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Grit and Optimism Predict Academic Performance in Medical and Health Sciences Students at a Malaysian University: A Cross-Sectional Study

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ABSTRACT

Grit is the perseverance and passion for long-term goals, optimism represents an individual's expectation of a positive outcome in most situations, whereas life satisfaction is a major indicator of well-being. Grit, optimism and life satisfaction play a role in medical and health science education, as they are associated with academic performance. This cross-sectional study explored the relationship between grit, optimism and life satisfaction among medical and health sciences students at a Malaysian university using the 12-Item Grit Scale, Life Orientation Test-Revised (LOT-R) scale and Satisfaction with Life Scale (SWLS). Medical students were significantly grittier than optometry students ($p=0.015$) and significantly more optimistic than biomedical science students ($p=0.007$). Academic performance was significantly correlated with grit ($r=0.135$, $p=0.027$) and optimism ($r=0.139$, $p=0.023$). On the other hand, a significant correlation existed between grit and optimism ($r=0.316$, $p=0.000$) as well as optimism and life satisfaction ($r=0.328$, $p=0.000$), whereas a correlation was observed between grit and life satisfaction ($r=0.171$, $p=0.003$). The findings show that interdisciplinary differences in grit and optimism exist and that grit and optimism are related to the academic performance of medical and health sciences students. Grit, optimism and life satisfaction were interrelated in this study.

Keywords: *Grit, optimism, life satisfaction, medical and health sciences students*

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INTRODUCTION

“Positive psychology”, a term first coined by Martin P. Seligman in 1998, refers to the scientific study of positive human functioning, which encompasses diverse aspects such as the biological, personal, cultural, relational, institutional, and global domains of life (1). On the other hand, the study of medicine and health sciences is generally recognized as arduous and demanding. Medical and health sciences students often encounter an array of challenges in their academic pursuits. Therefore, elements of positive psychology such as grit, optimism and life satisfaction are highly relevant in medical and health sciences education, as they play a vital role in helping students to overcome the hurdles in their studies, particularly in times of adversity.

Grit is a relatively new attribute in the discipline of positive psychology. Duckworth and colleagues define grit as “perseverance and passion for long-term goals” (2). Research has shown that individuals with a high level of grit appear to be better at handling adverse circumstances, maintaining their concentration on long-term goals, and attaining higher levels of success (2, 3). Therefore, when faced with fatigue and frustration, gritty individuals tend to persevere and achieve their goals, whereas non-gritty individuals are more likely to give up on the goals. The 12-item “Grit Scale” developed by Duckworth and colleagues is a common instrument used in grit assessment (2).

Optimism refers to the propensity of an individual to hold positive expectations of the future. In other words, a person who is optimistic is more likely to expect favourable outcomes, whereas a pessimist is one who expects unfavourable outcomes in most circumstances (4). Optimism plays an important role in one’s life because it influences one’s emotional state in times of adversity. For example, an optimist expects good outcomes, even when things appear to be bad. This, in turn, yields relatively positive feelings (5). Moreover, research has shown that one’s coping strategies are greatly influenced by optimism or pessimism. In general, in difficult times optimists are approach copers while pessimists are avoidant copers (6). The Life Orientation Test-Revised (LOT-R) is a widely used instrument to measure an individual’s optimism level (7).

However, studies reported that unrealistic optimism is a widespread human trait, with some individuals exhibiting an optimism bias. They tend to underestimate the probability of adverse events and over-anticipate the probability of positive events (8). This unrealistic optimism was found to have positive impacts on human beings such as reducing fear and anxiety to protect one’s well-being (9), and negative impacts such as unrealistic expectations and over-confidence (10).

Like grit and optimism, life satisfaction is an important element of positive psychology, as being satisfied with one’s life motivates one to pursue and reach one’s goals. One definition of life satisfaction is the “global assessment of a person’s quality of life according to his chosen criteria” (11). It can also be defined as how an individual evaluates their current conditions of life (12). There are three major indicators of well-being, namely life satisfaction, positive affect and negative affect (13). The Satisfaction with Life Scale (SWLS) is commonly used to assess life satisfaction (14).

