; and

(2) identify factors associated with attitudes toward standard precautions among nurses.

METHODS

Study design and setting

A cross-sectional analytical study was conducted at Hai Phong Pediatric Hospital, Vietnam, from January to June 2026.

Participants and sampling

All registered nurses working in clinical and paraclinical departments during the study period were eligible. Inclusion criteria were: (1) currently employed nurses and (2) willingness to participate. Nurses who were absent during data collection or returned incomplete questionnaires were excluded. A total of 242 nurses were included using a census sampling approach.

Data collection and instruments

Data were collected using a self-administered structured questionnaire consisting of two parts:

Part A: Demographic and occupational characteristics (age, sex, education level, years of experience, workload, training, and work-related stress).

Part C: Attitudes toward standard precautions, including 22 items measured on a 4-point Likert scale (strongly agree, agree, disagree, strongly disagree).

Measurement of variables

Outcome variables

Attitude toward standard precautions

Each item was dichotomized as follows: Agree/strongly agree = 1 point; Disagree/strongly disagree = 0 points; Total score ranged from 0 to 22.

Attitude was categorized as: Adequate attitude: ≥ 16 points ($\geq 70\%$); Inadequate attitude: < 16 points.

Independent variables

Demographic factors: age, sex

Professional factors: education level, years of experience, workload (>10 patients/day)

Work-related factors: perceived work-related stress

Training-related factors: participation in standard precaution training, receipt of training materials, and training based on Decision No. 3671/QD-BYT.

Statistical analysis

Data were entered and analyzed using SPSS software 21.0.

Descriptive statistics: frequency, percentage, mean $\pm$ standard deviation (SD), median and interquartile range (IQR)

Bivariate analysis: Chi-square test or Fisher's exact test to assess associations between independent variables and attitude categories.

Multivariable analysis: logistic regression to identify factors associated with adequate attitude, presented as adjusted odds ratios (aORs) with 95% confidence intervals (95% CIs)

Correlation between knowledge and attitude scores was assessed using Spearman's rank correlation coefficient. A p-value <0.05 was considered statistically significant.

Ethical considerations

The study was approved by the Institutional Review Board of Hai Phong University of Medicine and Pharmacy and the Board of Directors of Hai Phong Children's Hospital. Participation was voluntary, and informed consent was obtained from all participants. Data confidentiality and anonymity were strictly maintained.

RESULTS

Table 1. Characteristics of study participants (n = 242)

Characteristics	n	%
Sex		
Male	21	8.7
Female	221	91.3
Age group (years)		
<30	11	4.5
30–39	159	65.7
40–49	61	25.2
≥ 50	11	4.5
Education level		
Secondary	2	0.8
College	205	84.7
University	35	14.5
Years of experience		
≤ 5 years	14	5.8
6–10 years	45	18.6
11–15 years	118	48.8
>15 years	65	26.9
Work-related stress		
Yes	62	25.6

No	180	74.4
Received SP training	202	83.5
Received SP materials	209	86.4
Training based on Decision 3671	159	65.7

Comment: The majority of participants were female, aged 30–39 years, and had college-level education. Most nurses had received training and materials on standard precautions, although standardized training was less common.

Table 2. Attitude scores toward standard precautions

Indicator	Value
Mean ± SD	13.31 ± 4.30
Median (IQR)	13 (10–16)
Min–Max	1 – 22
Adequate attitude (≥16)	101 (41.7%)
Inadequate attitude (<16)	141 (58.3%)

Comment: Only 41.7% of nurses demonstrated adequate attitudes toward standard precautions, indicating a moderate but suboptimal level overall.

