RESEARCH

Associations between Achievement Goal Orientations and Academic Performance Among Students at a UK Pharmacy School

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Objective. To ascertain goal orientations of pharmacy students and establish whether associations exist between academic performance, gender, or year of study.

Methods. Goal orientations were assessed using a validated questionnaire. Respondents were categorized as high or low performers based on university grades. Associations and statistical significance were ascertained using parametric and nonparametric tests and linear regression, as appropriate.

Results. A response rate of 60.7% was obtained. High performers were more likely to be female than male. The highest mean score was for mastery approach; the lowest for work avoidance. The mean score for work avoidance was significantly greater for low performers than for high performers and for males than for females. First-year students were most likely to have top scores in mastery and performance approaches.

Conclusion. It is encouraging that the highest mean score was for mastery approach orientation, as goal orientation may play a role in academic performance of pharmacy students.

Keywords: academic performance, achievement goals, pharmacy students

INTRODUCTION

For students to learn and perform effectively, they must be sufficiently motivated.^{1,2} Motivation is required for students to develop into independent learners and, as future pharmacists, such learning would help enable fulfilment of statutory continuing professional development requirements.³ Moreover, Perrot et al revealed that students in health care disciplines demonstrated changes in motivation as they progressed through their educational programs.⁴

For more than 30 years, achievement goal theory has been a key theory in the field of education to explain student motivation for achieving.^{5,6} It was initially postulated that there were 2 types of achievement goals that illustrated contrasting abilities of students: task-involved and ego-involved. Task involvement was mastery-oriented in that the individual's ability to succeed was based on personal gain, irrespective of others. Ego involvement differed in that a student's approach toward ability was comparative—that is, relative to others' performance.⁷

Elliot and McGregor designed a 4-factor conceptualization of achievement goals that encompassed a mastery-performance dimension with an approach-avoidance dimension: mastery approach, trying to attain competence

relative to the task or personal standards (students are motivated to learn or develop skills); mastery avoidance, trying to avoid incompetence relative to the task or personal standards (students are motivated to avoid failures or become de-skilled); performance approach, trying to attain competence relative to one's peers (students are motivated to outdo others or to be considered talented); performance avoidance, trying to avoid incompetence relative to one's peers (students are motivated to avoid doing worse than others or to be considered less talented).⁸

Individuals who have a mastery-approach orientation feel competent at a task when they have mastered the task itself or when they have improved relative to their own past performance. Those who have a performance-approach orientation feel competent at a task when they have performed well on the task relative to others. Mastery-oriented learners may choose harder tasks to ensure they have an overarching knowledge of the subject area. Conversely, students who are performance-oriented learners may opt for easier tasks for which success is guaranteed. Another goal orientation referred to in the literature is "work avoidance."^{9,10} Students who are work-avoidant aim to minimize the effort required to learn and perform.^{8,11}

Elliot and McGregor's achievement goal questionnaire (AGQ) and Elliot and Murayama's revised version (AGQ-R) are widely used to assess students' achievement goals.^{8,12} Both instruments were developed and validated

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on US undergraduate psychology students, although Alrakaf et al's study on pharmacy students in Australia, New Zealand, the United Kingdom (UK) and the United States argued that the AGQ is a more psychometrically robust measure than the AGQ-R.¹³

The "Attitude Toward Learning and Performance in College This Semester" (ATL) questionnaire was introduced by Pieper in 2003.¹⁰ It incorporated questions adapted from the AGQ with 4 additional items previously used by Harackiewicz et al, which measure the additional work-avoidance parameter.⁹ The ATL questionnaire has been employed for research involving university students and goal orientation.^{14,15}

The primary aim of this study was to explore associations between student goal orientation scores and academic performance, gender, and level of study. A secondary objective was to determine whether there were any relationships between goal orientations and students' views on various aspects of pharmacy practice. Limited work is available in the area of achievement goal orientations among pharmacy students, particularly in the UK, where undergraduate pharmacy students normally commence 4-year master of pharmacy (MPharm) programs immediately after finishing their secondary education in school or college (typically at around 18 years of age). From a pharmacy educators' stance, however, such work is important in understanding student motivation, given how it appears to influence development of life-long, self-directed learning skills, help-seeking behaviors, intensive studying strategies, and self-efficacy.^{5,16-19} Furthermore, to the best of our knowledge, few studies have explored the association between achievement goal orientations and academic performance (students' grades) in pharmacy students (particularly in the UK), although Alrakaf et al conducted research on the subject among pharmacy students in Australia.²⁰