Relevance Of Grit, Optimism And Life Satisfaction In Medical And Health Sciences Education

Several studies have investigated the relevance of grit in various healthcare professions. In a national survey among general surgery residents, higher grit scores were linked to a lower likelihood of suicidal thoughts, thoughts of attrition and burnout. However, grit was not associated with academic performance (15). Likewise, grit and burnout were inversely related, as observed in another study. Additionally, when there were increased personal and social stressors, increased burnout and decreased grit were seen. Conversely, decreased social and personal stressors were associated with higher levels of grit (16). Brateanu and colleagues, on the other hand, demonstrated that grit was an

independent burnout predictor and that the grit scores and burnout scores were inversely related among internal medicine residents (17).

Alahdab and colleagues reported that grit scores of internal medicine residents at Mayo Clinic were positively correlated with the completion of tasks such as filling in evaluations and attending conferences (18). Grit was also associated with various factors in a study involving undergraduate pharmacy students with regards to the COVID-19 pandemic. Hassan Elnaem and colleagues reported that a higher grit score was observed with pharmacy students who did not face challenges in online learning and in those with excellent academic performance (19). Similarly, higher grit and resilience scores were observed among dental students with higher class ranks and GPA (20). In another study, high grit scores were observed in medical students 1) who completed the medical programme in a shorter duration, 2) with a higher clinical knowledge score and 3) with a higher class rank (21).

Studies have reported that medical and health sciences students have average optimism levels (22, 23). It was also found that medical students with poor performance have lower optimism levels (24). Optimistic students have better academic performance because they are more active, relaxed, and exert more effort in their tasks (25). Studies indicated that optimism acts as one of the coping mechanisms to reduce academic burnout and thus has a positive impact on academic performance (26, 27).

Medical students were reported to experience lower levels of life satisfaction during their studies in medical school (28). On the other hand, health sciences students demonstrated average scores in life satisfaction (22). These results indicated that medical and health sciences students are constantly experiencing academic stresses, heavy workload, and poor student support, leading to academic burnout. One of the adverse effects of academic burnout is decreased life satisfaction that requires effective measures to address the issue (28).

Grit, optimism and life satisfaction are important characteristics for medical and health sciences students to excel in their studies. An understanding of how these characteristics relate to their academic performance provides insights into supporting and improving the success of the students. It also helps educators to design curricula that enhances grit, optimism and life satisfaction among students, which can lead to higher quality medical and health sciences practitioners. The development of grit, optimism and life satisfaction is dependent on different cultural and societal factors. Therefore, an exploration of the interplay of these constructs among Malaysian students from diverse backgrounds is beneficial for nurturing these qualities in them.

Relationship Between Grit, Optimism And Life Satisfaction

Research conducted among 2,000 Mid-Atlantic undergraduate and graduate students in the USA examined the strength of mindset, grit, optimism and pessimism on life satisfaction among both students with self-reported depression and/or anxiety and those without. The study found that grit did not significantly predict life satisfaction among college students, after controlling for the effects of optimism and pessimism. Overall, optimism and pessimism predicted life satisfaction. However, there was a significant difference in the relative contribution of optimism and pessimism based on self-reported depression or anxiety. Moreover, college students with depression and/or anxiety also exhibited significantly more fixed mindsets, higher levels of pessimism and lower levels of grit, life satisfaction and optimism (29).

Oriol and colleagues conducted three studies among secondary and university students to explore the relationship between life satisfaction and optimism. In the first study, grit was observed to mediate this relationship among secondary students. In the second study, a positive affect was observed to

mediate this relationship among university students. In the third study, meaning of life and gratitude mediated this relationship. Taken together, the findings from the studies suggest a strong relationship between optimism and life satisfaction, mediated by several factors such as grit, positive affect, meaning of life and gratitude (30).

