Pharmacy Education, 2014; 14 (1) 57 - 63

The Effects of Leadership Involvement and Part-time Employment on Pharmacy Student Academic Performance

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Abstract

Objective: The primary objective of this study was to examine the relationship between extracurricular involvement and academic performance during pharmacy school.

Methods: All pharmacy students at the University at Buffalo School of Pharmacy and Pharmaceutical Sciences were invited to complete a 14-item online survey. The survey questions focused on their employment status outside of school and their involvement in professional organisations. Responses were linked to their grade point average (GPA) using their university identification number. Three time-series unadjusted and adjusted, multivariable regressions were performed to examine the relationship between grade point average and part-time employment (PTE), GPA and participation in professional organisation, and GPA and combined activities.

Results: This study included survey results from 119 students (response rate of 24.3%). Students working 5-14 hours per week towards part-time employment did not exhibit a significant difference in GPA compared to those working 0-4 hours; however students working 15-19 hours had lower GPA ($p<.05$). A negative correlation was found between professional involvement and GPA ($p<.05$). The combined effect of part-time employment and professional involvement exhibits a negative effect in the bivariate model ($p<.05$).

Conclusions: A moderate amount of PTE is considered beneficial to complement academic achievement when compared to no employment. Excessive time in professional involvement is associated with a negative effect on academic success.

Keywords: *pharmacy student; student leadership; extracurricular involvement; work experience; academic performance*

Introduction

Pharmacy education has changed dramatically during the last decade with the emergence of the Doctor of Pharmacy (PharmD) as the entry degree for pharmacists. The greater emphasis on pharmaceutical care triggered the heavy course load on clinical skills. In response to prepare pharmacy students for tomorrow's pharmacy needs, the Accreditation Council of Pharmacy Education (ACPE) implemented guidelines that require pharmacy students to complete at least 300 experiential hours over the first three professional pharmacy years.

Traditionally, pharmacy schools have focused on pre-admission criteria for academic success to identify students that are more likely to graduate and become a competent pharmacist. A previously earned bachelor degree, (Chisholm *et al*., 1997; Chisholm, 2001; Renzi *et al*., 2007; McCall *et al*., 2007), Pharmacy College Admission Test (PCAT) scores, (Kidd & Latif, 2003; Meagher *et al*., 2006; Meagher *et al*., 2011; Schauner *et al*., 2013) and pre-pharmacy grade point average (GPA) (Kidd & Latif, 2003; Meagher *et al*., 2006; Schauner *et al*., 2013) were positively correlated with academic performance during pharmacy school. Interestingly, both PCAT and prepharmacy GPA have been correlated with passing the NAPLEX, but attainment of a bachelor's degree was not correlated with NAPLEX scores (Kuncel *et al*., 2005; McCall *et al*., 2007). However, with the new ACPE's requirement to assess curricular outcomes and effectiveness, studies are needed to examine factors contributing to success during pharmacy education. Mar and colleagues found previous pharmacy work experience did not have significant effects on academic or clinical performance during school (Mar *et al*., 2010)

As a result of the changes in pharmacy education, pharmacy schools began to increase tuition to account for the increased graduate coursework required. Unlike other graduate degree programs, pharmacy students often begin their occupational career concurrently with their educational career. A majority of pharmacy students become interns or technicians at community retail settings

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ISSN 1447-2701 online

or hospitals while enrolled in school or even before entering pharmacy schools (Siracuse *et al*., 2008) Consequently, in this new era of pharmacy education, students have to balance between didactic coursework, experiential education, and part-time employment (PTE).

High school students engaging in PTE demonstrated poor academic performance as compared to those that did not work (Bachman *et al*., 2013). However, with the change in economy and more mature students returning to school, many returning students rely on PTE to pay for living expenses and family obligations. Theoretically, we expect mature students to be more committed to their studies and integrating school and work will better prepare them for the workforce upon graduation. Two studies found PTE during pharmacy school did not have an effect on pharmacy GPA (Birdwell & Escovitz, 1990; Briceland *et al*., 1990). However, both these studies were conducted in 1990 prior to the curricular mandate of 300 experiential hours. In addition, as the economy declines, pharmacy students are told to be more involved in professional organisations to network for future employment. The combination of ACPE expectations and accountability has made it imperative that educators pay attention to the potential impact of PTE and extracurricular activities on pharmacy student outcomes. Currently, there is a lack of published pharmacy literature examining the relationship between extracurricular activities and academic success in pharmacy school.