METHODS

The School of Pharmacy Ethics Committee at Queen's University Belfast (QUB) approved the proposed research. Data were collected using an electronic questionnaire created with SurveyGizmo (SurveyGizmo, Boulder, CO). The attitude-toward-learning questionnaire was used to measure students' goal orientations. This is a self-administered validated instrument with 16 items scored on a 7-point Likert scale ranging from 1 = not at all true of me to 7 = very true of me (except Question 16, which was reverse-coded). Some questions were revised in a minor way for face validity (ie, the specific semester-based nature of the questions was removed, and terms were adapted to make them more relevant for UK university students (for example, "module," which is used to represent a specific component of the degree

program). The questionnaire consisted of 3 sections: Section A was the validated questionnaire questions described above. Section B contained 4 questions related to professional issues (preparation for module examinations, whether motivation was related to professional practice or other aspects of pharmacy, preferred career path following registration as a pharmacist, and the importance of keeping up-to-date with practice developments in pharmacy). Section C contained 2 questions that gathered de-identified demographic information on gender and level of study. The majority of questions was closed-response and used the 7-point Likert scale.

The study population included all students enrolled in the MPharm program at QUB (N=529) (ie a census approach was used). The questionnaire was pilot-tested on postgraduate pharmacy students (n=10) to ensure it could be completed within 5 minutes and that questions were clear and unambiguous. In February 2014, students were invited via e-mail to participate. They had 14 days to complete the questionnaire and were given a deadline. The e-mail contained a unique link to the questionnaire, which allowed each student to complete the questionnaire once only. Students were informed that participation in the study was voluntary. The original e-mail invitation was followed up with 2 reminders, which were sent to nonrespondents and included a statement that other students had already responded.¹⁹ Additionally, to maximize the response rate, an incentive (a drawing for 1 of 20 copies of a recommended formulary used at the school and in pharmacy practice across the UK) was mentioned in the invitation.²¹

As this study also aimed to explore the link between academic performance and goal orientations, additional data relating to student marks (grades) was used. This data was obtained via the university student information system, to which all faculty members at the school have access.

To include student grades in the analysis and maintain anonymity of the questionnaire responses, unique questionnaire ID numbers were randomly generated for each student and uploaded, along with student e-mail lists, to the SurveyGizmo site. Data from questionnaire responses were downloaded to Microsoft Excel and, using the unique ID numbers, mean weighted grades were added to the worksheet. Responses could not be traced back to individual students.

Mean scores for each goal orientation were calculated. Student respondents were allocated into 1 of 2 academic performance groups: high performers (those who scored a mean weighted grade of $\geq 70\%$) and low performers (those who scored a mean weighted grade of $< 70\%$). This cut-off point was chosen because it corresponded to the First Class Honours degree, the highest

category of MPharm classification at the university. Statistical analysis and comparisons of mean goal orientation scores in relation to gender, pharmacy year, and academic performance were conducted via the *t* test, ANOVA, and Chi-square test using R. The relationship between academic performance (students' grades) and goal orientation was further investigated using a linear regression model. An a priori level of $p < 0.05$ was set as significant. Reliability of the goal orientation question sets was measured using Cronbach alpha, where a coefficient alpha of 0.8 or greater was considered good reliability.²² Moreover, to test the validity of the goal orientation questions, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed. The latter was conducted using the lavaan (latent variable analysis, v0.5-17) R package to assess the model's quality of fit to the data. The Tucker Lewis index (TFI), Comparative Fit index (CFI) and root mean square error of approximation (RMSEA) fit indices are commonly used with desirable values TFI > 0.9, CFI > 0.9, and RMSEA < 0.06.²³

