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Abstract

Purpose: The purpose of this study was to determine whether a physical therapy student's level of grit positively correlates to graduate school grade point average. **Methods:** Participants were a convenience sample recruited from the class of 2021 in the Doctor of Physical Therapy program at Franklin Pierce University in Goodyear, Arizona. Subjects completed the Short Grit Scale (Grit-S) as a measure of grit. These scores were compared with participants' graduate school grade point average using a Spearman Rho statistical test with data analysis completed using SPSS software. **Results:** 27 participants (15 males, 12 females) with mean grit score of 3.76 ± 0.48 and mean grade point average 3.72 ± 0.18 . Spearman Rho correlation was .463 ($p < .05$). **Conclusion:** A significant moderate positive correlation between grit and graduate school grade point average in physical therapy students was found. These findings indicate preliminary evidence that may be useful for admissions considerations for DPT programs.

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ABSTRACT

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Keywords: grit, grade point average, physical therapy, admissions

INTRODUCTION

It is of perennial interest for Doctor of Physical Therapy programs to select student applicants suitable for the academic rigor of graduate level studies. Currently, physical therapy student capabilities are measured primarily by undergraduate grade point average and Graduate Record Examination scores with only a secondary focus on recommendation letters and submitted essays.¹ Conspicuously absent is a character assessment indicative of a student's prospective success. Scholastic achievement is determined not only by intellectual aptitude but also the presence of particular non-cognitive personality traits.² A growing area of research involves consideration and measurement of these non-cognitive traits for graduate students.²⁻⁴

One of the most salient and determinant measures of these characteristics is grit. University of Pennsylvania psychology professor Angela Duckworth defines grit as "the tendency to sustain interest in and effort towards long-term goals"⁵. Duckworth has developed and extensively published an empirically validated Grit Scale (Grit-S) questionnaire for quantifying grit in individuals.⁵

Research utilizing this scale has revealed a positive correlation between grit and academic performance across a variety of domains including undergraduate studies, medical school, pharmacy school, and other doctorate programs in business, education and psychology.⁶⁻⁸ Research from Calo et al compared grit levels of physical therapy, medical, nursing, and pharmacy students with recommendations that future research should focus on potential correlations between grit and academic performance.⁹ Grit has been shown to correlate with more effective stress coping among health profession students suggesting a greater capacity to thrive in challenging academic environments.¹⁰ Miller-Matero et al demonstrated a positive correlation between grit levels and academic performance in medical students.⁶ Furthermore, Palisoc et al found that pharmacy students with higher grit scores were more likely to pursue postgraduate training with higher rates of academic success.¹¹

To this end, including student's grit scores would provide a more complete student profile by revealing their potential to cope with the many stressors associated with achieving academic success. The most accurate appraisal of student abilities will maximize program outcomes and ultimately produce effective physical therapy clinicians. To date, no research has investigated the correlation between grit and academic performance among physical therapy students. It is the purpose of this study to determine the correlation between graduate level grade point average and grit in Doctor of Physical Therapy students.

Methods

Participants

Participants included a convenience sample of 27 student volunteers (15 females) with age range 23-34 years of age recruited from the 2021 Arizona cohort of the Franklin Pierce University Doctor of Physical Therapy Program at the Arizona Campus.

Data Collection

Approval from the Franklin Pierce University Institutional Review Board was granted prior to data collection. Participation was voluntary and all participants completed a consent form before proceeding to an online survey. The validated Short Grit Scale (GRIT-S) was accessible to all participants via encrypted online survey.⁵ The Short Grit Scale developed by Angela Duckworth is a self-reported questionnaire in which participants assess their consistency of interest, level of passion, and perseverance in the context of obtaining long-term goals indicated via a 5-point Likert Scale. The Likert Scale has been shown to have predictive validity and test retest reliability.⁵ The scale includes 8 items with scores ranging from one to five corresponding to "not like me at all" to "very much like me," respectively. Furthermore, questions are keyed as either positive or negative referring to the score marked on that particular question as either raising or lowering the subject's overall grit score. (See Table 1 for the positively and negatively keyed items.) After accounting for the positive and negative values for each question, the remaining value is averaged to obtain the subject's overall grit score. The maximum score on this scale is 5 (extremely gritty), and the lowest score on this scale is 1 (not at all gritty). Grit scores were then linked to the corresponding participants graduate grade point average by the principle investigator. Cumulative grade point average from all classes in the first six terms of the graduate DPT curriculum were used. Participants were de-identified to ensure participant anonymity.

Data Analysis

Analysis for differences in grit scores between genders was performed using a Mann Whitney U test. Analysis for differences in grade point average scores between genders was performed using an unpaired t test. Means were calculated for grit scores and grade point averages. Grit scores were compared with graduate school grade point average utilizing a Spearman Rho analysis using SPSS version 25.

Table 1. Short Grit Scale questions are keyed as either contributing to a higher grit score (positively keyed) or reducing grit score (negatively keyed items).

Positively Keyed Items	Negatively Keyed Items
I am diligent.	New ideas and projects sometimes distract me from previous ones.
Setbacks don't discourage me.	I have difficulty maintaining my focus on projects that take more than a few months to complete.
I finish whatever I begin.	I have been obsessed with a certain idea or project for a short time but later lost interest.
I am a hard worker.	I often set a goal but later choose to pursue a different one.

RESULTS

Sample Characteristics

Participants included 15 females and 12 males with a mean age of 26 ± 3.36 ranging from 23-34 years of age. Results from the Mann-Whitney U test showed that effects of sex differences on grit scores ($p = .368$) were insignificant and an unpaired t-test showed that effects of sex differences on grade point average ($p = .252$) were insignificant.

