



Contents lists available at ScienceDirect

Currents in Pharmacy Teaching and Learning

journal homepage: www.elsevier.com/locate/cptl

Research Note

Association between physical activity and grade point average among a cohort of pharmacy students in didactic years

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ARTICLE INFO

Keywords:

Physical activity
Grade point average
PharmD students
Learning capacity
BMI

ABSTRACT

Introduction: The physical activity (PA) behavior and its association with academic performance has not been examined among professional pharmacy (PharmD) students in didactic years.

Methods: A survey was administered to a cohort of PharmD students at University of Houston that collected information related to each student's PA and grade point average (GPA). Correlation analyses and multiple regression were performed to evaluate factors associated with GPA.

Results: The response rate was 58.1%. Stepwise multiple regression indicated that learning capacity and gender were major predictors for GPA. There was no significant association between PA and GPA.

Discussion and conclusions: Higher learning capacity and lower body mass index (BMI) were associated with higher GPA in PharmD students in their didactic years. Strategies such as engaging students in moderate to vigorous PA may enhance learning capacity and lower BMI; this may further positively influence students' GPA. In addition to an emphasis on academic competence, pharmacy education that can better incorporate exercise would help students establish regular PA behaviors. This may improve their health outcomes and facilitate future patient counseling practices.

Introduction

As the role of pharmacists evolved over time, pharmacy education became more integrated and comprehensive.^{1,2} Professional doctor of pharmacy (PharmD) degree programs now incorporate both science courses and advanced pharmacy practice experiences, in order to equip students with the foundational knowledge and skills that are essential to provide patient-centered care.¹ The main metric used to measure a student's competency is his/her cumulative grade point average (GPA).³ A higher GPA represents greater academic performance and implies better comprehension of knowledge. With more rigor in the curriculum, achieving academic success is becoming more difficult. Thus, educators and researchers have investigated extensively on how various factors affect students' GPA, in order to develop effective strategies to help students improve their GPA.^{3–5} However, there is a lack of evidence on the role that physical activity (PA) plays in the academic performance of PharmD students.

GPA is the preliminary criterion to measure a PharmD student's competency. To fully assume their future role as health care practitioners, PharmD students not only need to become medication experts but also be able to provide patient-oriented care.¹ As future pharmacists who will have the opportunity to interact with a large patient population, students need to be aware of exercise programs and the value of PA promotion.⁶ Counseling patients on adopting and maintaining healthy lifestyles, such as PA, is an

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<https://doi.org/10.1016/j.cptl.2017.11.007>

integral part of their responsibilities of health promotion and improving patient outcomes.⁷ Previous research indicates that physicians' and medical students' PA behavior could positively influence their counseling practice and motivate patients to implement healthy lifestyle behaviors.⁸⁻¹⁰ By the same token, the PA behavior of PharmD students can potentially affect their counseling practice in the future. By exhibiting regular PA behaviors, pharmacists would impart their beliefs of healthy lifestyles, convey consistency with their counseling messages, and gain more trust from patients.¹ And therefore, it is important that PharmD students take regular exercise. However, their PA behaviors have not been examined.

Though regular exercise is important for students, most schools mainly focus on improving students' GPA. Previous researches have suggested a negative association between sedentary behavior and academic achievement,¹¹ whereas a positive relationship between PA and cognitive function and/or academic achievement in children and adolescents.¹¹⁻¹⁵ Regular PA is associated with a measurable improvement in neuropsychological tests of executive functions, which play an important role in complex behavior, and may contribute to academic and career achievement as well as success in social interaction.¹⁶ Emergent studies have looked at this PA-GPA association among medical students, nursing students, and health science graduate students.¹⁷⁻²¹ PA habits were positively related to high GPA among medical students.¹⁷ However, the impact of PA on the GPA of PharmD students has not been examined before. Due to the lack of research on pharmacy students, and in the hope of developing intervention programs to enhance both PA and GPA, we aimed to investigate the PA behavior in a cohort of PharmD students and its effect, if any, on their GPA.

Methods

Design

This was a cross-sectional study. A self-reported survey was designed to address the research objectives. The study design was reviewed and approved by Institutional Review Board (IRB) on ethics of human research at University of Houston.

Sample

PharmD students in their second and third years (P2 and P3, respectively) at University of Houston were approached. First-year (P1) students were not included since they did not achieve a cumulative GPA record with the college during the data collection period. Students in their experiential year (P4) were excluded, because they differed from students of didactic years in both academic curriculum and daily activities.⁵ A total of 241 students (total enrollment of P2 and P3 students) were potential participants, with more females ($n = 159$, 66.0%) than males. Their average (SD) age was 24.8 (± 3.5), ranging from 20 to 46. More than half of them ($n = 143$, 59.3%) were between 20 and 25 years' old, 32.8% ($n = 79$) of them were between 25 and 30, and only 7.9% ($n = 19$) were above 30 years of age. The majority were Asian ($n = 131$, 54.4%), followed by white ($n = 59$, 24.5%). For confidentiality reasons, the researchers could not access their official academic records. The researchers were also unable to obtain other socio-demographic information, such as working status, which may influence their time spending on studying and PA. It is worth noting that the university strives to provide necessary resources to meet students' needs. There is a recreation center at the main campus, which is available to all students at the university. However, pharmacy students take some of their core courses at the Texas Medical Center campus, which may restrict their use of exercise resources from the main campus.

Setting

Data was collected between November and December 2015 at University of Houston. A convenience sampling procedure was used. Surveys were administered before the instruction time of the respective courses for each of the pharmacy student groups by year of enrollment. Prior permission was obtained from the professors of those courses to distribute the survey. Before administering the survey, a recruitment letter was read to the students and a statement of anonymous consent letter was distributed to assure the confidentiality and voluntariness of this study. After completing the questionnaire, each participant was asked to fold it and put it into a collection box left in the classroom. This was to ensure all the data were collected in aggregate form and no individual information would be identified. It took approximately five minutes for each participant to complete the questionnaire.

Instrument

The survey questionnaire was divided into four sections. Section one inquired about participants' involvement in PA, inclination to exercise, and major barriers preventing them from exercise. In section two, participants were asked to report their cumulative GPA, as well as height and weight to calculate BMI. BMI was calculated as weight over squared height (kg/m^2). Section three probed about participants' study time, study motivation, and learning capacity. And the last section collected information regarding age, gender, marital status, race, and year of enrollment (P2-P4). A pre-test was conducted among non-pharmacy students at the university to ensure the wording of the questionnaire was understandable and clear. Changes were made accordingly in places of ambiguity.

Individuals have diverse PA patterns and there was no consensus on the exact amount or intensity of PA that would ensure maximal benefits. In our study, we used six items from the International Physical Activity Questionnaire (IPAQ) short form to measure weekly time spent on PA.²² The last item of the IPAQ was not included since we were not interested in studying sitting activity. The IPAQ short form is a standard questionnaire designed to investigate PA behavior for individuals aged between 15 and 69.²² Its validity and reliability was assumed as reported previously.^{22,23} PA was categorized as vigorous-intensity, moderate-

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