The primary objective of this study was to examine the relationship between extracurricular involvement and academic performance during pharmacy school. It was intended to provide a framework for pharmacy educators to advise students how to optimise their pharmacy education after admission to the program.

Methods

Study Design and Sample

All data were generated from a recent all-school survey focusing on students' extracurricular participation. The survey invited all pharmacy students enrolled at the University at Buffalo School of Pharmacy and Pharmaceutical Sciences (UB SoPPS) to complete a 14-item online questionnaire during the fall semester of 2012. Survey questions were developed by the authors and piloted to a group of 20 students (five from each academic class) to clarify any misinterpretations of survey questions. The survey focused on student employment status outside of school and their participation in professional organisation on campus. Vovici online survey software (Vovici Corporation, Herdon, VA) was used to construct the survey instrument and to collect survey responses. The survey also included a consent form in the beginning of the survey. Survey responses were linked to GPA, PCAT, and pre-admission GPA from the records obtained from the admissions office. Students were assured this information would be de-identified with no effect on their GPA. The university's institutional review board approved this study.

Eligibility criteria allowing for 490 eligible participants included full-time pharmacy students enrolled between 2008-2012. The study invited students from dual degree programs (MBA/PharmD, JD/PharmD, MPH/PharmD, MS/PharmD or PhD/PharmD) affiliated with School of Business, School of Law or School of Public Health; however the semesters in which the students were taking course loads from the affiliated schools were excluded from the results. In order to exclude any speculations or estimates for expected hours of work, the students only completed information on the semesters they completed. Therefore, first year pharmacy students will only contribute information relating to their fall semester. Fourth year students did not include information on their fall semester as they were all on full-time assigned experiential rotations.

Outcome Measures

This study focused on factors that may be hypothetically related to academic performance. The authors identified plausible reasons that may affect the total time a student engaged in studying. The authors categorised extracurricular activities into two broad categories: PTE and professional organisation involvement. Two approaches were used to examine the effect of each non-academic activity and academic performance. The authors also looked at the combined effect of both non-academic activities on GPA.

The first analysis focused on factors that may promote positive or negative link to academic performance. For example, it was hypothesised that if students participated in PTE in pharmacy-related settings it may help reinforce classroom learning. To examine the effect of PTE on academic performance, the analysis used GPA as the dependent variable and included self-reported weekly hours worked as an independent variable in an unadjusted and an adjusted, multivariable model, controlling for possible confounders (described in Statistical Analysis). A second set of random effects model was used by categorising the number of hours for PTE into five-hour increments: 0-4 (reference), 5-9, 10-14, 15-19, 20-24, and 25+.

Two approaches were used to categorise professional involvement. To measure how time away from studying may be related to academic performance, the survey asked students to estimate number of hours devoted to each activity for both unadjusted and adjusted analyses. However, the authors hypothesise leadership positions such as president of a student chapter for an event may involve additional preparation time that may be harder to quantify. As part of the adjusted analysis, the number of leadership positions held were included in addition to self-reported general organisation activities hours as independent variables to determine whether there is an association between professional organisation involvement and academic performance.A random effects model was also used for professional involvement by categorising into five-hour increments: 0-4 (reference), 5-9, 10-14, 15-19, 20-24, and 25+.

The third analysis examined the effect of both PTE and professional involvement on academic success. In a second random effects model, 5-hour increments were also used with the highest value held at 35+ hours: 0-4 (reference), 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, and 35+.

Statistical Analysis

Descriptive statistics were calculated for all items. The *a priori* significance level was set at 0.05. Three time-series unadjusted and adjusted, multivariable regressions (with random effects) were performed to examine the relationship between GPA and PTE, GPA and participation in professional organisation, and GPA and combined activities. In the adjusted multivariable models, the study controlled for several sets of possible confounders associated with academic success and participation in extracurricular activities. One set included student characteristics and previous academic performance with the latter hypothesised to be associated with academic success. Previous literature has shown that pre-admission GPA is a positive predictor for academic success in a pharmacy program (Kidd & Latif, 2003; Meagher *et al*., 2006; Schauner *et al*., 2013). Furthermore, completion of a previous degree may also affect likelihood of graduation from a graduate program (Chisholm, 2001; Renzi *et al*., 2007, McCall *et al*., 2007. Thus, the final model adjusted for (a) student characteristics (age, gender, race/ethnicity); (b) previous academic performance (highest degree achieved, years of post- secondary education, pre-admission GPA, PCAT score, applicant type); (c) student status (full-time); and (d) the effect of time. Results presented in this article are from the unadjusted and adjusted models that held these characteristics constant.