Among the numerous studies conducted on grit among university students, a significant proportion have primarily focussed on exploring the associations between grit and either academic performance or burnout. Conversely, not many studies have investigated the interdisciplinary differences in grit among medical and health sciences students. There is also limited research on the interrelations between grit, optimism and life satisfaction in the context of medical and health sciences education. To address this knowledge gap, the present study aimed at examining the interdisciplinary differences in grit and the relationships between these three constructs of positive psychology.

METHODS

This was a cross-sectional study carried out at a private university in Malaysia on the relationship between grit, optimism and life satisfaction among medical and health sciences.

Participants

The study was conducted on a total of 296 Year 1 and Year 2 medical and health science undergraduate students from four programmes, which are Medicine ($n=111$), Dentistry ($n=101$), Optometry ($n=86$), and Biomedical Science ($n=45$) (Table 1).

Table 1: Summary of instruments used in this study.

Instrument	No. of items	Likert scale	Scoring and interpretation	Reference
12-Item Grit Scale	12	5-point Likert scale <ul style="list-style-type: none"> • 5=Very much like me • 1=Not like me at all (6 reverse code items)	<ul style="list-style-type: none"> • Final score= Sum of scores of all items /12 • Final score: Ranged from 1 to 5 • Final core interpretation: <ul style="list-style-type: none"> ➤ 1: Not at all gritty ➤ 5: Extremely gritty 	[2]
Life Orientation Test-Revised (LOT-R)	10	5-point Likert scale <ul style="list-style-type: none"> • 0=Strongly disagree • 4=Strongly agree (3 reverse code items and 4 filler items)	<ul style="list-style-type: none"> • Total score: Ranged from 0 to 24 (4 filler items). • Total score interpretation: <ul style="list-style-type: none"> ➤ 0 -13: Low optimism ➤ 14 -18: Moderate optimism ➤ 19-24: High optimism. 	[7]
Satisfaction with Life Scale (SWLS)	5	7-point Likert scale <ul style="list-style-type: none"> • 1= Strongly disagree • 7=Strongly agree 	<ul style="list-style-type: none"> • Total score= Sum of scores of all items. • Total score: Ranged from 5 to 35. • Total score interpretation: <ul style="list-style-type: none"> ➤ 5 -9:Extremely 	[11]

-
- dissatisfied
 - 10-14: Dissatisfied
 - 15-19: Slightly dissatisfied
 - 20: Neutral
 - 21-25: Slightly satisfied
 - 26-30: Satisfied
 - 30-35: Extremely satisfied
-

Instruments

Three questionnaires, which have been widely used in the public literature, were used in this study, namely, the 12-Item Grit Scale, the Life Orientation Test-Revised (LOT-R) and the Satisfaction with Life Scale (SWLS). All three instruments are reliable and offer robust measures of the psychological constructs in this study with strong validity evidence (31-33). Table 1 summarises the instruments used in this study. The students filled in their demographic data prior to attempting these three questionnaires. In the demographic data section of the questionnaire, the students were also asked to provide their grade point average (GPA) for the most recent semester up to the point when they attempted the survey.

Statistical analysis

Statistical analysis was performed using the Statistical Product and Service Solutions (SPSS) software version 22. The grit, optimism and satisfaction with life scores were expressed as mean \pm standard deviation. Interdisciplinary differences in mean grit, optimism and life satisfaction scores were analysed using Analysis of Variance (ANOVA). Pearson correlation was used to determine the effect of grit, optimism and life satisfaction on academic performance, as well as the interrelationships between grit and optimism, and optimism and life satisfaction. A p value of ≤ 0.05 was considered significant and ≤ 0.001 , highly significant.

RESULTS

Response rate and demographic data

The questionnaire was distributed to a total of 338 Year 1 and Year 2 undergraduate medical and health sciences students. Two hundred and ninety-six medical and health sciences students took part in this study with an overall response rate of 87.5%. The minimum age of the students was 18 and the maximum, 34. The mean age was 20.92 (± 1.96). Other demographic data of the participants is summarised in Table 2.

Table 2: Demographic data of the participants.

