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Comparisons of American, Taiwan, and Thai Pharmacy Students' Perceptions of Factors Affecting Their Academic Performance

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ABSTRACT: This study examined pharmacy students' perceptions of factors affecting their academic performance among the United States, Taiwan, and Thailand. The study also compared two groups of factors that American, Taiwan, and Thai pharmacy students perceived as the causes of their academic success and failure in the pharmacy programs. This study used a convenience sample of all third-, fourth-, and fifth-year pharmacy students in classes. The same questionnaire was used to collect the data, and a total of 378 American, 191 Taiwan, and 178 Thai pharmacy students participated in the study. The questionnaire was first written in English, then it was translated into Chinese and Thai by the translators who were bilingual in Chinese-English and Thai-English. It was found that being diligent, having a good instructor, and a strong determination were named as the number one factor(s) for their academic success, while lack of responsibility and poor time management were named as the number one factor(s) for their academic failure. At school, the American students paid most of their attention in making good grades, whereas Taiwan students placed more emphasis on being able to graduate as soon as possible, and Thai students preferred to have more fun with their social life at school. Overall, pharmacy students' perceptions of factors affecting their academic success and failure were found to be significantly different across cultures and countries.

Key words: pharmacy students; perceptions; academic performance; success; failure; American; Taiwan; Thailand.

INTRODUCTION

Causes of pharmacy students' academic success and failure in the pharmacy programs have long been studied by pharmacy educators. In most of the studies, researchers attempted to find the relationships between several predictors and pharmacy students' academic performance. As a result of these studies, a number of predictors have been identified and used to assist the admission committee in selecting potentially successful pharmacy students into the pharmacy programs. For the American pharmacy students, many

studies have shown that prepharmacy grade point average (GPA), prepharmacy math/science GPA, demographics, PCAT scores, involvement in extracurricular activities, prior four-year college degree, Myers-Briggs type indicator, motivation, interest, perseverance, and social support have been found to affect their academic success and failure in the pharmacy schools (1-18). Seven studies have indicated that prepharmacy GPA had the highest correlation with American pharmacy students' academic performance (1-5,16,18). In six of these studies, prepharmacy GPA

alone accounted for 21-33% of variance in American pharmacy students' academic performance (1-4,16,18). In another study at the American pharmacy school (17), prepharmacy math/science GPA and prior four-year college degree were identified as the two significant predictors of first year pharmacy students. Both predictors accounted for 28-34% of variance of the first year pharmacy students' academic performance (17). Other than these predictors, certain specific portions of the PCAT also were found to be related to pharmacy students' success and failure in pharmacy schools (1-12). However, the predictability of the PCAT varied among students from different pharmacy schools and ethnic groups. When comparing the predictive power of prepharmacy GPA and PCAT scores, some studies found that prepharmacy GPA was a better predictor of pharmacy students' academic performance than the PCAT (1-5), while other studies reported the opposite results (6-10).

In other related studies, results from one study of demographic variables showed that no significant relationships existed between either age or gender and American pharmacy students' academic performance (1). However, in another study, age was found to be one of the predictors of American pharmacy students' academic performance (10). Two previous studies have indicated that ethnicity significantly influenced the predictors of pharmacy students' academic performance (4,12). As related to pharmacy students' involvement in extracurricular activities, De Young and Sorofman concluded that American pharmacy students' academic performance was not influenced significantly by working and grade point averages reported by working and nonworking American pharmacy students in the same study (13). In another study, the number of hours contributed to community activities was identified as the best predictor of older and Black students' academic performance (16). For Thai pharmacy students, prepharmacy GPA, age, and involvement in community activities were identified as predictors of their academic success and failure in the pharmacy programs (18). Prepharmacy GPA alone accounted for 50% of variance in Thai pharmacy students' academic performance (18). So far, predictors of academic performance for Taiwan pharmacy students have not been studied and reported in the pharmacy literature.