RESULTS

The study had a response rate of 60.3% (319/529). The 319 respondents were students who fully completed the questionnaire. Seven questionnaires were sparsely completed and were not included in the analyses. There were fewer male than female respondents (93/319 (29.2%) males; 226/319 (70.8%) females), and these numbers reflected the population of students enrolled in the degree program (186/529 (35.2%) males; 343/529 (64.8%) females). Response rates for first-year to fourth-year students were 39.3% (44/112), 59.6% (81/136), 64.9% (96/148), and 73.7% (98/133), respectively. Respondent age was not sought in the questionnaire as almost all (>99%) students were in the 18-23 age bracket, having commenced the MPharm degree immediately after completing secondary education. Only 19.4% (62/319) of student respondents were categorized into the high performer group (those with a mean weighted mark of $\geq 70\%$) and the remaining 80.6% (257/319) were allocated into the low performer group. Students in the high performer

group ($n=62$) were more likely to be female than male (52 vs 10; $p=0.018$). Descriptive statistics showing goal orientation scores of students are provided in Table 1. The highest mean score was achieved for the mastery-approach orientation and the lowest for the work-avoidance orientation.

Results of the comparisons between goal orientations and level in the pharmacy degree program, gender, and academic performance are outlined in Table 2. Of the 5 goal orientations, the mean scores in work avoidance were significantly greater for low performers than for high performers and for male than for female students. Additionally, of the 19.4% (62/319) of respondents who were categorized as high performers, only 4.84% (3/62) had a work avoidance score ≥ 16 . Moreover, the mean scores in the mastery approach and performance approach orientations differed significantly across the 4 groups, with first-year students obtaining the highest mean scores in both of these orientations (Table 2). When the relationship between academic performance (students' grades) and goal orientation was investigated, only mastery avoidance and work avoidance were found to be statistically significant using a linear regression model (mastery approach, $p=0.232$; mastery avoidance, $p=0.002$; performance approach, $p=0.054$; performance avoidance, $p=0.323$; work avoidance, $p=0.006$).

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In terms of testing the validity of the goal orientation questions, extracted components from factor analysis accounted for 59% of total goal orientation variance. Performance approach explained 16% and mastery approach

Table 1. Descriptive Statistics Showing Goal Orientation Scores of Students ($n=319$)

Goal Orientation	Question Numbers	Mean Score (SD)	Median Score	Possible Score Range ^a	Cronbach Alpha (0.80 overall)
Mastery Approach	3,7,10	16.1 (3.1)	16	3-21	0.80
Mastery Avoidance	5,11,14	15.6 (3.8)	16	3-21	0.75
Performance Approach	1,6,12	14.0 (4.9)	15	3-21	0.92
Performance Avoidance	2,8,15	15.8 (3.6)	16	3-21	0.59
Work Avoidance	4,9,13,16	11.3 (4.5)	11	4-28	0.71

^aResponse scale range: 1=not true of me...7=very true of me (except Question 16 which is a reverse-coded item)

Table 2. Relationship of Goal Orientations and Level in the Program, Gender, and Academic Performance

	Mastery Approach	Mastery Avoidance	Performance Approach	Performance Avoidance	Work Avoidance
	Mean Score (SD)				
Pharmacy Year					
1 (n=44)	17.5 (2.7)	16.3 (3.9)	15.3 (4.6)	15.4 (4.1)	10.9 (4.2)
2 (n=81)	15.6 (3.2)	15.5 (3.6)	14.3 (4.6)	15.1 (3.6)	11.9 (4.5)
3 (n=96)	15.9 (3.1)	15.6 (3.6)	14.6 (4.5)	16.2 (3.1)	11.0 (4.6)
4 (n=98)	16.0 (3.2)	15.5 (4.1)	12.7 (5.4)	16.1 (3.8)	11.2 (4.7)
p value	0.009	0.7	0.008	0.2	0.5
Gender					
Male (n=93)	15.9 (3.1)	15.2 (3.6)	14.4 (4.8)	15.5 (3.3)	12.8 (5.5)
Female (n=226)	16.2 (3.2)	15.8 (3.9)	13.9 (5.0)	15.9 (3.7)	10.7 (3.9)
p value	0.5	0.2	0.4	0.3	<0.001
Academic Performance					
High Performers (n=62)	16.6 (3.3)	15.0 (4.4)	14.5 (5.2)	15.5 (4.0)	10.3 (3.5)
Low Performers (n=257)	16.0 (3.1)	15.8 (3.6)	13.9 (4.8)	15.8 (3.5)	11.5 (4.7)
p value	0.2	0.2	0.4	0.5	0.02

explained 13% of the total variance. Work avoidance, mastery avoidance and performance avoidance accounted for 12%, 11%, and 7% of the total variance, respectively (see Table 3, which also includes the mean scores for each goal orientation question). The extracted factors reflect the design of the goal orientation questions and are labeled as such. Furthermore, CFA results of TFI=0.921, CFI=0.938, and RMSEA=0.068 suggest the model is a reasonable fit.

