Analysing trends of Patient Safety Non-Technical Skills among postgraduate trainees through a modified survey tool

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Abstract

Objective: To analyse practices of patient safety non-technical skills among postgraduate trainees to establish the utility of organised teaching programmes in this regard, and to determine the utilisation of different teaching modes.

Method: The multicentre, two-phase, cross-sectional study was conducted from February to August 2020 at 27 teaching hospitals across Pakistan which were part of the Patient Safety Friendly Hospital Initiative by the World Health Organisation. The Hospital Survey on Patient Safety Culture was modified with validated additional survey items before using it to gather relevant data. Data was analysed using SPSS 21.

Results: In the first phase, 42 additional survey items were developed with content validity ratio >0.66 and item content validity index >0.83. Cronbach's alpha of the modified survey tool was 0.790. The second phase comprised 388 postgraduate trainees; 199(51.3%) males and 189(48.7%) females. Of them, 134(34.5%) were in the third year of training, 215(55.4%) fourth, and 39(10.1%) in the final year. Highest positive response was found for learning Teamwork 216(55.7%) and the lowest for Situational Awareness 62(15.9%). Leadership had highest good practice responses (subscales range: 77.6% to 76.6%) and Communication had the lowest (subscales range: 16.5% to 74.2%). Agreement on Informal Learning mode was the highest 268(69.1%) and the lowest was for Simulator Learning 63(16.2%). Besides, 274(70.6%) and 281(72.4%) subjects agreed on the supportive role of supervisors and hospital administrations. The correlation of the studied variables with the year of training was significant only for Teamwork (p=0.02) and Medication Safety skills (p=0.01).

Conclusion: Modified Hospital Survey on Patient Safety Culture could be used as a benchmark for evaluating patient safety teachings and practices. Significance of patient safety non-technical skills was established with limited evidence for the utility of organised teaching programmes.

Keywords: Patient safety non-technical skills, Postgraduate trainees, Low- and middle-income countries.

Introduction

Patient Safety (PS), a mandatory component of quality healthcare, is the prevention of patient-related adverse events resulting from the processes of healthcare delivery. Clinicians must acquire core concepts of PS, including technical as well as non-technical skills (NTSs), in order to improve their skills as clinicians and to improve the working environment of their institutions. PS NTS are the cognitive, social and personal resource skills that complement technical skills, and contribute to safe and efficient task performance. Eight PS NTS domains were broadly identified through literature search, including Leadership, Adverse Event Reporting, Communication, Working Safely, Medication Safety, Situational Awareness, Teamwork and System-Based Practice skills. 1-5, 6-8. Significant reduction from 18.5% to 13% in errors caused by healthcare staff was noticed following PS NTS courses in hospitals.[1] Data to support the efficacy of these strategies is still deficient.[2] Postgraduate trainees (PGTs) play a pivotal role in

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implementing PS measures, being in the forefront of dealing with patients, and must undergo PS NTS training.[2] The challenge is how to implement PS NTS among doctors as these are not considered a mandatory requirement in hospitals the world over.[1-7]

There is a lack of comprehensive studies to evaluate PS NTS among junior doctors as there is no specific validated measuring tool.[8] Breakdown in multiple domains of these skills still remains a root cause of harm to patients as PS training is deficient in postgraduate curricula.[9] The role of supervisors to train PGTs on PS is also found deficient.[10] Organisational factors to influence the implementation of teaching PS NTSs to hospital staff are also not clear.

Studies on practices of PS NTS and their teaching programmes in hospitals of low- and middle-income countries (LMICs) are extremely deficient.[4] In Pakistan, limited hospital-based studies exist regarding the evaluation of PS NTS attitudes among doctors.[11,12] The World Health Organisation (WHO) has launched a PS Friendly Hospital Initiative (PSFHI) in LMICs which includes 27 postgraduate teaching hospitals in Pakistan.[13,14] No comprehensive report is available on the implementation

of PS culture in these hospitals.

The current study was planned to fill the gap by analysing PS NTS practices among PGTs to establish the utility of organised teaching programmes in this regard, and to determine the utilisation of different teaching modes in this context.

