Pharmacy and Medical Students’ Attitude towards Pharmacist-Physician Collaboration in Malaysia: An Online Survey

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ABSTRACT

Objectives. To study and compare the pharmacy and medical students’ attitude towards pharmacist-physician collaboration and to determine the factors affecting their attitude.

Methods. A cross-sectional survey was conducted among undergraduate pharmacy and medical students throughout universities in Malaysia. Data were collected via self-administered web-based survey using Scale of Attitude towards Pharmacist-Physician Collaboration (SATP²C).

Results. Six hundred thirty-two students completed the SATP²C. Findings shown that both pharmacy and medical students had positive attitudes towards pharmacist-physician collaboration. However, pharmacy students showed a higher positive attitude (57.81 ± 6.11) compared to medical students (55.63 ± 6.71). There was a weak correlation between age and SATP²C score (r = 0.13). There was a statistically significant difference in SATP²C score between the gender, nationality, year of study and students’ previous participation in interprofessional activities.

Conclusion. Overall, both undergraduate pharmacy and medical students shown positive attitude towards pharmacist-physician collaboration. However, medical students expressed less positive attitude than pharmacy students which could influence IPC in the future when those students start working as health care professionals. Further studies on promoting collaboration and factors affecting their collaborative attitude is needed.

(182 words)
INTRODUCTION

Interprofessional collaboration (IPC) happens when health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care.\(^1\) Pharmacist-physician collaboration have shown to provide better patients’ outcomes\(^2\) reduce cost and time of patients’ treatment\(^3\), reduce medication-related errors while maximizing patients’ safety and quality care.\(^4\) In addition, IPC is important in patient-care system as physician can no longer solely able to provide all clinical and education services.\(^5\) Working along with pharmacists could reduce the burden on physicians, having the pharmacist as an extra safety check and to assists patients in their medication management.\(^6\) In early 1960s, there has been interest in team-based approaches in the fields of healthcare. Since then, interprofessional education (IPE) were introduced in universities in Canada, UK, US and Australia which were then followed by other developed and developing countries.\(^7\) According to Centre for the Advancement of Interprofessional Education (CAIPE), IPE refers to the occasion when 2 or more professions learn from and about each other to improve collaboration and the quality of care.\(^8\)

Most IPE programs are conducted at undergraduate level and it enables students to become competent in teamwork, integrate new skills and area of knowledge, improves interprofessional communication\(^8\) that are essential in preparing students to be ready for collaborative practice. The goal of IPE is for students to improve teamwork and understand roles among healthcare providers\(^1\) while setting aside negative stereotypes among healthcare professions.\(^8\) Previous study by Cox revealed that students who were trained in an IPE setting during their early study years were far more likely to be effective future collaborators.\(^4\) In Malaysia, IPE has been evolving since the past 10 years where it was implemented in few universities as either part of their curricular or co-curricular activities\(^10,11\) and has shown to produce positive influence on students’ attitudes and interprofessional teamwork.\(^12\) Hence, collaborative attitudes, as well as evaluation of them, must be encouraged on undergraduate level to improve the quality of health care services offered in the future.
Similar studies have been done in Kuwait by Katoue and colleagues whereas in US by Prado and Seselja-Perisin on the attitude of pharmacy and medical students on pharmacist-physician collaboration.\textsuperscript{13-15} Meanwhile, a study has been done in Malaysia by Zainuddin, but was limited to the final year undergraduate medical and pharmacy students in \textit{Universiti Teknologi Mara}.\textsuperscript{16} Therefore, this study aims to measure the attitude of undergraduate pharmacy and medical students from universities throughout Malaysia regarding pharmacist-physician collaboration and factors affecting their collaborative attitude. Through this finding, it will help in making changes or improvise the current curriculum of healthcare courses with focus on IPE for the future of healthcare system.
METHODS

A cross-sectional study was conducted from April 2019 to December 2019 through web-based survey which were distributed to all undergraduate students currently studying Bachelor of Pharmacy (Hons) and Bachelor of Medicine, Bachelor of Surgery (MBBS) or Doctor of Medicine (MD). The estimated number of pharmacy students was around 3,000 students whereas 7,000 students for medical students.