Due to the longitudinal nature of the data and the differential progress of students through the four-year program (not all students had completed all four years), two assumptions about missing data were made. First, a non-missing (*e.g.* valid) value had to exist for GPA in order for that observation to be included. Second, if GPA was missing but a non-missing value (*e.g.* 0) was reported for PTE or professional organisation involvement, then the 0 was changed to missing – a subject could be a student and not work whereas the information was invalid if a subject entered work information for a semester without a corresponding GPA. Each observation was uniquely identifiable by student ID and semester. All analyses were performed using Stata/SE version 11.2 (College Station, TX).

Results

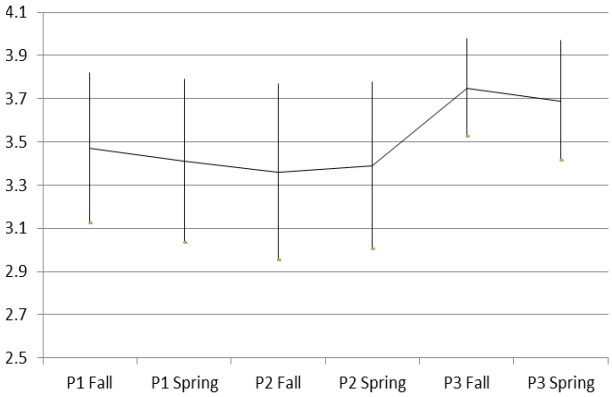
A total of 119 pharmacy students from a possible 490 consented to the study and completed the online survey. which included 27 first year, 32 second year, 26 third year, and 34 fourth year pharmacy students. Students provided data for all years they had been undertaking the pharmacy program. For example, a first year student would complete the survey based on their fall semester experience, whereas a second year student would provide information for two semesters during the first year and the fall semester of the second year. This represents a response rate of 24.3%. A total of 15 semesters worth of data were evaluated. Of the 119 participants, 61 (51.3%) did not have a previous degree. The majority of these students, 47/61 (77.0%), were admitted through the University's pre-pharmacy program (Early Assurance) which they applied for during initial admission to the University after high school. This group of pharmacy students had an average of 3.2 (range 2 - 9) years of post-secondary education prior to entering pharmacy school. The average age of the students was 23 (range 19 – 41). Eleven students (9.2%) had post-graduate degrees. Table I presents the student demographic information.

Table 1. Student Demographics (n=119)

Category	N (%)
Gender	
Female	78 (65.6)
Male	41 (34.5)
Race	
White	77 (64.7)
Asian	32 (26.9)
Other	10 (8.4)
Entry Degree	
No degree	61 (51.3)
Associate degree	2 (1.7)
Bachelor degree	45 (37.8)
Postgraduate degree	11 (9.2)

The average incoming GPA was 3.58 ± 0.31 on a 4-point scale. The average GPA for each year in pharmacy school is summarised in Figure 1. The average PCAT composite score was 83.16 ± 12.03. The majority of the first year pharmacy students did not work (66/119 [55.5%]). None of the students participating in this study worked full time. Of those students that reported work hours, approximately 93% (81/87) were employed in pharmacy-related positions. The top two reasons students reported for working are professional development (48/87 [55.2%]) and financial need (30/87 [34.5%]).

Figure 1. Grade Point Average by Semester



The number of students involved in professional organisations progressively declined, but of those who continued to be involved devoted more time each successive year in pharmacy school. The survey revealed 101 first year pharmacy students were involved in professional activities devoting on the average 6.31± 6.1 hours, but only 38 students were involved in extracurricular activities by the end of third year (8.13± 8.3 hours). Of the 38 students involved in extracurricular activities, 34 (89.5%) students held at least 1 leadership position. The primary reasons for being involved in extracurricular activities were professional development (70/119) and personal development (20/119) with one participant indicating both. Weekly part-time employments hours and hours devoted to professional extracurricular activities are summarised in Table II.

Table 2. Summary of Student's Weekly Hours Devoted to Employment and Professional Organisation Involvement

	n	Part-time Employment		Professional Organization Involvement	
		Mean ± SD	Median	Mean ± SD	Median
First year					
Fall	119	5.64 ± 7.30	0	5.31 ± 6.02	3
Spring	95	5.96 ± 7.24	0	3.95 ± 4.62	3
Second year					
Fall	90	8.03± 7.65	8	6.33 ± 7.38	4
Spring	89	6.15 ± 7.58	0	4.49 ± 6.92	2
Third year					
Fall	61	9.05 ± 7.53	9	6.10 ± 6.63	4
Spring	60	6.42 ± 7.48	4	4.83 ± 7.45	2