Subjects and Methods

The multicentre, two-phase, cross-sectional study was conducted from February to August 2020. Hospital Survey on Patient Safety Culture (HSOPSC) v1.0 developed by the Agency for Healthcare Research and Quality (AHRQ), United States of America, and designed for healthcare settings was selected.[13,14] All the identified domains of PS NTS and teaching modalities were not assessed by the tool.[15] A modified AHRQ HSOPSC tool was required for survey on PS practices and teaching modalities among PGTs. After permission from AHRQ to use and modify HSOPSC v1.0 only with addition to the survey items, the additional items were constructed and were subsequently psychometrically validated by a 7-step process.

In step 1 new items were created. Following literature review, 46 additional survey items were constructed in line with Association for Medical Education in Europe (AMEE) Guide 87 guidelines.[16] To the existing domains of Teamwork, System-Based Practices and Communication skills, only items of prevalence of teaching programmes were added. To the domain of Adverse Event Reporting skill, five items were added. Leadership skill was updated with three items, Situational Awareness skill with seven items, Working Safely skill with eleven items, Medication Safety skill with four items, and Teaching Modalities section with eight items.

Step 2 comprised random interviews of participants on conceptualisation of items. Unprompted information was collected from two PGTs each from the departments of General Medicine, General Surgery, Paediatrics, Anaesthesiology and Obstetrics and Gynaecology from Combined Military Hospital Lahore. There was lack of clarity only on items related to Situational Awareness skill.

Step 3 comprised improving item for clarity through repeated interviews of PGTs to achieve saturation. Items under Situational Awareness skill were modified. All relevant definitions were added, and interviews were repeated to achieve saturation on clarity of items.

Step 4 comprised expert view on relevance and essentiality of the additional items. All items were assessed by six experts, including three PS experts and three medical educationists through online Google Forms to establish content validity (CV).

In the fifth step, validity of additional items was quantified and the element of chance was reduced by using calculating Lawshe's content validity ratio (CVR) and item content validity index (I-CVI) for each item.[17,18]

Step 6 comprised pilot testing which was done with 53 subjects from among the targeted population using the modified survey tool to establish internal reliability.

In the final step of the first phase Cronbach's alpha value of the modified survey tool was calculated along with mean inter item correlation values for additional domains and sections.

–The second phase of the study involved PS Culture Survey using the modified HSOPSC. Twenty-seven teaching hospitals across Pakistan which were part of the WHO PSFHI programme were approached. Eighteen hospitals responded and were sent the survey questionnaire. Only 09 hospitals met the eligibility criteria and responded with data.

A quantitative analytical cross-sectional survey was conducted on third, fourth and final year PGTs of the 09 PSFHI hospitals of Pakistan by Simple Random Sampling technique, after ERC approval of author's university. Non-responders were excluded. The sample size was calculated using the formula:

$$n = \frac{p\,(100 - p)\,z^{2\ 19}}{E^2}$$

Socio-demographic data was noted, and responses of PGTs using a Likert scale were taken for PS NTS practices, teaching programmes, teaching modes, role of supervisors, and role of hospital administrations.

Cumulative percentages of the response rate were categorised as 'good' and 'poor', while teaching programmes were categorised as 'organised' and 'not organized'.

Responses role of supervisors, role of hospital administrations and teaching modes were 'disagree', 'agree' and 'neutral'.

Data was analysed using SPSS 21. Chi-square test of association was run between related categorical variables and correlation analysis was run using binary logistic regression. P<0.05 was considered statistically significant.

Results

In the first phase, 42 additional survey items were developed with CVR >0.66 and I-CVI >0.83 (Table 1).

Cronbach's alpha of the modified survey tool was 0.790.

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Table 1: Process of finalisation of additional survey items through content validity ratio (CVR) and item content validity index (I-CVI) metrics.