Although many predictors of pharmacy students' academic success and failure in the pharmacy programs

have been identified, pharmacy students' perceptions of their academic success and failure have not yet been examined across cultures and countries. Therefore, it is interesting to see that what factors, other than the identified predictors in the literature, can be used to account for pharmacy students' academic success and failure in the pharmacy programs? Can the same factor(s) or predictor(s) be used universally to predict pharmacy students' academic success and failure across cultures and countries? Are there any differences among pharmacy students' perceptions of factors affecting their academic performance across cultures? Finally, if there are differences among them, how do they perceive these differences?

STUDY OBJECTIVES

The objectives of this study were:

1. To identify the top three factors that American, Taiwan, and Thai pharmacy students perceive as the causes of their academic success in the pharmacy programs.
2. To identify the top three factors that American, Taiwan, and Thai pharmacy students perceive as the causes of their academic failure in the pharmacy programs.
3. To examine American, Taiwan, and Thai pharmacy students' opinions on factors affecting their academic performance.
4. To examine American, Taiwan, and Thai pharmacy students' rankings of factors affecting their academic performance.
5. To compare American, Taiwan, and Thai pharmacy students' responses.

STUDY HYPOTHESES

Based on the study objectives, four hypotheses were tested in this study as follows:

- H1. There is a difference in the number one factor that American, Taiwan, and Thai pharmacy students perceive as the cause of their academic success in the pharmacy programs.
- H2. There is a difference in the number one factor that American, Taiwan, and Thai pharmacy students perceive as the cause of their academic failure in the pharmacy programs.

- H3. There are differences in American, Taiwan, and Thai pharmacy students' opinions on factors affecting their academic performance.
- H4. There are differences in American, Taiwan, and Thai pharmacy students' rankings of factors affecting their academic performance.

MATERIALS AND METHODS

Subjects were 378 pharmacy students attending three pharmacy schools in the United States, 191 pharmacy students attending three pharmacy schools in Taiwan, and 178 pharmacy students attending one pharmacy school in Thailand. The questionnaire was first written in English, then it was translated into Chinese and Thai by the translators who were bilingual in Chinese-English and Thai-English. Questionnaires were distributed to all third-, fourth-, and fifth-year pharmacy students in classes. Students were asked to complete the questionnaires during their class hours and return them to the study coordinators. This study used a convenience sample. Students who did not show up on the class days selected were not included in the sample. For each course in which the questionnaire was distributed, more than 90 percent of the students attending the course that day completed the questionnaire.

The survey was constructed to examine pharmacy students' perceptions of several factors that affecting their academic performance. First, two open-ended questions were used to identify the top three factors that pharmacy students perceived as the causes of their academic success and failure in the pharmacy programs. Second, they were asked to indicate their opinions on each of the nine operational statements using a continuous five-point scale with 1 being a lot worse to 5 being a lot better. Third, they were asked to rank the importance of six factors using the numbers

from 1 to 6 with 1 being the most importance and 6 being the least importance for them.

All returned questionnaires were coded, keypunched, and analyzed in the United States. A data file was created and saved on a floppy diskette. Data analyses were performed using PC-SAS (Personal Computer Statistical Analysis Software) and an alpha level of 0.01 was chosen as a significant level for the study (19). Frequency counts, means, and standard deviations were computed for all continuous variables. Analyses of variance (ANOVA) were used to compare pharmacy students' opinions and rankings of factors affecting their academic performance among the three countries, U.S., Taiwan, and Thailand respectively.

RESULTS

The Top Three Factors that Pharmacy Students' Perceive as the Causes of their Academic Success and Failure in Pharmacy School

In this section, pharmacy students were asked about their perceptions of factors that led to either success or failure in the pharmacy schools. Table 1 compares the top three factors that American, Taiwan, and Thai pharmacy students perceived as the causes of their academic success in the pharmacy schools, whereas Table 2 compares the top three factors that American, Taiwan, and Thai pharmacy students perceived as the causes of their academic failure in the pharmacy schools. It was found that being diligent, having a good instructor, and having a strong determination were named as the number one factor(s) for their academic success by American, Taiwan, and Thai pharmacy students respectively (Table 1). On the other hand, lack of responsibility and poor time management were named as the number one factor(s) for their academic failure by American, Thai, and Taiwan pharmacy students (Table 2).