Table 3. Univariable logistic regression analysis of factors associated with adequate attitude

Variables	OR	95% CI	p-value
Sex (Female vs Male)	1.28	0.49 – 3.32	0.610
Age (≥40 vs <40)	0.92	0.51 – 1.65	0.780
Education (University vs ≤College)	1.34	0.66 – 2.73	0.410
Experience (≥10 years vs <10 years)	1.21	0.67 – 2.18	0.520
Workload (>10 patients/day)	1.39	0.78 – 2.46	0.260
Work-related stress (Yes vs No)	0.24	0.12 – 0.48	<0.001
Received SP training (Yes vs No)	0.87	0.32 – 2.33	0.780
Received SP materials (Yes vs No)	0.41	0.11 – 1.47	0.170
Training based on Decision 3671 (Yes vs No)	0.28	0.16 – 0.49	<0.001

Comment: In univariable analysis, work-related stress and training based on Decision No. 3671/QD-BYT were significantly associated with attitudes toward standard precautions. Nurses experiencing stress were less likely to demonstrate adequate attitudes. Other variables, including demographic and professional characteristics, were not significantly associated.

Table 4. Multivariable logistic regression of factors associated with adequate attitude

Variables	aOR	95% CI	p-value
Workload (>10 patients/day)	1.46	0.69 – 3.10	0.320
Received SP training	0.80	0.18 – 3.45	0.763
Received SP materials	0.33	0.07 – 1.62	0.173
Training (Decision 3671)	0.19	0.10 – 0.36	<0.001
Work-related stress	0.19	0.08 – 0.44	<0.001

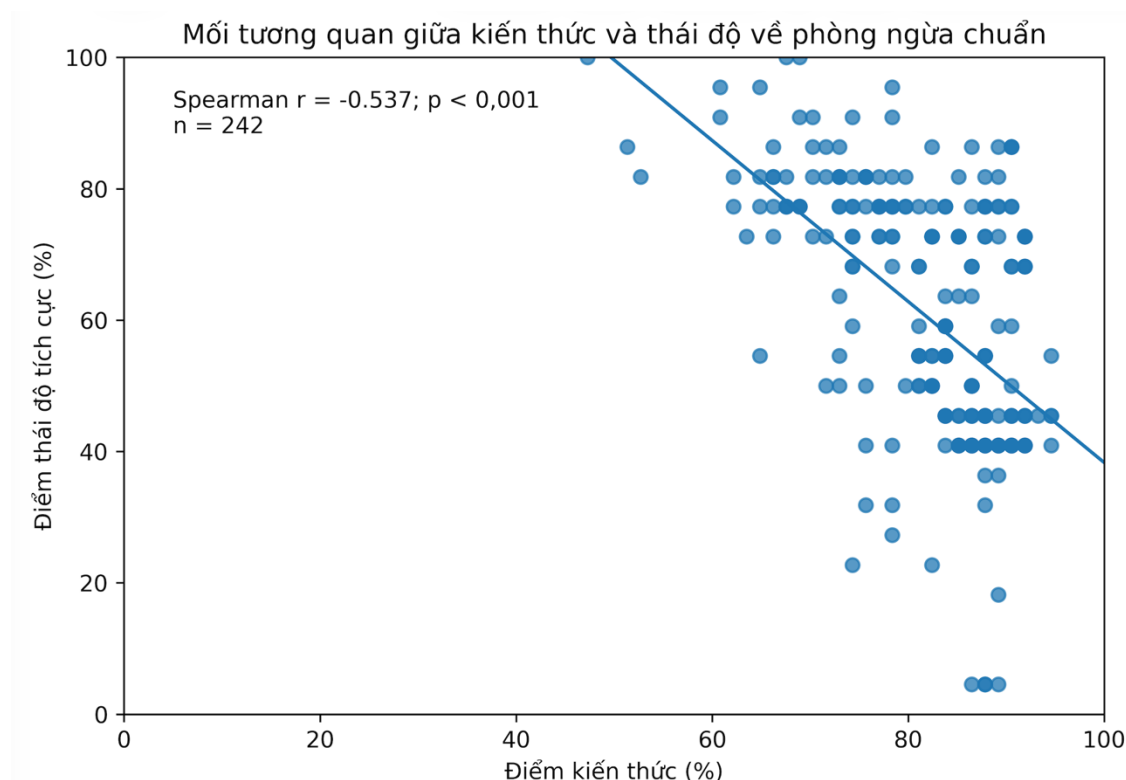


Figure 1. Correlation between knowledge and attitude scores toward standard precautions among nurses.