When asked about preparing for module examinations, 83.4% (266/319) of respondents reported they tried to learn all the material, whereas 16.6% (53/319) only learned topics they thought would be on the examination. There was no significant difference between the responses to this question and academic performance.

The mean score for the statement "I think it is important for pharmacists to keep up-to-date with practice

Table 3. Goal Orientation Items and Their Corresponding Factor Loadings

Item	Mean Score	PAP	MAP	WAV	MAV	PAV
1. My goal is to get better grades than most of the other students. (PAP)	4.5	0.88				
6. It is important for me to do well compared to other students. (PAP)	4.9	0.78				
12. I want to do better than other students. (PAP)	4.7	0.90				
3. Completely mastering the material in my modules is important to me. (MAP)	5.0		0.76			
7. I want to learn as much as possible. (MAP)	5.8		0.68			
10. The most important thing for me is to understand the course content as thoroughly as possible. (MAP)	5.3		0.70			
4. I really don't want to work hard in my modules. (WAV)	2.1			0.54		
9. I want to do as little work as possible. (WAV)	2.6			0.84		
13. I want to get through the course by doing the least amount of work possible. (WAV)	2.5			0.90		
16. I look forward to working really hard in my coursework. (WAV)	4.0		-0.41			
5. I'm afraid that I may not understand the content of my modules as thoroughly as I'd like. (MAV)	5.2				0.49	
11. I worry that I may not learn all that I possibly could. (MAV)	5.3				0.78	
14. I am definitely concerned that I may not learn all that I can. (MAV)	5.1				0.79	
2. I just want to avoid doing poorly compared to other students. (PAV)	5.1					0.63
15. My goal is to avoid performing poorly compared to other students. (PAV)	4.8	0.51				0.75
8. The fear of performing poorly is what motivates me. (PAV)	5.9					

^aFactor loadings of magnitude below 0.4 have been suppressed in the table

MAP=mastery approach, MAV=mastery avoidance PAP=performance approach, PAV=performance avoidance, WAV=work avoidance

developments” was 6.23 (possible score range 1-7), and the mean score for the statement “I am more motivated to learn about aspects of pharmacy that relate to professional practice than other aspects of pharmacy” was 5.22 (possible score range 1-7).

After completing preregistration training (the training year in the workplace after graduation from university, prior to registration (becoming licensed) in the profession), 41.7% (133/319) stated they would like to work as a community pharmacist, 35.7% (114/319) as a hospital pharmacist, 15.4% (49/319) wanted to return to university for further study, and 7.2% (23/319) stated “other,” which included industrial pharmacy, becoming a musician, and travelling. Students who stated they wished to become a hospital pharmacist were least likely to be work avoidant, whereas those who chose “other” or “returning to university” were more likely to be work avoidant (work avoidance mean scores: hospital pharmacist=10.39, community pharmacist=11.34, return to university =12.20, other=13.48; $p=0.016$).

DISCUSSION

This study revealed many interesting findings in relation to both goal orientations and academic achievements of pharmacy students. It was encouraging to note that the highest overall mean score was achieved for the mastery-approach orientation and the lowest was for the work-avoidance orientation. This would be expected of any student hoping to enter a health care profession, and these findings are similar to those reported in other studies involving medical, nursing, and pharmacy students.^{4,24-26} However, it is concerning that the highest mean scores among third-year and fourth-year students were for the performance-avoidance orientation, as this orientation is linked to negative characteristics, such as low intrinsic motivation.²⁷

It was reassuring to ascertain that the majority of students reported trying to learn all the material when preparing for module examinations rather than question spot and that students considered it important for pharmacists to keep up to date with practice developments. It was also noteworthy that students seemed to be more motivated to learn about aspects of pharmacy related to professional practice than other aspects of pharmacy. Therefore, it would be useful for course faculty members to reiterate the importance of all components of the degree and outline how the particular subject area relates to practice, be it community, hospital, industry, or any other pharmacy setting. Core scientific subjects, such as physical and organic chemistry, should be taught in a pharmacy context, rather than in isolation.

