

COMPARISON OF PATIENT SAFETY PERCEPTION IN PRECLINICAL AND CLINICAL STUDENTS

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ABSTRACT

Background: Patient safety is a global problem and patient safety education for medical students is needed to improve the quality of health services. This study aimed to determine the mean difference of perception on nine patient safety key factors between preclinical students and clinical students.

Methods: This observational analytic cross-sectional study was conducted on preclinical students and clinical students at the School of Medicine and Health Sciences of Atma Jaya Catholic University of Indonesia (AJCUI) in the academic year 2019/2020, randomly drawn in each batch. The research data was collected using the Attitude to Patient Safety Questionnaire -III (APSQ-III) with 7 Likert scales. Data analysis using independent t-test.

Results: From 389 students, significant mean differences of patient safety perception between preclinical students and clinical were found for five key factors: PS training received ($p = 0.000$), Error reporting confidence ($p = 0.000$), Working hours as an error cause ($p = 0.000$), Team functioning ($p = 0.001$), and Patient involvement in reducing error ($p = 0.000$).

Conclusion: Medical students had positive perceptions of patient safety. However, there were still some significant different perceptions between clinical and preclinical students, which indicated the need for patient safety education integration in the medical education curriculum.

Keywords: ASPQ-III, Clinical Students, Patient Safety, Perception, Preclinical Students

ABSTRAK

Latar belakang: Keselamatan pasien adalah permasalahan global dan edukasi keselamatan pasien pada mahasiswa kedokteran diperlukan untuk meningkatkan kualitas layanan kesehatan. Penelitian ini bertujuan untuk mengetahui perbedaan rerata persepsi keselamatan pasien pada 9 faktor keselamatan pasien antara mahasiswa preklinik dan klinik.

Metode: Penelitian observasional analitik dengan pendekatan studi potong lintang ini dilakukan pada mahasiswa preklinik dan klinik FKIK Unika Atma Jaya pada tahun ajaran 2019/2020 yang diambil secara acak pada tiap angkatan. Data penelitian diperoleh melalui kuesioner Attitudes to Patient Safety Questionnaire-III (APSQ-III) dengan 7 skala Likert. Analisis data menggunakan uji t-test independent.

Hasil: Dari 389 mahasiswa, diperoleh perbedaan rerata persepsi keselamatan pasien yang signifikan antara mahasiswa preklinik dan klinik pada 5 faktor keselamatan pasien yaitu faktor pelatihan yang didapat mengenai keselamatan pasien ($p = 0,000$), faktor kepercayaan diri dalam melaporkan kesalahan medis ($p = 0,000$), faktor jam kerja sebagai penyebab kesalahan medis ($p = 0,000$), faktor kerja sama tim ($p = 0,001$), dan faktor keterlibatan pasien dalam mengurangi kesalahan medis ($p = 0,000$).

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Kesimpulan: Mahasiswa kedokteran memiliki persepsi positif terhadap keselamatan pasien. Namun masih terdapat beberapa perbedaan persepsi yang signifikan antara mahasiswa klinik dan preklinik yang mengindikasikan diperlukannya integrasi pembelajaran keselamatan pasien pada kurikulum pendidikan kedokteran.

Kata kunci : ASPQ-III, Keselamatan Pasien, Mahasiswa Preklinik, Mahasiswa Klinik, Persepsi

PRACTICE POINTS

- Both preclinical and clinical students had positive perceptions toward patient safety
- There is still a tendency to increase in students' positive perceptions of patient safety from preclinical to clinical stage
- Different perceptions between preclinical and clinical students were found in five key factors: PS training received, Error reporting confidence, Working hours as an error cause, Team functioning, and Patient involvement in reducing error