Comment: A statistically significant moderate negative correlation was observed between knowledge and attitude scores (Spearman's $r = -0.537$; $p < 0.001$), indicating that higher knowledge levels did not correspond to more positive attitudes.

DISCUSSION

This study found that only 41.7% of nurses demonstrated adequate attitudes toward standard precautions (SPs), despite relatively high levels of knowledge reported in the companion analysis. This finding indicates that attitudes toward SPs among nurses at Hai Phong Pediatric Hospital are moderate but suboptimal, highlighting a persistent gap between knowledge and behavioral readiness. Similar patterns have been reported in previous studies, where healthcare workers exhibited acceptable knowledge but less favorable attitudes, ultimately affecting compliance with infection prevention practices [1,10].

A key finding of this study is the moderate negative correlation between knowledge and attitudes ($r = -0.537$; $p < 0.001$). This

counterintuitive relationship suggests that higher knowledge does not necessarily translate into more positive attitudes. Previous research has also emphasized that knowledge alone is insufficient to ensure adherence to SPs, as attitudes are influenced by a complex interplay of cognitive, behavioral, and environmental factors [1,2]. For example, Al-Faouri et al. demonstrated that compliance with SPs is not solely dependent on knowledge but also on nurses' perceptions, motivation, and workplace conditions [2]. Similarly, Abuduxike et al. reported that knowledge, attitudes, and practices may not progress linearly, indicating the presence of gaps between these domains [1].

Work-related stress emerged as the most significant factor associated with attitudes in

this study, with stressed nurses being significantly less likely to demonstrate adequate attitudes (aOR = 0.19; $p < 0.001$). This finding is consistent with evidence from intensive care and high-risk clinical settings, where heavy workload, psychological pressure, and fatigue negatively affect healthcare workers' attitudes and adherence to SPs [7,8]. In pediatric hospitals, where nurses are frequently exposed to high patient loads and emotionally demanding situations, stress may play a particularly critical role in shaping attitudes toward infection prevention.

Training based on Decision No. 3671/QĐ-BYT was also significantly associated with attitudes. Although the direction of association requires careful interpretation depending on variable coding, this finding reinforces the importance of standardized and structured training programs. Previous studies have shown that well-designed training interventions can improve not only knowledge but also attitudes and behavioral intentions toward infection control [9]. However, training effectiveness depends on delivery methods; interactive and practice-based approaches are more effective than passive knowledge transfer [9].

Item-level analysis further revealed that several attitude statements had low agreement rates, suggesting persistent misconceptions or low perceived importance of certain SP components. Similar findings were reported in studies conducted during the COVID-19 pandemic, where healthcare workers demonstrated gaps in risk perception and inconsistent beliefs about the use of personal protective equipment (PPE) [4,5]. These gaps highlight the need for targeted behavioral interventions rather than solely informational approaches.

From a broader perspective, these findings support behavioral theories suggesting that attitudes are shaped not only by knowledge but also by environmental and organizational factors. Studies in various healthcare settings have emphasized the role of workplace culture, institutional support, and perceived safety climate in influencing attitudes and compliance with SPs [2,8]. Therefore, improving attitudes requires a multidimensional strategy, including reducing workload, enhancing workplace conditions, and fostering a culture of safety. This study has several limitations. First, the cross-sectional design does not allow causal inference. Second, self-reported data may be subject to social desirability bias. Third, the study was conducted in a single pediatric hospital, which may limit generalizability. Despite these limitations, the study provides important insights into the attitude-related challenges of infection prevention in a high-risk clinical setting.

CONCLUSION

In summary, nurses' attitudes toward standard precautions remain suboptimal, with a clear gap between knowledge and attitudes. Addressing this gap requires not only educational interventions but also organizational and behavioral strategies targeting workplace stress and safety culture.

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