S. No.	Additional Items Developed	No. of experts marking the item Very Relevant	I-CVI	No. of experts marking the item Essential	CVR	Items retained / eliminated
1.	Teaching programmes have been organized in my hospital to teach Teamwork Skills	6/6	1.0	6/6	1.0	Retained
2.	Teaching programmes have been organized in my hospital to teach System Based Practice to deal with Adverse Events	6/6	1.0	6/6	1.0	Retained
3.	Teaching programmes have been organized in my hospital to teach Communication Skills	6/6	1.0	6/6	1.0	Retained
4	I learn from errors or adverse event happening in my unit due to fault of any member of the staff	4/6	0.66	5/6	0.66	Retained as 5/6 experts agreed on being essential (?80%)
5	Root Cause Analysis is made by my Supervisor / unit head on any adverse event happening in my unit	5/6	0.83	5/6	0.66	Retained as I-CVI was ? 0.79
6	I know how to manage and disclose an adverse event to patient / attendant	5/6	0.83	5/6	0.66	Retained as I-CVI was ? 0.79
7	Patient Safety related preventive measures are discussed in ward rounds / meetings in my unit	5/6	0.83	5/6	0.66	Retained as I-CVI was ? 0.79
8	Teaching programmes have been organized in my hospital to teach Adverse Event Reporting and Learning from them.	6/6	1.00	6/6	1.00	Retained
9	Staff is motivated to report any adverse event	1/6	0.16	2/6	-0.33	Eliminated
10	I use assertiveness when required for better management of patient	5/6	0.83	5/6	0.66	Retained as I-CVI was ? 0.79
11	I assure that the required standards of patient management are maintained	6/6	1.00	6/6	1.00	Retained
12	I prioritize management plans effectively	5/6	0.83	6/6	1.00	Retained
13	Teaching programmes have been organized in my hospital to teach Leadership skills	5/6	0.83	5/6	0.66	Retained
14	Leadership qualities are assessed by seniors	2/6	0.33	2/6	-0.33	Eliminated
15	I always gather appropriate information about my patient's medical problems	6/6	1.00	6/6	1.00	Retained
16	I always recognize and understand the context of patient presentation	6/6	1.00	4/6	0.33	Retained as I-CVI was max (1.00)
17	I can anticipate future clinical state of patient	6/6	1.00	6/6	1.00	Retained
18	I can identify the problems in management of patient	5/6	0.83	6/6	1.00	Retained
19	I can define all options available for management of patient	5/6	0.83	6/6	1.00	Retained

Table 1: *Continued from previous page.*

S. No.	Additional Items Developed	No. of experts marking the item Very Relevant	I-CVI	No. of experts marking the item Essential	CVR	Items retained / eliminated
20	I can balance risks in management of patient	5/6	0.83	3/6	0	Retained as I-CVI was good (0.83)
21	Teaching programmes have been organized in my hospital to teach Situational Awareness skill	6/6	1.00	6/6	1.00	Retained
22	I discuss any change in situation of patient management with other colleagues	1/6	0.16	0/6	-1.00	Eliminated
23	I report every change in situation of patient management to the administration	3/6	0.50	1/6	-0.66	Eliminated
24	I record and communicate information and clinical findings clearly to another team member on handover	5/6	0.83	6/6	1.00	Retained
25	I review patient's medical record before every surgery / procedure / intervention	6/6	1.00	5/6	0.66	Retained as I-CVI was ? 0.79
26	Hand Hygiene is practiced in my unit by all staff members	4/6	0.66	5/6	0.66	Retained as 5/6 of experts agreed on being essential (?80%)
27	Measures for infection prevention and control are practiced in my unit	6/6	1.00	5/6	0.66	Retained
28	I am coping well with my working hours	6/6	1.00	6/6	1.00	Retained
29	I get adequate time to rest in between my duty hours	6/6	1.00	6/6	1.00	Retained
30	Practice of ethical behaviour towards patients / attendants is discussed by my Supervisor	6/6	1.00	5/6	0.66	Retained
31	I always accept only those delegated duties related to patient management which are appropriate to professional competence	5/6	0.83	4/6	0.33	Retained as 5/6 of experts had agreed upon with I-CVI?0.83
32	I reflect to recognize deficiencies in my knowledge keeping patient safety measures in perspective	5/6	0.83	2/6	-0.33	Retained as 5/6 experts agreed upon with I-CVI ?0.83
33	Patient safety Non-technical skills are discussed in Morbidity and Mortality Meetings held in my unit	5/6	0.83	5/6	0.66	Retained as I-CVI was ? 0.79 and 5/6 experts agreed on being essential (?80%)
34	Teaching programmes have been organized in my hospital to teach how to work safely at work place	6/6	1.0	6/6	1.00	Retained
35	I explain in detail the purpose of prescribed medicines to the patient	6/6	1.0	4/6	0.33	Retained as I-CVI was max (1.0)
36	I explain to the patient the dosage of medicines that needs to be taken	6/6	1.0	5/6	0.66	Retained
37	I advise the patient about potential risks involved in over dosage of medication	5/6	0.83	5/6	0.66	Retained as I-CVI was ? 0.79 and 5/6 experts agreed on being essential (?80%)
38	Teaching programmes have been organized in my hospital to teach how to prescribe medication safely	6/6	1.0	6/6	1.00	Retained