Table 2. Grit and GPA Scores

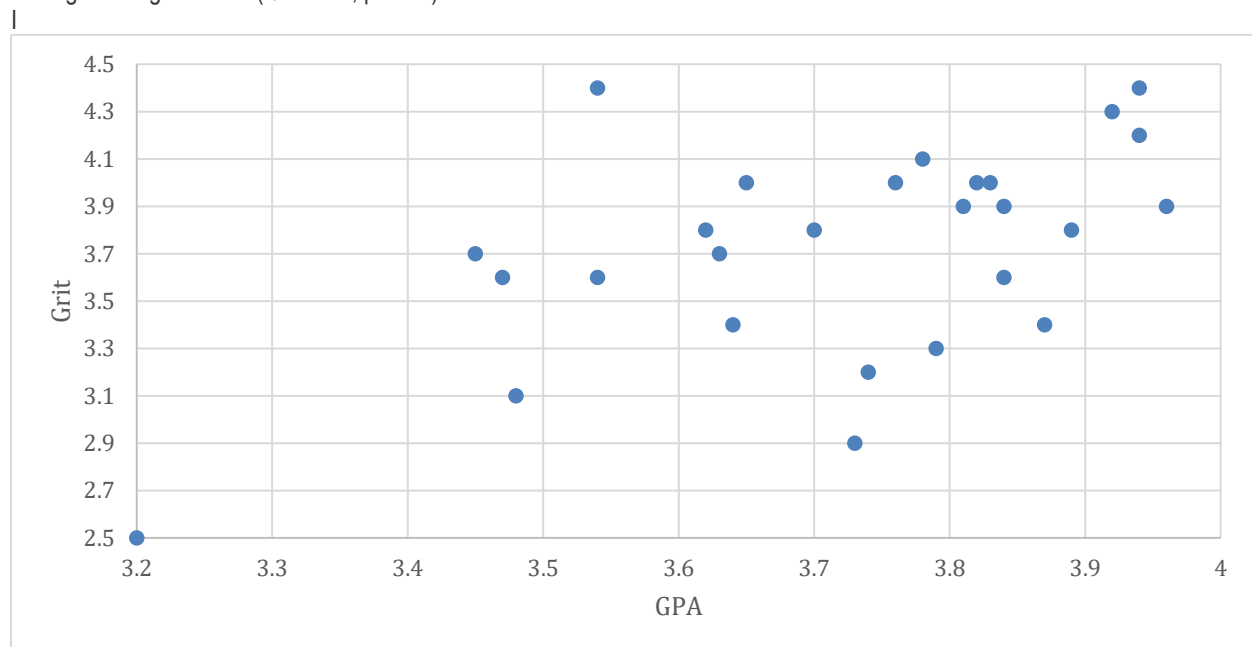
Characteristic	N	Minimum	Maximum	Mean	Std. Dev.
Grit	27	2.50	4.40	3.72	0.45
GPA	27	3.20	3.96	3.72	0.18

Grit Score Analysis

Mean grit score for all participants was 3.72 ± 0.45 . Grit scores were calculated with average of scores for four positive and four negative scored items.

Grade Point Average Analysis

Mean grade point average for all participants was 3.72 ± 0.18 . A Spearman Rho analysis was utilized to determine the relationship between grade point averages and grit score values. There was a moderate, positive significant correlation between grade point averages and grit scores ($r_s = 0.462$, $p < 0.05$).

**Figure 1.** Scatter Plot Graph of Correlation Analysis findings

DISCUSSION

The purpose of this study was to examine the correlation between grit and grade point average in Doctor of Physical Therapy students. Grit is paramount in Doctor of Physical Therapy students evidenced by nearly eight years of required post-secondary education, and this conclusion aligns with previous research that expounds the importance of grit in high levels of academic achievement.³⁻⁹ We found the average grittiness among Franklin Pierce University physical therapy students to be 3.72 ± 0.45 , slightly higher than previous research from Calo et al who found physical therapy students averaged 3.56 ± 0.65 .⁹ Although this study is the first, to our knowledge, that specifically examined the relationship between grit and grade point average in physical therapy students, other studies have examined the correlation between grit and other scholastic achievement markers in graduate school programs and found similar, positive correlations.^{6-8,11} Understanding the correlation between grit and academic success in physical therapy programs can be applied to self-development coursework after enrollment or used in career guidance in undergraduate programs.

Limitations

Limitations of this study include the use of narrow convenience sampling and the small number of subjects utilized, reducing the generalizability of our results. In addition, this study was done at one university and may not apply to physical therapy students in other universities. Also, as in any survey research, results may be affected by response bias, acquiescence bias, demand characteristics bias, extreme responding bias, and desirability bias.

Recommendations for Future Research

Future research is needed to examine how grit scores may be used for admissions considerations. Effects of grit on DPT student clinical performance and graduation rates are interesting topics for future research. In our current progressive age of information, traditional paradigms of candidate selection and training are shifting in the medical field.¹² Holistic admissions processes are being considered as a potential method to assess DPT applicants.³⁻⁴ An understanding of this correlation between grit and academic performance will contribute to these endeavors.

Conclusion

Results of this study demonstrate that grit score and grade point average have a significant positive correlation suggesting that students who are grittier are more likely to experience higher academic achievement. Academic success in didactic work translates to successful student clinical rotations and ultimately graduation. Analysis of non-cognitive personality traits like grit can be used to further the development of competent clinicians. Grit score analysis has the potential to be used for graduate school admissions and as a useful tool for student development.

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