Table 1. The Top Three Factors that Pharmacy Students Perceived as the Causes of their Academic Success by Country.

Rank Factor	U.S.	
	Frequency	Percent
1. Being diligent	115	32.5
2. Having a supportive personnel	106	29.9
3. Having a good instructor	102	28.8
Rank Factor	Taiwan	
	Frequency	Percent
1. Having a good instructor	112	60.9
2. Being diligent	100	54.4
3. Having a strong determination	45	24.6
Rank Factor	Thailand	
	Frequency	Percent
1. Having a strong determination	78	45.6
2. Being diligent	74	43.3
3. Being responsible	71	41.5

Table 2. The Top Three Factors that Pharmacy Students Perceived as the Causes of their Academic Failure by Country.

Rank Factor	U.S.	
	Frequency	Percent
1. Lack of responsibility	104	30.3
2. Having a bad instructor	87	25.4
3. Poor time management	86	25.1
Rank Factor	Taiwan	
	Frequency	Percent
1. Poor time management	99	55.0
2. Not working hard	71	39.4
3. Lack of a supportive personnel	58	32.2
Rank Factor	Thailand	
	Frequency	Percent
1. Lack of responsibility	80	47.9
2. Not working hard	59	35.3
3. Lack of a strong determination	33	19.8

Other responses given by pharmacy students for the causes of their academic success and failure were classified into the following five categories (behavior choices, learning techniques, motivational factors, instructional factors, and personal situations). For behavior choices, pharmacy students were quick to place a substantial portion of the responsibility for success or failure squarely on their own shoulders. Typical comments were: "I do not study enough, I procrastinate too much, I have a lack of dedication or of discipline, I have the wrong priorities, I engage in too much social life, practical experience working in a pharmacy would help me, I underestimate the demands for a particular course, it is important to attend classes regularly, and occasionally a student will admit that I just cannot handle the coursework". For learning techniques, pharmacy students offered many tips for improving academic performance. Many of these were learning techniques that a student who was floundering should apply to improve academic performance. They included: "Utilization of good time management practices, improving note-taking and test-taking skills, networking with other students to aid each other in learning, not being too inhibited to ask questions and interact with professors inside and outside the classroom, using proven relaxation techniques to reduce tension, improving your planning and organization, obtaining legitimate access to old exams". It should be noted here that any students can obtain the necessary information about these techniques, but the real trick is to apply them and continue to practice them with required self-discipline.

Among the motivational factors identified by pharmacy students were: "Maintain a positive attitude, continue to persevere even when things are going bad, set goals and strive to accomplish them, make a total commitment to the academic program, get involved in student activities to maintain a positive attitude and not become isolated, keep a high level of confidence and self-esteem, and decide if pharmacy is what you really want and if not opt out early". As related to the instructional factors, pharmacy students in the study identified a large number of instructional factors that they perceived would have an impact on their success or failure in the pharmacy program. A common complaint was that curriculum presented an overload of coursework. Another very frequent complaint was indifference or uncaring attitude exhibited by faculty. Criticism also was frequently directed at exams. These complaints varied from "We do not know what is expected"

to "exams are scheduled poorly" to "exams are unfair, ambiguous, and test irrelevant material rather than important concepts". Also, there was a number of criticisms concerning a requirement of too much memorization rather than application and problem-solving. The students were also concerned about professors being inaccessible, too research oriented, and not being able to communicate well because of their dialects. Other concerns addressing the availability of qualified prepharmacy advisors, good pharmacy counselors, tutoring services, and access to old exams and to computer assisted instruction. Other items mentioned included poor coordination and sequencing of courses in the curriculum and poor classroom facilities. There also were concerns about too large of classes.