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Table 1: *Continued from previous page.*

S. No.	Additional Items Developed	No. of experts marking the item Very Relevant	I-CVI	No. of experts marking the item Essential	CVR	Items retained / eliminated
39	PS NTSs are learnt through Informal Learning Process	6/6	1.0	6/6	1.00	Retained
40	PS NTSs are taught through planned teaching program in my hospital	6/6	1.0	6/6	1.00	Retained
41	Didactic Lectures for PS NTSs are arranged in my hospital	6/6	1.0	5/6	0.66	Retained
42	Small Group Discussions (SGDs) / Tutorials for PS NTSs are arranged in my hospital	5/6	0.83	6/6	1.00	Retained as I-CVI was also ? 0.79
43	Courses / Workshops for PS NTSs are arranged in my hospital	6/6	1.0	5/6	0.66	Retained
44	Bed -side teaching for PS NTSs is practiced by my Supervisor	6/6	1.0	6/6	1.00	Retained
45	Simulators are utilized to learn PS NTSs	5/6	0.83	5/6	0.66	Retained as I-CVI was ? 0.79 and 5/6 experts agreed being essential (?80%)
46	Learning PS NTSs has improved my patient management management of patient	6/6	1.0	6/6	1.00	Retained

Table-2: Reliability analysis of additional domains in modified patient safety (PS) survey tool.

S. No	PS NTS Domain	Number of Items	Mean Inter-Item Correlation (0.2-0.4)		Cronbach Alpha Value (≥ 0.7)	
			Pilot Study	Post Survey	Pilot Study	Post Survey
1.	Modified Survey Tool	82	-	-	0.790	0.958
2.	Adverse event reporting and learning skill	8	0.317	0.416	0.802	0.840
3.	Leadership skill	3	0.084	0.446	0.191	0.669
4.	Situational Awareness skill	6	0.232	0.489	0.199	0.805
5.	Working Safely skill	11	0.245	0.406	0.790	0.872
6.	Medication Safety Skill	4	0.030	0.574	0.211	0.818
7.	Learning Non-Technical Skills for PS	8	0.202	0.457	0.594	0.869

Table-3: Summarised results of highest practice of postgraduate trainees (PGTs) in patient safety non-technical skills (PS NTS) subscales.

PS NTS domains with subscales (N)	No. of domain subscales with highest % of PGTs with		
	Good Practices	Poor Practices	Neutral
Teamwork (04)	03	01	-
Leadership (03)	03	-	-
Situational Awareness (05)	05	-	-
System Based Practices (03)	03	-	-
Medication Safety (03)	02	01	-
Working Safely (10)	10	-	-
Communication (06)	04	02	-
Adverse Event Reporting (07)	04	01	02

The Internal reliability of the modified tool post-survey Showed improved Cronbach's alpha value of 0.96.

The second phase comprised 388 postgraduate trainees; 199(51.3%) males and 189(48.7%) females. Of them, 134(34.5%) were in the third year of training, 215(55.4%) fourth, and 39(10.1%) in the final year.

In terms of PS initiatives being followed at their respective hospitals,314(80.9%) PGTs answered in the affirmative, 24(6.2%) in the negative, and 50(12.9%) said they were not sure. Also PS practice at their respective hospitals was graded excellent by 76(19.6%) PGTs, very good by 195(50.3%), acceptable by 97(25.0%), poor by 19(4.9%) and falling by 1(0.3%). Number of adverse events reported per year was none in 157(40.5%) cases, 1-2 in 132(34.0%), 3-5 in 94(24.2%), 6-10 in 3(0.8%) and 11-20 in 2 (0.5%) cases.

Leadership skill and Medication Safety skill had poor mean inter item correlation scores but with acceptable I-CVI values of their subscales (Table 2).

Cumulative responses were graded for all the eight domains (Table 3).

PS NTS teaching programmes were generally graded negatively (Figure).