Abbreviations: SD=standard deviation

Predictors of Academic Performance

Table III provides an overview for the total samples relating work intensity and professional/extracurricular involvement to GPA. In the unadjusted models, we sought to quantify the effect of PTE, professional/extracurricular involvement, and a combination of both, respectively, on GPA while controlling the effect of time (based on semesters). The adjusted multivariable models adjusted for student characteristics, previous academic achieved performance, student status, and the effect of time. As expected pre-admission GPA had a positive and significant effect on GPA (p<.05); in contrast professional/extracurricular involvement had a negative effect on GPA (p<.05). The combined effect of both activities exhibit a negative effect in the unadjusted model (p<.05), but the effects were not significant when adjusted for student characteristics (p>.05). A comparison of the unadjusted and fully adjusted coefficients in Table III show that about 25% of the relations between GPA and professional/extracurricular involvement do not overlap with the other predictors.

Table III: Summary of Unadjusted and Adjusted Models for Part-time Employment and Professional Involvement

	Part-time Employment	Professional/ Extracurricular	Combined Effect
Unadjusted	-0.00144	-0.00645*	-0.00325*
Adjusted	-0.00147	-0.00484*	-0.00271

Note: Both the unadjusted and adjusted models were adjusted for time *p<.05

In the random effects model, pharmacy students working 5-14 hours per week did not have a significant difference in GPA compared to those working 0-4 hours (p>.05). Students working 15-19 hours experienced a negative effect on their GPA (p<.05). However, there was no significant difference in GPA for those working greater than 19 hours as compared to those working 0-4 hours (p>.05).

As for professional involvement, students devoting 5-14 hours per week did not have a significant change in GPA when compared to those devoting 0-4 hours (p>.05). While significance was found with spending 15-24 hours per week on professional activities (p<.05), significance was not confirmed in the adjusted analysis for committing 15-19 hours per week (p>.05). There was also no significant impact on GPA for devoting greater than 24 hours per week (p>.05).

The combined effect analysis determined that students spending 5-34 hours on extracurricular activities experienced no significant effect on GPA when compared to spending 0-4 hours (p>.05). Significance was observed, however, with those who devoted greater than 34 hours towards extracurricular involvement (p<.05). In the adjusted model, the association observed in the unadjusted model became non-significant (p>.05). Table IV compares the models in detail for each time increment.

Table IV: Random Effect Model for Part-time Employment and Professional Involvement

Hours/ week	Part-time employment		Professional/ Extracurricular		Combined Effect	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
0 – 4	Reference					
5 – 9	-0.0235	-0.0288	-0.0078	0.0161	0.0394	0.0463
10 – 14	-0.0227	0.0344	-0.0807	-0.0604	-0.0245	-0.0126
15 - 19	-0.0902*	-0.0983*	-0.1010*	-0.0775	-0.0157	-0.0177
20 - 24	-0.0043	-0.0061	-0.2470*	-0.2180*	-0.0847	-0.0804
25+	-0.1070	-0.1170	-0.1590	-0.1280	N/A	N/A
25 - 29	N/A	N/A	N/A	N/A	-0.0143	0.0034
30 - 34	N/A	N/A	N/A	N/A	-0.1120	-0.0957
35+	N/A	N/A	N/A	N/A	-0.1700*	-0.1470

Note. Both the unadjusted and adjusted models were adjusted for time *p<.05

Discussion

As the pharmacy job market becomes increasingly competitive, it is imperative for pharmacy students to distinguish themselves from their peers. Potential employers review each resume beyond the typical GPA because every applicant fulfills the basic requirements as a pharmacist if they successfully received a PharmD diploma and passed the NAPLEX. Therefore, this study tried to examine factors that may optimise pharmacy students' education without affecting their grades.

According to the 2012 application pool data reported by the American Association of Colleges of Pharmacy, 41.4% and 3% of pharmacy college school applicants held baccalaureate and postgraduate degrees, respectively (2013). This is similar to our student population. Our student population may have consisted of slightly more professional students as a result of the changes in economy. Students with degrees may represent returning students because there has been a shortage of pharmacists in the past.