Pharmacy students frequently listed financial burdens and the need to work as a major impact on their academic performance for personal situations. The importance of support from family and friends often was cited by the students. Having outside interests to reduce tension was noted to be a real benefit. Problems at home was mentioned as a factor that could be very disruptive. The importance of good health also was mentioned several times. Having realistic expectations of oneself was another factor mentioned. Finally, several students mentioned the importance of enjoying what you were doing and thereby having a positive attitude.

Pharmacy Students' Opinions on Factors Affecting their Academic Performance

Pharmacy students were asked to indicate their opinions on nine operational statements using a continuous five-point scale ranging from 1 to 5 with 1 being a lot worse and 5 being a lot better. Table 3 lists all the means and standard deviations of American, Taiwan, and Thai pharmacy students' ratings of the following nine statements: 1) working during the school academic year makes my GPA...; 2) having previous pharmacy related work experience makes my GPA...; 3) not being involved in any student organization activities makes my GPA...; 4) not working at all during school academic year makes my GPA...; 5) participation in student organization activities makes my GPA...; 6) having a tutor to help me makes my GPA...; 7) working less would make my GPA...; 8) not having any pharmacy related work experience makes my GPA...; and 9) increasing the number of hours studying makes

my GPA.... Overall, there were significant differences between American and Taiwan pharmacy students' opinions of all statements except the eighth statement. Also, there were significant differences between Taiwan and Thai pharmacy students' opinions on the following statements

(second, third, fifth, sixth, seventh, and eighth). Finally, American and Thai pharmacy students' opinions were significantly different for the three statements (fourth, seventh, and eighth).

Table 3. Pharmacy Students' Opinions by Country.

Statement*	Country			Significance
	U.S.	Taiwan	Thailand	
Working during the school academic year makes my GPA	2.53±0.89 ^a	2.76±0.90 ^b	2.63±0.59	F=4.91; p=0.0076
Having previous pharmacy related work experience makes my GPA	3.76±0.67 ^a	3.92±0.87 ^b	3.64±0.58 ^a	F=7.05; p=0.0009
Not being involved in any student organization activities makes my GPA	3.15±0.76 ^a	2.63±0.94 ^b	3.09±0.52 ^a	F=30.35; p=0.0001
Not working at all during school academic year makes my GPA	3.58±0.95 ^a	3.24±0.86 ^b	3.27±0.61 ^b	F=13.53; p=0.0001
Participation in student organization activities makes my GPA	3.05±0.68 ^a	3.21±0.82 ^b	2.96±0.52 ^a	F=6.41; p=0.0017
Having a tutor to help me makes my GPA	3.76±0.73 ^a	4.06±0.75 ^b	3.89±0.63 ^a	F=11.28; p=0.0001
Working less would make my GPA	3.74±0.76 ^a	2.81±0.91 ^b	3.42±0.58 ^c	F=90.51; p=0.0001
Not having any pharmacy related work experience makes my GPA	2.48±0.68 ^a	2.40±0.74 ^a	2.88±0.43 ^b	F=29.84; p=0.0001
Increasing the number of hours studying makes my GPA	4.29±0.76 ^a	4.06±0.85 ^b	4.18±0.65	F=5.38; p=0.0048

* Pharmacy students were asked to indicate their opinions using a continuous five-point scale from 1 to 5 with 1 being a lot worse and 5 being a lot better.

^{abc} indicate the differences between or among groups by post-hoc comparisons.

Pharmacy Students' Rankings of Factors Affecting their Academic Performance

Next, pharmacy students were asked to rank the importance of six factors that they believed were important to them using the numbers from 1 to 6 with 1 being the most important and 6 being the least important. The six items were listed as follows: 1) making good grades; 2) earning more money from employment; 3) being able to graduate as soon as possible; 4) having more fun with my social life; 5) making more contribution to the community; and 6) getting more involvement with student organization.

The means and standard deviations of these rankings by American, Taiwan, and Thai pharmacy students are listed in Table 4. According to Table 4, there were significant differences between American and Thai pharmacy students' rankings of five items (all items except the fifth item). Also, there were significant differences between Taiwan and Thai pharmacy students' rankings of all items except the fifth item. Finally, American and Taiwan pharmacy students' rankings were significantly different for the four items (first, second, third, and fourth).