Highest positive response was found for learning Teamwork 216(55.7%) and the lowest for Situational Awareness 62(15.9%). Leadership had highest good practice responses (range of subscales: 77.6% to 76.6%) and Communication had the lowest (range of subscales: 16.5% to 74.2%). Agreement on Informal Learning mode was the highest 268(69.1%), followed by 206(53.1%) on Courses and Workshops, 176(45.3%) on Bedside Teachings, 95(24.5%) on Small Group Discussions (SGDs), 68(17.5%) on Didactic Lectures and 63(16.2%) on Simulator Learning.

Besides, 274(70.6%) subjects agreed on the supportive role of supervisors, 291(75%) acknowledged that the supervisors did not push them to work faster under pressure to compromise PS, and 315(81.2%) agreed that the supervisors did not overlook PS problems.

Also, 281(72.4%) PGTs agreed that hospital managements provided a working climate to promote PS, 248(63.9%) agreed that hospital units coordinated well on PS, 254(65.5%) acknowledged that PS was a top priority for hospital managements, and 274(70.6%) PGTs agreed that shift changes in units were not problematic.
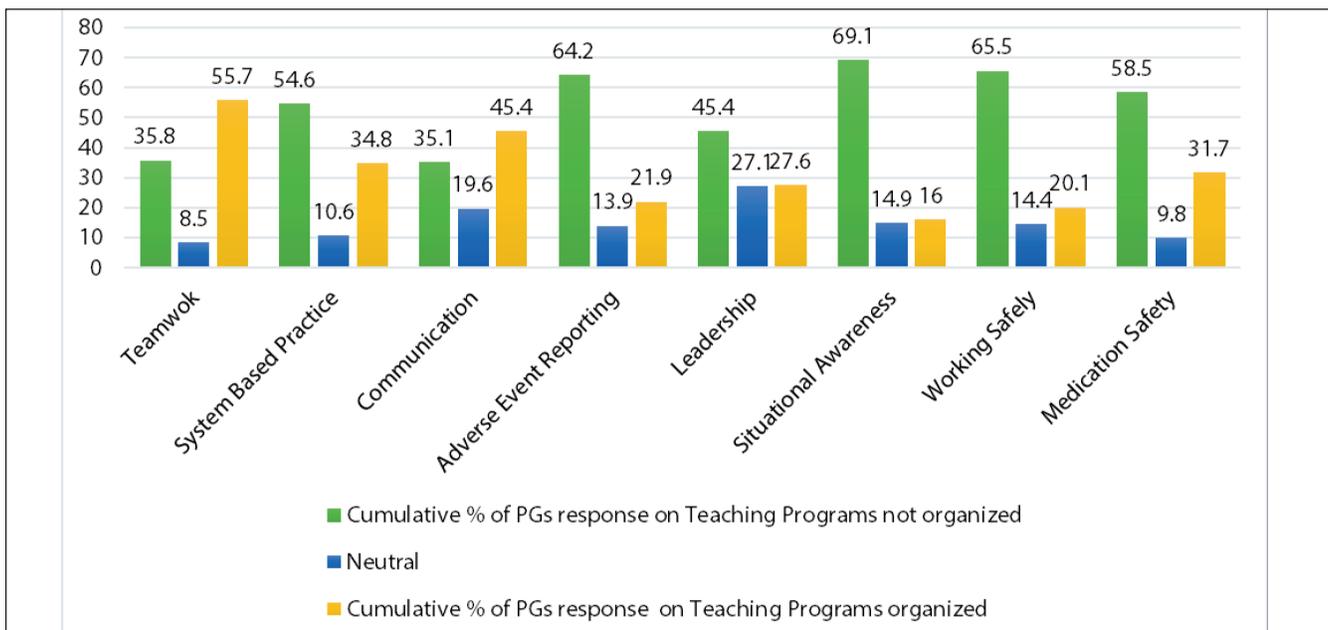

Figure: Cumulative percentage of responses of postgraduate trainees (PGTs) on prevalence of patient safety non-technical skills (PS NTS) teaching programmes.

Table 4: Association between Teaching and practices of adverse event reporting skill and learning from errors and Frequency of adverse events being reported.