The survey was conducted using a validated Scale of Attitudes toward Pharmacist-Physician Collaboration (SATP²C) which was in English. The scale was originally developed and validated by Van Winkle and Hojat to be used for assessing the attitude of pharmacy and medical students on pharmacist-physician collaboration. The questionnaire comprised of 2 parts 1) demographic data; 2) SATP²C which includes 16 statements and was answered based on a 4-point Likert scale as follows; 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree. The possible range of scores were from 16 to 64, with a higher score indicating a more positive attitude towards IPC.

The data collected from the questionnaires were analyzed using Statistical Packaged for Social Sciences (SPSS) version 25.0. All descriptive data were expressed as frequency and percentage. The Shapiro-Wilk test was used to test on the normality of data distribution. One-way ANOVA and independent sample t-test were used to determine the differences of SATP²C score between groups and subgroups. Correlation between age and SATP²C score was determined using Pearson correlation. Results were expressed as mean and standard deviation. The significant level was set at p < 0.05.
RESULTS

The completed survey response rate was 6.32%. The 632 completed survey instruments comprised of 319 pharmacy students and 313 medical students. Participants’ age ranges between 18 to 28 years and were mostly female (80.1%). Of the responding students, majority stated that they were Malaysians (98.4%) whereas based on ethnicity, mostly were Malay (69.8%) followed by Chinese, Indian and few other races.

This study were administered by students from all year of study which included students from Year 1 to Year 5. The responses for different year were 25.2% (n = 159) from year 1, 20.6% (n = 130) from year 2, 19% (n = 120) from year 3, 25.8% (n = 163) from year 4 and 9.5% (n = 60) from year 5. It was reported that 60% of the respondents had families working within healthcare field. Three hundred and two students (52%) had undergone clinical attachments during their study. Based on their past IPE participations, 462 students stated that they had experiences working along with students from different professions whereas 363 students had done shared learning interactively with students from other study programme.

Table 1 illustrates the responses of pharmacy and medical students towards each item in SATP\textsuperscript{2}C. Mean total score for each item was ≥ 3; ranged between 2.98 to 3.75. Item 9 was negatively worded hence the score was reversed. Both pharmacy and medical students reported lower score for the Item 9 “The primary function of the pharmacist is to fill the physician’s prescription without question”. The highest scored item was for the Item 2 “Pharmacists are qualified to assess and respond to patients’ drug treatment needs” by pharmacy students. Generally, the students mean scores were above 3 which concludes the positive attitude towards IPC.
As shown in Table 2, the mean total attitude score for pharmacy students and medical students were 57.81 ± 6.11 and 55.63 ± 6.71 respectively with a maximum score of 64. There was a statistically significant difference in the total SATP²C scores between pharmacy and medical students (p < 0.001). Within the SATP²C instrument, there are 3 specific factors which were “responsibility and accountability”, “shared authority” and “interdisciplinary education”. Pharmacy students consistently showed a more positive attitude for Factor 1, 2 and 3 (32.54 ± 3.61 vs. 31.03 ± 4.04, 17.85 ± 2.19 vs. 17.46 ± 2.29, 11.17 ± 1.34 vs. 10.83 ± 1.53) when compared to the medical students (p< 0.05).

There was a weak positive correlation between age and SATP²C score (r = 0.13, p< 0.001). Comparison of mean SATP²C score based on students’ demographic data and past IPE participations are shown in Table 3. Female students revealed a more positive attitude compare to male students (57.00 ± 6.50 vs. 55.64 ± 7.77; p = 0.036). Regarding mean score based on nationality, Malaysian reported more positive attitude towards IPC compared to students who came from other countries (p< 0.001). There was a significance difference observed between 1st year with 4th year students (p < 0.001) and 4th year with 5th year students (p = 0.018). Students that had participated in activities involving students from different profession background (57.06 ± 6.30; p = 0.033) or had done shared learning with students from another programme (55.81 ± 6.97; p = 0.019) revealed a more positive attitude towards IPC. In contrast, ethnicity, family members working in healthcare field and experiences in clinical settings had no influence on students’ attitude towards pharmacist-physician collaboration.
**DISCUSSION**

Through this study, it provides a clear view of the attitudes of medical and pharmacy students towards pharmacist-physician collaboration in Malaysia. This will help the higher education provider (HEP) in initiating strategies to improve the students’ attitude on interprofessional collaboration and education. In the future, good relationship among healthcare professional can be manifested and significantly able to contributes in the country’s overall healthcare services.