INTRODUCTION

Patient safety is a global problem that is currently still a concern for many countries in the world. This problem is due to the high number of reported patient claims regarding medical errors.^{1,2} Medical errors may result in permanent injury and an increase in hospitalization time for patients and even may lead to death.² In Indonesia, the incidence of violations against patient safety is still relatively high. These violations can be seen from the increase in number of claims of ‘malpractice’, but the data on Adverse Event and Near-Miss incidents is still low.³

Patient safety itself is one of the standard competence for Indonesian Medical Doctor and patient safety education for medical students has a crucial role to improve the quality of health services.^{4,5} By providing earlier patient safety learning, student's knowledge and attitude toward patient safety can be increased.⁶ A study on how patient safety is placed in Indonesia's medical education curriculum revealed that there were still a lacking “patient” element in the ‘end product’ of the medical education process in Indonesia which have arisen more the concern of patient safety education in Indonesia.⁷

In 2009, WHO released a patient safety curriculum guide to facilitate learning for medical students about

patient safety.^{1,8} It includes 11 materials, starting from what is patient safety, what is the importance of human factors, how to work in teamwork, how to manage clinical risk, control infection, and others.⁹ Before applying a patient safety curriculum, we need to know medical students' patient safety perceptions. By understanding students' perceptions, we may know the students' needs.

Medical students with different backgrounds may have different perceptions of patient safety issues.⁸ One of the background is the medical education level, namely preclinical and clinical. Clinical students have started their education process in teaching hospitals. They have been exposed to the clinical environment and deal directly with patients during the learning process. Meanwhile, preclinical students have not been.¹⁰

Based on researchers' observations and experiences, patient safety education in the Atma Jaya Catholic University of Indonesia (AJCUI) medical curriculum seemed to be slightly and just a glance for example like in the classes of Medicolegal block in the preclinical phase, interprofessional education and clerkship general training right before attending the clinical phase. Considering that the AJCUI does not have a patient safety curriculum yet, through this

study, researchers wanted to find out the differences in perceptions of preclinical and clinical students toward patient safety. Knowing the perceptions of patient safety that underlie the medical students, later, it can be used as a benchmark in assessing educational needs related to patient safety at the institution in the future.

METHODS

The questionnaire and methodology for this study was approved by the ethics committee of Atma Jaya Catholic University of Indonesia. The research design used was an observational analytic with a cross-sectional approach which was conducted at school of medicines and health sciences of Atma Jaya Catholic University of Indonesia (AJCUI) on preclinical and clinical students in the academic year 2019/2020 with a total sample size 389 respondents. The sample was taken randomly in each batch according to calculations using the probability proportional to size (PPS) sampling method, with the results: 258 preclinical students consisting of batch 2016 (67 people), 2017 (61 people), 2018 (65 people), 2019 (65 people), and 131 clinical students consisting of batch 2014 (68 people) and 2015 (63 people).

Samples taken were samples that met the inclusion and exclusion criteria. This study's inclusion criteria were: the respondents were preclinical and clinical students of AJCUI in the academic year 2019/2020, consisting of 2014, 2015, 2016, 2017, 2018, and 2019 with active status. The exclusion criteria were respondents who were unwilling to participate in the study, and respondents who had attended formal patient safety training.

Data collection was carried out by researchers using an informed consent as a statement of consent following the study and the Attitudes to Patient Safety Questionnaire-III (ASPQ-III) questionnaire to assess perceptions of patient safety. The ASPQ-III questionnaire consists of 26 questions that represent 9 patient safety key factors. The questionnaire uses a scoring system based on a Likert scale, starting from 1 (strongly disagree) to 7 (strongly agree). There is a reversed scoring system (R) in question number 11, 13-18, and 25. Each response was then averaged into

9 means representing 9 patient safety key factors. The data analysis used in this study was the independent t-test with $\alpha = 95\%$, which is statistically significant if the p - value is <0.05 .

This study was granted an ethical approval from ethical committee of AJCUI (NO: 01/12/KEP-FKUAJ/2019).