Sr. No.	Survey Items related to Adverse Event Reporting NTS	Adverse events reported	Chi-square x2	p-value
1.	When a mistake is made, but is caught and corrected before affecting the patient, it is often reported	61 (46.2%)	49.0	0.000
2.	When a mistake is made, but has no potential to harm the patient, this is reported	42 (31.8%)	66.7	0.000
3.	When a mistake is made that could harm the patient, but does not, it is reported	54 (40.9%)	74.4	0.000
4.	I learn from errors or adverse event happening in my unit due to fault of any member of the staff	99 (75%)	11.2	0.193
5.	Root Cause Analysis is made by my Supervisor / unit head on any adverse event happening in my unit	81(61.4%)	61.8	0.000
6.	I know how to manage and disclose an adverse event to patient / attendant	109 (82.6%)	11.2	0.189
7.	Patient Safety related preventive measures are discussed in ward rounds / meetings in my unit	87 (65.9%)	26.4	0.001
8.	Teaching programmes are organized in my hospital to teach Adverse Event Reporting and Learning from them	37 (28%)	49.0	0.000

Association results for "Improvement of Patient Management through PS NTSs" and "Different Teaching Modes" showed Chi-square for Informal Learning process x^2- 136.9,(p=0.001), Didactic lectures x^2-93.6,(p=0.001), SGDs/tutorials x^2-109.8 (p=0.001), Courses and Workshops x^2-196.6(p=0.001), Bedside Teaching x^2 167.2 (p=0.001) and for Simulators x^2- 64.2 (p=0.001).

"Teaching and practices of Adverse Event Reporting skill" and "Frequency of Adverse Events Reported" also showed significant association (Table 4).

The association between "PS NTS Domain Teachings and Practices" and "Years of postgraduate training" had significant association only in the context of Teamwork (p=0.02) and Medication Safety skills (p=0.01). For the rest of the domains, the correlation with the year of training was not significant (p>0.05)

Binary logistic regression showed the impact of years of PGT on Teamwork skill to be significant (p=0.014); odds ratio [OR] 1.48; 95% confidence interval [CI] 0.970-2.263). The model explained 2.2% (Cox and Snell R square) and 2.9% (Nagelkerke R square) of variance in practicing Teamwork skills. It correctly classified 220(56.7%) of the cases.

The impact of years of PGT on Medication Safety skill was not significant (p=0.938, OR 1.017, 95% CI 0.658-1.574).

Discussion

The first PS NTS survey among PGTs was conducted in United Kingdom in 2013.[8] In Pakistan, a similar study limited to only the Medicine department of a hospital was conducted in 2018.[12] This current study is the first comprehensive research on teaching and practising of PS NTS among PGTs in Pakistan, and used the psychometrically validated modified HSOPSC tool. Low values of inter-item correlation in two domains indicate deficiencies in methodological rigour in designing items due to inadequate subject material.[13]

Most of the PGTs agreed that PS initiatives were being followed in their hospitals 314(80.9%), and 255(65.7%) appreciated good systems and procedures to promote PS, with 241(62.1%) agreeing on active implementation of PS measures. According to 260(67%) PGTs, PS was never sacrificed by them to get more work done in their respective fields, implying that PS measures were being practiced by the PGTs to a significant level.

In a British study, 70% PGTs agreed on good practices of Communication skill.[8] It was ranked third in another study on PGTs in Pakistan.[12] In the current study, PGTs exhibited mixed pattern in the Communication skill subscale. There

was lack of communication with more authoritative senior staff members. Only 176(45.5%) PGTs agreed on organised teaching programmes, implying the need of improved teaching modalities.

In a study on PGTs in Pakistan, practices of Teamwork skill was ranked fourth.[12] In a study in Turkey, the average positive response rate was 82% for all staff, and 75% in a study in Iran.[20] In the current study, 309(79.6%) trainees agreed that the staff worked as a team in crisis, and 216(55.7%) expressed that they were learning Teamwork as the most taught PS NTS. Significant statistical correlation in improvement of Teamwork skill with increasing years of PG training was attempted, but could not be established.

System-based practices are not assessed in many studies as a PS skill. PGTs on average were found to be practising this skill, calling effectively on resources in the system to provide optimum healthcare facilities. Practices were by self-directed as only 135(34.8%) trainees agreed on organised teaching programmes.