Table 4. Pharmacy Students' Rankings by Country.

Item*	Country			Significance
	U.S.	Taiwan	Thailand	
Making good grades	1.77±1.28 ^a	2.72±1.37 ^b	3.48±1.45 ^c	F=102.76; p=0.0001
Earning more money from employment	3.53±1.47 ^a	2.96±1.54 ^b	4.84±1.59 ^c	F=74.53; p=0.0001
Being able to graduate as soon as possible	2.78±1.61 ^a	1.67±1.11 ^b	3.28±1.66 ^c	F=56.49; p=0.0001
Having more fun with my social life	4.06±1.47 ^a	3.08±1.39 ^b	2.17±1.51 ^c	F=104.62; p=0.0001
Making more contribution to the community	3.86±1.51	3.77±1.51	3.45±1.38	F=4.46; p=0.0119
Getting more involvement with student organization	4.08±1.50 ^a	3.87±1.47 ^a	3.21±1.46 ^b	F=20.59; p=0.0001

* Pharmacy students were asked to rank the importance of the six items using the numbers from 1 to 6 with 1 being the most importance to 6 being the least importance.

^{abc} indicate the differences between or among groups by post-hoc comparisons.

Comparisons of American, Taiwan, and Thai Pharmacy Students' Responses

In terms of pharmacy students' opinions on the nine operational statements (Table 3), the highest rating for each of the nine statements was compared across the three countries. It was found that Taiwan pharmacy students perceived that having a tutor to help them, having previous pharmacy related work experience, and participation in student organization activities would make their GPAs

better than American and Thai pharmacy students. Taiwan pharmacy students also perceived that not being involved in any student organization activities would make their GPAs worse than American and Thai pharmacy students. For the American pharmacy students, they perceived that not working at all during school academic year would make their GPAs better than Taiwan and Thai pharmacy students. American pharmacy students also perceived that increasing the number of hours studying would make their GPAs better than Taiwan pharmacy students.

In comparison among pharmacy students' rankings of the six items across the three countries (Table 4), the American pharmacy students gave the most important rank to making good grades. On the other hand, Taiwan pharmacy students gave the most important rank to being able to graduate as soon as possible, whereas Thai pharmacy students gave the most important rank to having more fun with my social life. Overall, there were differences among the three groups of pharmacy students for the first four items (making good grades, earning more money from employment, being able to graduate as soon as possible, and having more fun with my social life). Thai pharmacy students ranked the fifth item (making more contribution to the community) more important than American pharmacy students ($p < 0.05$), and they also ranked the sixth item (getting more involvement with student organization) more important than American and Taiwan pharmacy students ($p < 0.01$).

LIMITATIONS

First, this study used a convenience sample of pharmacy students. Second, the results of this study were limited to self-reported data by pharmacy students. Third, generalization of the results is limited to pharmacy students from seven pharmacy schools in the three countries. Therefore, cautious interpretation is advised.

DISCUSSION AND CONCLUSIONS

The four hypotheses were accepted because there were differences in the number one factor(s) that American, Taiwan, and Thai pharmacy students perceived as the causes of their academic success (H1) and failure (H2) in the pharmacy programs. In addition, there were significant differences in American, Taiwan, and Thai pharmacy students' opinions (H3) and rankings (H4) of factors affecting their academic performance. In conclusion, the results of this study indicated that pharmacy students' perceptions of the causes of their academic success and failure were significantly different across cultures and countries. At school, the American pharmacy students paid most of their attention in making good grades. However, they perceived that too much work during the school year would lower their GPAs. To improve their GPAs, they perceived that they should increase the number of hours of study. On the other hand, Taiwan pharmacy students placed more emphasis on

being able to graduate as soon as possible as their top priority. At the same time, they were more likely to perceive that having a tutor to help them and previous pharmacy related work experience would improve their GPAs at school. Finally, although Thai pharmacy students preferred to have more fun with their social life at school, but they perceived that too much involvement in student organizational activities would lower their GPAs.

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