There was a consistent decrease in students' cumulative GPA during the P2 year. This could be a function of the courses being more academically rigorous and more pharmacy intensive. Specifically, the P2 year includes an increased emphasis on courses in which the majority of students may not have had previous educational experiences (*e.g*. pharmacokinetics, pharmacology, pharmacotherapeutics, pharmacy care). This is consistent with a previous study that showed pharmacy students at this institution consistently had a decrease in cumulative GPA during the second year in pharmacy school Renzi *et al*., 2007)

This study demonstrates that the majority of full-time pharmacy students did not engage in extracurricular activities. The majority of students surveyed did not engage in PTE and a significant amount did not participate in professional activities. Interestingly, this study did not find a negative association between PTE and GPA. This seems to support PTE may reinforce classroom learning. However, when we categorise the PTE into five-hour increments, students working between 15-19 hours experienced a negative effect on their GPA. This finding is similar to another study conducted in graduate nursing students. In that study, nursing students performed worse academically if they engaged in PTE greater than 16 hours per week (Everett *et al*., 2013). This finding is consistent with previous research results that demonstrated students who worked between 1-15 hours per week are more likely to have a GPA greater than 3.5 as compared to their counterparts who worked longer hours (Horn & Maw, 1994). However, our study did not find a significant impact if a student works greater than 20 hours. This may suggest that students in this group were more committed to their study because of other factors that were not examined.

This study determined that professional and extra-curricular involvement negatively impacted academic performance in pharmacy students. However, there was no significant impact on GPA for students devoting greater than 24 hours per week, which may also suggest that these students were more dedicated to their academic studies for other reasons. It has been hypothesised that leadership involvement is essential for pharmacy students to grow professionally (Slack & Murphy, 1995). The American Society of Health-Systems Pharmacists (ASHP)(Pharmacists, 2011) and the 2008 – 2009 American Association of Colleges of Pharmacy (AACP) Argus Commission (Kerr *et a*l., 2009) encouraged schools to evaluate leadership potential as part of the admissions process. A previous study has shown students received higher pharmacy admission scores during the interview process when they were involved in organisations and held leadership roles. (Kiersma *et al*., 2011). The importance of leadership involvement stems from a movement supported by several professional organisations to solve a threatening health-systems pharmacy leadership crisis identified in 2004 (White, 2005; Kerr *et al*., 2009; Pharmacists, 2011). A seven-year follow-up study recently published has concluded that although the leadership crisis has been alleviated, continued emphasis on leadership is needed to avoid future potential crises. However, caution should be taken when encouraging extracurricular involvement during pharmacy school as it may be associated with a negative outcome in academic success.

Study Limitations

A major limitation is the small sample of students (n=5) working greater than 20 hours per week. This small sample may result in a Type II error: the failure to find an association between PTE and GPA when one actually exists. An additional limitation is the cross-sectional design of the study, which cannot imply direction of causality and limits the conclusions made from this study. The nature of our survey also introduces recall bias as students have to recall specific number of hours during specified semester(s) in pharmacy school. In recreation activities, participants have shown to overestimate their involvement by over 100% (Anderson & Smithyman-Kanters, 1988). It seems over inflation increases with length of recall period. Furthermore, although students were assured their information would be de-identified, there is potential for misleading data if students overestimate the amount of PTE and professional involvement to account for a lower GPA. Another limitation is the timing of the surveys. The surveys were distributed after final exam but before the beginning of the semester. The majority of the students may have neglected to fill out the survey due to stress associated with the exams or have been busy with the new semester. A further limitation is the fact that the data is from one pharmacy school only and the results may not be generalizable to all pharmacy schools. This study equated academic success with GPA, however those with lower GPAs may still have passed the NAPLEX.

Conclusion

Part-time employment may exert a positive or an adverse effect on academic success. A moderate amount of PTE is considered beneficial to complement academic

achievement when compared to no employment. This study found professional involvement may exert a negative effect on academic success. The influence of professional involvement may require further exploration to determine if type of involvement and type of organisation may influence the student's social development which may offset the impact on their academic development. Future studies should focus on factors that may influence success in pharmacy school and be ultimately concerned with their impact in the pharmacy profession.

Acknowledgement

The authors wish to thank Dr. Mark Wrobel for his valuable contributions and guidance during the entire study process, as well as Mr. Mark Sauberan for data collection and de-identification process.

Disclosures

The authors reported no funding for this manuscript and no financial or other potential conflicts of interest related to the subject matter of this manuscript. At the time of study design, Dr. Ho was Clinical Assistant Professor of Pharmacy Practice and Director of Retrospective Drug Utilization Review Program at University at Buffalo, Buffalo, New York.

Concept and design, data collection, and data interpretation, writing, and revisions were performed by Drs. Chan, Havard, Ho. Data analyses were performed by Dr. Ho and Mr. Thompson. Portions of this manuscript were presented as a poster abstract at the American Association of Colleges of Pharmacy (AACP) Annual Meeting in Chicago, Illinois on 13th July, 2013.

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