Variable	Frequency	%
Program	Medicine	34.8
	Dentistry	29.4
	Optometry	22.6
	Biomedical science	13.2

Gender	Male	97	32.8
	Female	199	67.2
Nationality	Malaysian	216	73.0
	International	80	27.0
Race	Malay	33	11.2
	Indian	42	14.3
	Chinese	142	48.3
	Others	79	26.2

Mean grit, optimism and life satisfaction scores among medical and health sciences students

The mean grit, optimism and life satisfaction scores of medical and health sciences students are summarised in Figure 1(A-C). Data in this study was normally distributed. Therefore, parametric tests were applied. Biomedical science students had the highest grit score (3.39 ± 0.60). This was followed in decreasing order by medical (3.37 ± 0.51), dental (3.22 ± 0.39) and optometry students (3.14 ± 0.53). The overall mean grit score of all students was $3.28 (\pm 0.50)$. Medical students scored the highest in the mean LOT-R score (14.54 ± 4.00). This was followed by dental students (13.43 ± 2.43) and optometry students (13.36 ± 2.66), respectively. Biomedical science students scored the lowest in the mean LOT-R score (12.54 ± 3.55). The overall mean LOT-R score was $13.68 (\pm 3.31)$. On the other hand, in decreasing order, the mean SWLS scores of medical, optometry, dental and biomedical students were $23.27 (\pm 6.30)$, $22.32 (\pm 5.23)$ and $21.21 (\pm 5.50)$, respectively. The overall mean SWLS score was $22.55 (\pm 5.74)$.

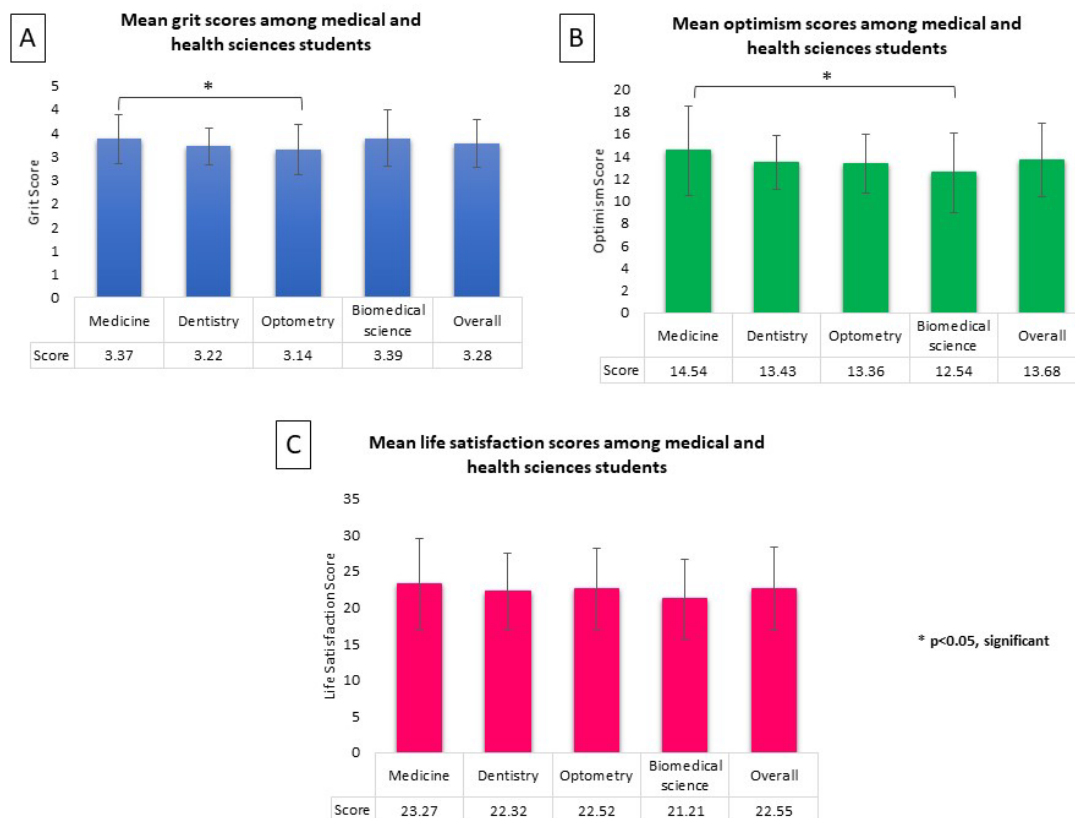


Figure 1 Interdisciplinary differences in grit, optimism and life satisfaction among medical and health sciences students

Figure 1: Interdisciplinary differences in grit, optimism and life satisfaction among medical and health sciences students.