RESULTS AND DISCUSSION

Of the 389 respondents involved in the study, 131 respondents (33.7%) were clinical students, and 258 respondents (66.3%) were preclinical students with a response rate of 100%. The respondents' characteristics selected in this study were students who had never received formal training of patient safety. Research respondents were more dominated by female gender in the two study groups (Preclinical 72.48%; Clinical 66.41%). In the batch characteristics, preclinical students dominated the batch (see Table 1).

Table 1. Respondent Characteristics

Characteristics	Preclinical		Clinical		
	N	%	N	%	
Gender	Male	71	27.52	44	33.59
	Female	187	72.48	87	66.41
Batch	2014	-	-	68	51.91
	2015	-	-	63	48.09
	2016	67	25.97	-	-
	2017	61	23.64	-	-
	2018	65	25.19	-	-
	2019	65	25.19	-	-
	Total	258	66.3	131	33.7

Significant mean differences between the preclinical and clinical were found for ten items in ASPQ-III. These included one of the three items on PS training received (item 2), all three items on Error reporting confidence (items 4-6), all three items on Working hours as an error cause (items 7-9), one of the two items on Team functioning (item number 20), and all two items on Patient involvement in reducing error (items 22-23). There were no significant differences found for the remaining 16 items. (see Table 2).

Table 2. Comparison of Patient Safety Perceptions in Preclinical and Clinical Students

No	Items	Mean/SD Preclinical students	Mean/SD Clinical students	Mean Total	p -value
1	My training is preparing me to understand the causes of medical errors	5.84 ± 0.95	5.78 ± 1.01	5.82 ± 0.97	0.550
2	I have a good understanding of PS issues as a result of my undergraduate medical training*	4.76 ± 1.23	5.40 ± 1.15	4.98 ± 1.24	0.000
3	My training is preparing me to prevent medical errors	5.87 ± 1.00	6.06 ± 0.90	5.93 ± 0.97	0.065
4	I would feel comfortable reporting any errors I had made, no matter how serious the outcome had been for the patient*	4.66 ± 1.34	5.22 ± 1.17	4.85 ± 1.31	0.000
5	I would feel comfortable reporting any errors other people had made, no matter how serious the outcome had been for the patient*	4.39 ± 1.36	4.90 ± 1.22	4.57 ± 1.34	0.000
6	I am confident I can talk openly to my supervisor about an error I had made even if it resulted in potential or actual harm to my patient*	4.72 ± 1.26	5.16 ± 1.22	4.87 ± 1.26	0.001
7	Shorters shifts for doctors will reduce medical errors*	5.51 ± 1.31	5.97 ± 1.17	5.66 ± 1.28	0.001
8	By not taking regular breaks during shifts, doctors are at an increased risk of making errors*	5.68 ± 1.17	6.14 ± 0.87	5.83 ± 1.10	0.000
9	The number of hours' doctors work increases the likelihood of making medical errors*	5.55 ± 1.17	5.96 ± 1.00	5.69 ± 1.13	0.001
10	Even the most experienced and competent doctors make errors	6.08 ± 0.97	6.11 ± 0.94	6.09 ± 0.96	0.750
11	A true professional does not make mistakes or errors (R)	2.97 ± 1.48	2.98 ± 1.64	2.97 ± 1.53	0.962
12	Human error is inevitable	5.22 ± 1.48	5.35 ± 1.43	5.26 ± 1.46	0.382
13	Most medical errors result from careless nurses (R)	3.70 ± 1.21	3.80 ± 1.44	3.74 ± 1.29	0.456
14	If people paid more attention at work, medical errors would be avoided (R)	5.43 ± 1.12	5.56 ± 1.14	5.47 ± 1.13	0.283
15	Most medical errors result from careless doctors (R)	4.31 ± 1.35	4.09 ± 1.48	4.23 ± 1.40	0.146
16	Medical errors are a sign of incompetence (R)	3.59 ± 1.36	3.43 ± 1.49	3.53 ± 1.41	0.298
17	It is not necessary to report errors which do not result in adverse outcomes for the patient (R)	3.46 ± 1.40	3.34 ± 1.50	3.42 ± 1.44	0.447
18	Doctors have a responsibility to disclose errors to patients only if the errors result in patient harm (R)	4.14 ± 1.32	4.04 ± 1.50	4.11 ± 1.38	0.512
19	All medical errors should be reported	5.21 ± 1.24	5.25 ± 1.27	5.22 ± 1.25	0.795
20	Better multidisciplinary teamwork will reduce medical errors*	5.90 ± 0.98	6.20 ± 0.90	6.00 ± 0.97	0.004
21	Teaching students teamwork will reduce medical errors	5.81 ± 0.98	6.02 ± 1.02	5.88 ± 1.00	0.056
22	Patients have an important role in preventing medical errors*	5.22 ± 1.19	5.58 ± 1.15	5.34 ± 1.19	0.004
23	Encouraging patient to be more involved in their care can help to reduce the risk of medical errors occurring*	5.56 ± 1.07	5.83 ± 1.00	5.65 ± 1.05	0.016
24	Teaching student about PS should be an important priority in medical students training	6.02 ± 0.95	6.10 ± 0.93	6.05 ± 0.94	0.433
25	PS issues cannot be taught, they can only be learned through clinical experience, which is gained when one is qualified (R)	4.62 ± 1.43	4.39 ± 1.69	4.54 ± 1.52	0.166
26	Learning about PS issues before I qualify will enable me to become a more effective doctor	5.94 ± 0.95	5.99 ± 0.92	5.96 ± 0.94	0.673