In one study in Pakistan, the Situational Awareness skill was ranked first in health practice.[12] In similar studies, it was needed to be enhanced to improve decision-making by trainees working in emergency departments.[6-10] Regarding the Working Safely skill, 227(58.5%) PGTs were coping well with their working hours. Both domains have not been studied much in Asian countries. The PGTs exhibited good practices of both these skills in all subscales. In one study, only 57.4% PGTs reviewed patient's medical history before surgery.[21] In the current study, 341(87.9%) PGTs reviewed patients' medical records before procedures. Regarding ethical behaviour towards patients and personal reflection to recognise deficiencies in PS measures, 177(45.6%) PGTs declared that their supervisors discussed practices of ethical behaviour towards patients, and 212(54.6%) acknowledged practising reflection. Working Safely skill also enhances measures for infection prevention and hand hygiene measures for which good practice of hand hygiene was adopted as 284(73.2%) PGTs confirmed it, and effective infection prevention and control measures were confirmed by 283(72.9%). However, only 62(16%) and 78(20.1%) PGTs confirmed the presence of teaching programmes for both skills, respectively, implying that informal learning process was the practised learning mode.

One study identified the Leadership skill as the fundamental basis of PS culture.[22] Weightage of fifth position was given in a previous study.[12] Although 107(45.4%) PGTs declared having no training programme, they were practicing a leader's role by ensuring the required standards of patient management.

For Medication Safety skill, purpose and dosage of prescribing medicines were explained to patients by only 233(67.8%) and 258(66.5 %) PGTs respectively. Over-dosage risks were either not explained or poorly explained by only 137(43.5%) PGTs. Only 123(31.7%) PGTs declared that teaching programmes were present to teach the skill. Significant statistical correlation of its practices with years of PG training was attempted, but could not be established.

In the present survey, 315(81.2%) PGTs learnt from he errors committed by team members. Only 85(21.9%) emphasised on teaching programmes. As a result, only 157(40.5%) PGTs reported no adverse event, 132(34.0%) reported 1-2 events, and 94(24.2%) reported 3-5 events per year. Significant association was established between frequency of Adverse Event Reporting with practicing and teaching of the skill.

In the United States, only one-quarter of medical schools taught PS with limited hours.[22] In a systematic review on LMICs, no teaching programmes were organised for PS NTS[9] and majority of healthcare institutions were found to be in the planning stages of implementing the PS culture in their respective hospitals.[22] The PGTs were mostly learning PS NTS as part of the hidden curriculum depending on individual, unit and system factors related to their respective work areas, their supervisors and the focus of hospital administration. In the current study, 239(61.6%) PGTs declared no planned teaching programmes, implying that minimum initiatives were being taken by hospitals. Significant statistical association was found for all teaching modes with improvement in patient management which merits their maximum utilisation.

Deficient faculty training contributes to poor implementation of PS culture.[22] In a study in Iran, average positive role of supervisors was acknowledged by 76% hospital staff. In Turkey, it was 52.1%.[15] Positive role of supervisors was identified in the current study, with 315(81.2%) PGTs acknowledging that their supervisors did not overlook PS problems, a possible contributory factor for PGTs' good PS NTS practices.

In a British study, the positive role of management to improve PS was acknowledged by 46% PGTs[8] and a systematic review concluded 72% average positive response by hospital staff.[15] In Iran, it was 65% and in Turkey it was 54.7%.[15] In the current study, 281(72.4%) PGTs agreed that the hospital administrations provided a conducive working climate to promote PS. Overall, 195(50.3%) PGTs graded their hospital as "Very Good" for facilitating a PS culture, 97(25%) graded them "Acceptable" and 76(19.6%) graded them as "Excellent". The WHO PS guide shared with selected hospitals to implement PS culture is a tremendous initiative and must be utilised as a set of guidelines to augment the process. PS survey tools increase awareness among participants[13] with positive responses.

In terms of the limitations of the current study, theoretical deficiencies in literature on elements of PS NTS domains affected the development of survey items. Due to lack of quantitative studies conducted on PGTs for PS NTSs, there was limited statistical data for direct comparison. Weak statistical association between PS NTS practices with years of training merits further inferential analysis of associations and correlations among PS NTS variables.

Conclusion

The modified survey tool may be used as a benchmark for future evaluation of the PS culture. The findings can be used as a baseline set of knowledge for PS curriculum planning. A collaborative effort by medical educationists, supervisors and hospital management is needed to augment workplace PS NTS with rigorous training programmes utilising all the identified modes of training.

Disclaimer: The text is based on a thesis for Masters in Health Professions Education.

Conflict of interest: None.

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