Low performers (more male than female) were more likely than high performers to have a high score for work avoidance. Furthermore, from the linear regression model,

it appeared that mastery avoidance and work avoidance were important factors in relation to students’ grades. Our findings on work avoidance and academic performance appear to mirror those of Barkur et al, who conducted a study with medical students ($n=244$) in India.²⁸ However, their academic performance groups were categorized differently, so meaningful comparisons cannot be drawn. The same was true for gender in our study; in general, males were more likely to be work avoidant. Perrot et al also found significant differences with regard to gender, with male students more likely than females to be performance oriented.⁴ In contrast, a study among pharmacy students in the United States by Gavaza et al found no significant difference between genders in terms of goal orientation, although males did score higher than females for work avoidance.²⁴ Understanding differences in goal orientations is important for teaching. For example, students more performance-oriented (approach or avoidance) than mastery oriented or work avoidant may benefit from having peer performance included on feedback and from participating in teaching competitions to improve motivation to learn. However, this approach would mainly benefit performance-avoidant students underperforming relative to their peers.

The mean scores in the mastery-approach and performance-approach orientations differed significantly across the 4 groups, with first-year students obtaining the highest mean scores in both of these. Goal orientation change as pharmacy students progress through the degree program is noted in the literature.^{18,25} Perhaps first-year students are naïve and apprehensive, having just transitioned from secondary to tertiary education, and are therefore motivated to try to learn everything in order to perform well. Unfortunately, Hastings et al found that pharmacy students developed an attitude of “only learning what was necessary to pass” as they progressed through the curriculum.²⁵ Maybe if students were assessed on a greater proportion of the degree course (and not given the option to select certain questions, avoiding other topics completely), this mind-set would diminish. A reduction in a mastery approach over the 4 years may concern educators and the profession. In fact, if this goal orientation score continues to decrease, the likelihood of a student partaking in lifelong learning to remain up-to-date with practice developments might be jeopardized.

Interestingly, students who stated they wished to return to university for further studies were more likely than those choosing other career pathways to be work avoidant. Returning to university for further study (such as a PhD) may be considered an easier option than starting a full-time career as a pharmacist in either hospital or the community. This is not necessarily a positive finding for

academics investing time and effort supervising such students. Additional research could be conducted to establish what motivates students to choose to study pharmacy and what drives them to select a particular career path.

In terms of limitations, the questionnaire provided an insight into respondents' reported behavior rather than actual behavior, and their opinions were obtained at one point in time only. Secondly, the study was conducted in one pharmacy school in the UK, therefore the results may not be generalizable to other areas of the UK or of the world. Thirdly, we did not collect data on whether respondents were from the UK or were from other countries as the small numbers of international students in years 3 and 4 of the program could have compromised anonymity; however, ethnicity is known to affect goal orientation and academic achievement.²⁰ There was an underrepresentation of years 1 and 2 students and nonresponse bias cannot be ruled out. However, the response rate of 60.1% was considered satisfactory, particularly in light of guidance from Fincham, who stated that "response rates approximating 60% should be the goal of researchers."^{29,30} Reliability of the instrument, as determined by Cronbach alpha, was low for performance avoidance but reasonable for the other orientations. There were fewer students in the high performer group than the low performer group, which may have weakened the ability to detect true differences. Additionally, assigning a 70% cut-off for a high performer vs a low performer was subjective. However, the research does add to the field and could be valuable to educators of various health care disciplines as it provides new information about pharmacy students in the UK and how factors such as gender, pharmacy year, and academic performance correlate with goal orientations.

CONCLUSION

The pharmacy students in this study had a robust work ethic, which could prove valuable when they qualify (become licensed) as health care professionals, even though mean mastery approach scores were lower in the fourth-year cohort than in the first-year cohort. Mastery-avoidance and work-avoidance orientations were important factors in relation to grades. As previously discussed, a work avoidance orientation may go some way to explaining why female students out-performed male students on the pharmacy course. Achievement goal orientations seem to play a role in academic performance of undergraduate pharmacy students. Educators should ensure that work avoidance is not encouraged or rewarded by including compulsory assessments that test both depth and breadth of knowledge across the curriculum. Such assessments may also better prepare students to be lifelong learners. Qualitative research to explore what motivates students

to choose to study pharmacy and to investigate goal orientations could be valuable.

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