Positive = score>4, Netral (N) = score 4, Negative = score<4; * p < 0.05 ; t-test Independent

From nine patient safety factors, statistically significant mean differences of patient safety perceptions between preclinical students and clinical students were found for five key factors: PS training received factor ($p = 0.000$), Error reporting

confidence ($p = 0.000$), Working hours as an error cause ($p = 0.000$), Team functioning factor ($p = 0.001$), and Patient involvement in reducing error ($p = 0.000$). (see Table 3).

Table 3. Comparison of Nine Patient Safety Key Factors in Preclinical and Clinical Students

No	Key Factor	Items	Mean			p-value
			Preclinical	Clinical	Total	
1	PS training received*	1-3	5.49 ± 1.18	5.75 ± 1.06	5.58 ± 1.15	0.000
2	Error reporting confidence*	4-6	4.59 ± 1.33	5.09 ± 1.21	4.76 ± 1.31	0.000
3	Working hours as an error cause*	7-9	5.58 ± 1.22	6.03 ± 1.02	5.73 ± 1.18	0.000
4	Error inevitability	10-12	4.75 ± 1.87	4.81 ± 1.91	4.77 ± 1.88	0.610
5	Professional incompetence as an error cause	13-16	4.26 ± 1.46	4.22 ± 1.61	4.24 ± 1.51	0.663
6	Disclosure responsibility	17-19	4.27 ± 1.50	4.21 ± 1.63	4.25 ± 1.55	0.532
7	Team functioning*	20-21	5.86 ± 0.98	6.11 ± 0.97	5.94 ± 0.98	0.001
8	Patient involvement in reducing error*	22-23	5.39 ± 1.14	5.71 ± 1.08	5.50 ± 1.13	0.000
9	Importance of PS in the curriculum	24-26	5.53 ± 1.30	5.49 ± 1.46	5.52 ± 1.35	0.679

Positive = score > 4, Neutral (N) = score 4, Negative = score < 4; * $p < 0.05$; t-test independent