Our findings showed that pharmacy and medical students expressed overall positive attitude towards collaborative practice between pharmacist and physician. However, pharmacy students’ attitude were more positive than medical students based on total mean SATP^2C score which were corresponding to previous studies done by Prado and colleagues and by Seselja-Perisin and colleagues. In Malaysia, the integration of pharmacists within the medical team was started only in about last 10 years and now the pharmacists role has gone beyond dispensing medication. The lower attitude among medical students may due to lack of understanding on the role of pharmacist.

There was a statistically significant difference in attitude towards “responsibility and accountability”, “shared authority” and “interdisciplinary education”. Collaborative practice is most effective when it happens in a system that facilitates communication and is composed with respect, trust, professional responsibility and accountability. It can be supported by a study by Roslan and colleagues on the perceptions of physician in Malaysia on IPC where teamwork is essential to provide the best health of patients hence collaborative-practice ready graduates should be manifested.
IPE has statistically proved to be important in assisting future pharmacist and physician to have better collaborative practice.\textsuperscript{22} This study has shown that students’ attitude towards IPC were dependent on their active participation in activities related to IPE. More positive attitude were observed among students that have worked along or had exposed to interprofessional curriculum compared to students’ that have not. A recent finding done in Malaysia reported participation in community service with different healthcare students resulted in better interprofessional relationship and confidence to work with other professions.\textsuperscript{10}

Other factors that may affect students’ attitude towards IPC includes gender, nationality and year of study. Female demonstrated a more positive attitude compared to male which were similar to a study in Brazil.\textsuperscript{14} However, another study done in among pharmacy students by Wang and colleagues in China reported that male had more positive attitude towards IPC\textsuperscript{23} and this may due to the fact that man in their country are more open-mindedness. This matter may be multifactorial hence more studies should inspect regarding relation between gender and attitude towards IPC. Malaysian students reported to have more positive attitude compared to non-Malaysian. In spite of being a developing country, it was in contrast with a study done by Shankar and colleagues which stated that developing nations usually have lower attitude compare to developed ones.\textsuperscript{24}

Fourth-year students had a higher score than students from first year. In Brazil, it has shown that first-year medical students had higher score than last-year medical students which may due to the fact that students had been influenced by the physicians in clinical settings that were lacking of collaborative attitude.\textsuperscript{14} As this study was done during the beginning of the academic year, first-year students may had lower score because of lack of exposure and understanding regarding other professions’ role.

This study had some limitation. There was inequality of distribution of responses between year of study especially among the 5\textsuperscript{th} year medical students with the lowest response rate (n = 60, 9.5\%) possibly due to their time constraints as clinical students. Besides, the survey was distributed only through web-based method hence accessibility of internet and individuals’ average time spent on
mobile may causes the low response rate. The one-time point nature of this study may have not reflected the students’ attitude over time hence continuous studies on their attitude towards IPC and factors affecting them should be done by future researchers.

CONCLUSION

Overall, pharmacy and medical students in Malaysia reported positive attitude towards pharmacist-physician collaboration which were measured using the validated SATP²C. However, pharmacy students presented more collaborative attitudes than medical students. It has shown that IPE had affected the students’ attitude towards collaborative practice. Therefore, continuous efforts in incorporating IPE in curriculum should be done during undergraduate levels to encourage students to become competent healthcare provider with better collaborative attitude.

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We would like to thank all respondents that participated in this study.