A significant mean difference in PS training received ($p = 0.000$) was found. Clinical students felt that they had received more training about patient safety than preclinical students, even though the two study groups had not learned systematically about patient safety from the curriculum yet. This finding contradicts the study results in China, where clinical students tended to give lower positive responses than preclinical students on patient safety training received factor.¹¹ A probable reason for this finding is that in our institution, there is such a briefing about patient safety right before the clinical students work in the teaching hospitals and are sporadically reminded by academic supervisors which can make the clinical students become more aware about patient safety issues. However, this finding does not rule out the probability of misunderstanding or failure to distinguish the teaching obtained in the curriculum from what they had established from the public media, proposed by a previous study by Leung et al in Hong Kong.⁸

A significant mean difference was also found in error reporting confidence ($p = 0.000$), where clinical students had a more positive perception of reporting medical errors than preclinical students. This could happen due to before entering the clinical setting,

clinical students must pass through several stages and requirements, consisting: 1) students have graduated with a medical degree, 2) passed OSCA (Objective Structured Clinical Assessment) and OSCE (Objective Structured Clinical Examination) comprehensive exams, 3) have attended a clerkship general training, and 4) reciting the vow of young doctors. These could make clinical students become more prepared for their knowledge, skills, and mentality when working in a clinical environment. Then, having practical experience in teaching hospitals may also allow clinical students to be more exposed to the hospital's medical error reporting system. This finding contradicts the study results in China, where clinical students had a less positive perception of reporting medical errors. The probable reasons proposed by Liu et al is due to a possibility that clinical students get a negative impact from the experience of working in a higher clinical hierarchy, which allows them to be more afraid or less confident in reporting medical errors. It can also occur due to the inadequate training dan young doctor preparation results.¹¹

Students also have positive perceptions of patient involvement in reducing medical errors factor. This finding is similar to the study results in China

and Pakistan, but contrary to medical students in Hong Kong.^{8,11,12} A probable reason for this finding proposed by Liu et al is that patients in Hong Kong cannot choose their own doctors and they must adhere to public medical institutions for the illness-specific arrangements.¹¹ In Indonesia, the patient has the right to choose their own doctor independent if they pay by themselves, but this does not apply when the patient use BPJS Kesehatan (Healthcare and Social Security Agency). The patients and their families are also often encouraged by the medical staff to participate in medical decision-making, diagnosis, and treatment-related procedures together. Then, we also found a significant difference between preclinical and clinical students with a *p* value of 0.000. Clinical students have a more positive perception than students preclinical in the importance of patient involvement. This may occur because clinical students have dealt directly with patients in their practice in the clinical environment so they can feel more the importance of patient contributions in the health service system, especially in reducing medical errors.¹³ In contrast, clinical students in China gave lower positive responses than preclinical students although medical students in mainland China generally showed positive attitudes for this domain.¹¹

The most positive perception was found on the team functioning factor, followed by the working hour as an error cause with mean values of 5.94 and 5.73. These findings have the same results as the study conducted in Pakistan. But slightly different from the study results in Hong Kong and Singapore medical students, where the teamwork factor results had the lowest positive value while the work hours factor as the cause of medical errors was the most positive.^{8,12} Even though students showed the most positive perceptions towards these factors, we found significant mean differences in perceptions between preclinical and clinical students on the team functioning factor (*p* = 0.001) and working hours as an error cause (*p* = 0.000). Clinical students had more positive perceptions than preclinical students on these two factors. In the team functioning factor, clinical students give a more positive response than preclinical students. It may occur because clinical students begin to work together with other

medical professionals to provide health services to patients. This could make clinical students feel more teamwork's importance, especially in minimizing medical errors caused by miscommunication and misunderstanding between medical personnel.¹⁴ Whereas in the working hour as an error cause, clinical students gave a more positive response, perhaps because clinical students have experienced working hours rotation during their clinical stage, such as during night shift rotation. It can reduce the student's sleep duration so that students become more tired and sleepy while on standby, making students more at risk of making medical errors.¹⁵ However, these findings still contradict with the study result in China, where clinical students gave lower positive responses than preclinical students in both factors.