(1,988 words)
REFERENCES


8. Barr H. Interprofessional Education- Today, Yesterday and Tomorrow


Table 1. Item Scores of SATP²C Administered by Pharmacy and Medical Students in Malaysia

<table>
<thead>
<tr>
<th>Items</th>
<th>Pharmacy</th>
<th>Medical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M(SD)</td>
<td>M(SD)</td>
</tr>
<tr>
<td>1. A physician should be viewed as a collaborator and colleague with a pharmacist rather than his/her superior.</td>
<td>3.67 (0.54)</td>
<td>3.55 (0.59)</td>
<td>3.61 (0.57)</td>
</tr>
<tr>
<td>2. Pharmacists are qualified to assess and respond to patients’ drug treatment needs.</td>
<td>3.76 (0.49)</td>
<td>3.42 (0.66)</td>
<td>3.59 (0.61)</td>
</tr>
<tr>
<td>3. During their education, pharmacy and medical students should be involved in teamwork in order to</td>
<td>3.74 (0.51)</td>
<td>3.60 (0.62)</td>
<td>3.67 (0.57)</td>
</tr>
</tbody>
</table>
understand their respective roles.

4. Pharmacists can contribute to decisions regarding drug interactions that can affect the patients. (3.75) (3.60) (3.67)
   (0.52) (0.59) (0.56)

5. Pharmacists should be accountable to patients for the drug therapy they provide. (3.64) (3.44) (3.54)
   (0.56) (0.71) (0.65)

6. There are many overlapping areas of responsibility between pharmacists and physicians in drug treatment of the patients. (3.33) (3.31) (3.32)
   (0.65) (0.70) (0.67)

7. Pharmacists have special expertise in counselling patients on drug treatment. (3.72) (3.36) (3.54)
   (0.51) (0.67) (0.62)

8. Both pharmacists and physicians should contribute to decisions regarding the type and dosage of medicine given to the patients. (3.62) (3.59) (3.61)
   (0.55) (0.61) (0.58)

9. The primary function of the pharmacist is to fill the physician’s prescription without question. (3.02) (2.98) (3.00)
   (0.96) (0.86) (0.91)

10. Pharmacists should be involved in making drug policy decisions concerning the hospital/pharmacy services upon which their work depends. (3.43) (3.24) (3.34)
    (0.58) (0.65) (0.63)

11. Pharmacists as well as physicians should have responsibility for monitoring the effects of drugs on the patients. (3.62) (3.52) (3.57)
    (0.58) (0.65) (0.61)

12. Pharmacists should clarify a physician’s order when they feel that it might have detrimental effects on the patient. (3.75) (3.66) (3.70)
    (0.52) (0.59) (0.56)

13. Physicians and pharmacists should be educated to establish collaborative relationships. (3.75) (3.69) (3.72)
    (0.51) (0.55) (0.53)

14. Physicians should consult pharmacists for help with (3.63) (3.56) (3.59)
patients having an adverse reaction or refractory to drug therapy.

15. Physicians should be made aware that pharmacists can help in providing the right drug treatment.

16. Interprofessional relationships between physicians and pharmacists should be included in their professional education programs.

Table 2. Comparison of the Total and Factor Score of SATP²C between Pharmacy and Medical Students

<table>
<thead>
<tr>
<th>SATP²C Score</th>
<th>Pharmacy</th>
<th>Medical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Overall</td>
<td>57.81 (6.11)</td>
<td>55.63 (6.71)</td>
<td>56.73 (6.50)</td>
</tr>
<tr>
<td>Factor 1</td>
<td>32.54 (3.61)</td>
<td>31.03 (4.04)</td>
<td>31.79 (3.90)</td>
</tr>
<tr>
<td>Factor 2</td>
<td>17.85 (2.19)</td>
<td>17.46 (2.29)</td>
<td>17.65 (2.25)</td>
</tr>
<tr>
<td>Factor 3</td>
<td>11.17 (1.34)</td>
<td>10.83 (1.53)</td>
<td>11.00 (1.45)</td>
</tr>
</tbody>
</table>

*Independent t-test

b ‘Responsibility and accountability’ consists of questions 1, 2, 4, 5, 6, 7, 8, 10, 11 (possible score range: 9-36)

c ‘Shared authority’ consists of questions 9, 12, 13, 14, 15 (possible score range: 5-20)

d ‘Interdisciplinary education’ consists of questions 3, 13, 16 (possible score range: 3-12)

* p< 0.05

Table 3. Comparison of Mean SATP²C Score among Groups

<table>
<thead>
<tr>
<th>SATP²C Score</th>
<th>Pharmacy</th>
<th>Medical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Overall</td>
<td>57.81 (6.11)</td>
<td>55.63 (6.71)</td>
<td>56.73 (6.50)</td>
</tr>
<tr>
<td>Factor 1</td>
<td>32.54 (3.61)</td>
<td>31.03 (4.04)</td>
<td>31.79 (3.90)</td>
</tr>
<tr>
<td>Factor 2</td>
<td>17.85 (2.19)</td>
<td>17.46 (2.29)</td>
<td>17.65 (2.25)</td>
</tr>
<tr>
<td>Factor 3</td>
<td>11.17 (1.34)</td>
<td>10.83 (1.53)</td>
<td>11.00 (1.45)</td>
</tr>
</tbody>
</table>

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b ‘Responsibility and accountability’ consists of questions 1, 2, 4, 5, 6, 7, 8, 10, 11 (possible score range: 9-36)

c ‘Shared authority’ consists of questions 9, 12, 13, 14, 15 (possible score range: 5-20)

d ‘Interdisciplinary education’ consists of questions 3, 13, 16 (possible score range: 3-12)

* p< 0.05
<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>M (SD)</th>
<th>p value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>55.64 (7.77)</td>
<td>0.036 a</td>
</tr>
<tr>
<td>Female</td>
<td>57.00 (6.50)</td>
<td></td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaysian</td>
<td>56.85 (2.95)</td>
<td>&lt;0.001 a</td>
</tr>
<tr>
<td>Others</td>
<td>49.50 (13.07)</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>56.74 (6.36)</td>
<td>0.807 b</td>
</tr>
<tr>
<td>Chinese</td>
<td>56.86 (6.19)</td>
<td></td>
</tr>
<tr>
<td>Indian</td>
<td>57.02 (7.51)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>55.61 (8.23)</td>
<td></td>
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<tr>
<td>Study programme</td>
<td></td>
<td></td>
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<tr>
<td>Pharmacy</td>
<td>57.81 (6.11)</td>
<td>&lt;0.001 a</td>
</tr>
<tr>
<td>Medical</td>
<td>55.63 (6.71)</td>
<td></td>
</tr>
<tr>
<td>Year of study</td>
<td></td>
<td></td>
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<tr>
<td>Year 1</td>
<td>55.23 (7.47)</td>
<td>&lt;0.001 b</td>
</tr>
<tr>
<td>Year 2</td>
<td>56.88 (6.07)</td>
<td></td>
</tr>
<tr>
<td>Year 3</td>
<td>57.27 (5.37)</td>
<td></td>
</tr>
<tr>
<td>Year 4</td>
<td>58.25 (7.89)</td>
<td></td>
</tr>
<tr>
<td>Year 5</td>
<td>56.73 (6.50)</td>
<td></td>
</tr>
<tr>
<td>Family members within healthcare field</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>56.88 (6.42)</td>
<td>0.452 a</td>
</tr>
<tr>
<td>No</td>
<td>56.48 (6.63)</td>
<td></td>
</tr>
<tr>
<td>Experience working in clinical settings</td>
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<td></td>
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<tr>
<td>Yes</td>
<td>57.08 (6.51)</td>
<td>0.198 a</td>
</tr>
<tr>
<td>No</td>
<td>56.41 (6.49)</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Prior activities with different programme</td>
<td>57.06 (6.30)</td>
<td>55.81 (6.97)</td>
</tr>
<tr>
<td>Shared learning with different courses</td>
<td>57.25 (6.19)</td>
<td>56.03 (6.85)</td>
</tr>
</tbody>
</table>

*a Independent t-test

*b One-way ANOVA test

* Significance set at \( p < 0.05 \)