Students' positive perceptions of professional incompetence and disclosure responsibility were found lower than other factors, with a mean score of 4.24 and 4.25. Regarding professional incompetence, we found a misconception about the causes of medical errors. Medical students believe that careless nurses than careless doctors more cause medical errors. Here, students believe that medical errors are more caused by individual error rather than a system error. This study's results are similar to study findings in Pakistan.¹² Besides, in the disclosure responsibility, we found a contradiction, where 72.3% of students agreed that all medical errors should be reported, but 52.2% of students thought it is not necessary to report errors that do not result in adverse outcomes for the patient. This may occur because students feel that the patient will not understand or do not want to know about the medical error, then it could also be because the student is afraid that the error will be raised or sued by the patient.¹⁶

It was found that both preclinical and clinical students had a positive perception of the importance of patient safety in the curriculum. This result is consistent with other studies in Pakistan, Hong Kong, Singapore, and Saudi Arabia.^{5,8,12,17,18} However, we found that the positive mean perception is tended to be decreased in clinical students. This decrease has a similar result with the clinical students from China. A likely reason for this finding to be occurred

is due to the tendency of increasing learning and examination pressure faced by medical students so that senior students do not want to add new subjects to their curriculum.¹¹

The good news in this study is that there is still a tendency to increase in students' positive perceptions of patient safety from preclinical to clinical stage. However, we still found a decrease in positive mean perceptions in three patient safety factors: professional incompetence as an error cause, disclosure responsibility, and the importance of PS in the curriculum. In contrast to the study results in China, medical students in China experienced a decrease in positive perceptions of all factors of patient safety as education year increased.¹¹

Overall, it was found that in general, the preclinical and clinical students in had a positive perception of patient safety. These results are consistent with several studies conducted in China and in Pakistan.^{11,12} Even though students have positive perceptions of all patient safety factors, there are still many differences in perceptions and misconceptions between preclinical and clinical students. This may indicate the need for additional learning of patient safety lessons in Indonesia. Introducing patient safety learning in the undergraduate curriculum is a challenge itself and must be tailored to students' needs.^{5,19} The curriculum should focus on the role of students in enhancing patient safety and preventing harm.⁷ It should also be more focused on the confidence to report medical errors, the causes of medical errors, the importance of teamwork, and the role of patient involvement in reducing error as found in this study. One of the curriculum guides that can be used as a reference is the patient safety curriculum guide developed by WHO. We recommend that the curriculum to be implemented in all medical schools existing in Indonesia to improve medical quality in healthcare while recognising the local context of Indonesia.^{7,19,20}

This study has several limitations. First, there is a gap in the number of samples between preclinical and clinical students because of the number of different batches, which may affect the validity of this study's results. Second, this research was only conducted in one medical school in Indonesia.

CONCLUSION

Preclinical and clinical students have a positive perception of patient safety. However, there are still some significant differences in the five mean perceptions of the nine patient safety key factors: PS training received, error reporting confidence, working hours as an error cause, team functioning, and patient involvement in reducing errors. Additional learning about patient safety is needed in the medical education curriculum in Indonesia. One of the guides that can be used is the WHO patient safety curriculum guide.

RECOMMENDATION

We recommend that WHO patient safety curriculum guide to be integrated into existing medical curricula in all medical faculties in Indonesia to improve the quality of our health services while recognising the local context of Indonesia. Advocate to policy makers and medical schools as stakeholders on the importance of patient safety education in Indonesia. We also suggest that the next researcher who will conduct similar research to compares the patient safety perception between medical faculties in Indonesia.

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COMPETING INTERESTS

The authors declare that there are no competing interests related to the study in this manuscript.

AUTHORS' CONTRIBUTION

Yopi Simargi – conceived of the original idea, study design, data interpretation, and final revision of the manuscript.

Steven Alvianto – conducted data collection, data analysis and interpretation .

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