Interdisciplinary differences in grit, optimism and life satisfaction

Analysis of Variance (ANOVA) showed a statistically significant difference ($p = 0.006$) when comparing the mean grit scores of medical, dental, optometry and biomedical science students for the 12-Item Grit Scale, as well as the mean LOT-R scores ($p=0.005$). However, the ANOVA for interdisciplinary differences in mean SWLS score was not statistically significant ($p=0.272$). Post-hoc analysis showed that medical students (3.37 ± 0.51) scored significantly higher in grit than optometry students (3.14 ± 0.53 ; $p=0.015$). The medical students (14.54 ± 4.00) also scored significantly higher in optimism than biomedical science students (13.36 ± 2.66 ; $p=0.007$). All other pairwise comparisons were statistically not significant.

Relationship between academic achievement and grit, optimism and life satisfaction

Academic performance of medical and health sciences students was determined using the Grade Point Average (GPA). There was a weak, positive correlation between academic performance (3.28 ± 0.55) and grit (3.28 ± 0.50 , $r=0.135$, $p=0.027$), as well as a weak, positive correlation between academic performance (3.28 ± 0.55) and optimism (13.68 ± 3.31 ; $r=0.139$, $p=0.023$). However, there was no

significant correlation between academic performance (3.2766 ± 0.55) and life satisfaction (22.55 ± 5.74 ; $r=0.107$, $p=0.081$). The results are summarised in Table 3.

Table 3: Correlation between academic achievement and grit, optimism and life satisfaction.

Variable	<i>M</i>	<i>SD</i>	<i>r</i>	<i>p</i>
Grit	3.25	0.50	0.135*	0.027
Optimism	13.68	3.31	0.139*	0.023
Life Satisfaction	22.55	5.74	0.107	0.081

*Significant correlation, $p < 0.05$

Interrelations between grit, optimism and life satisfaction

The interrelations between grit, optimism and life satisfaction are summarised in Table 4. A moderate, positive and significant correlation was observed between grit (3.28 ± 0.50) and optimism (13.68 ± 3.31 ; $r=0.316$, $p=0.000$). There was also a weak, positive and significant correlation between grit (3.28 ± 0.50) and life satisfaction (22.55 ± 5.74 ; $r=0.171$, $p=0.003$). On the other hand, optimism was found to be moderately, positively and significantly correlated with life satisfaction (22.55 ± 5.74 ; $r=0.328$, $p=0.000$) among medical and health sciences students.

Table 4: Correlation between grit, optimism and life satisfaction.

Variable	<i>M</i>	<i>SD</i>	1	2
1. Grit	3.25	0.50		
2. Optimism	13.68	3.31	0.316**	
3. Life satisfaction	22.55	5.74	0.171**	0.328**

** Significant correction, $p < 0.01$

DISCUSSION

The pursuit of medicine and health sciences is challenging and requires perseverance and diligent efforts. Therefore, positive psychology plays an important role in medical and health sciences education due to its potential to improve resilience, well-being and academic performance. Studies have shown that grit, optimism and life satisfaction are three interrelated constructs of positive psychology, which can significantly influence the academic success of medical and health sciences students (19-21, 34, 35).

Interdisciplinary differences in grit and optimism

The present study observed an interdisciplinary difference in grit levels between medical and optometry students, with the former scoring significantly higher. This finding is in line with a previous study that reported interdisciplinary differences between engineering students from the

United States with different specializations (36). However, another study reported no significant interdisciplinary differences among students at different departments of the faculty of education in a Turkish university (37). These contradictory results may be due to cultural factors that influence the perception of grit (38). The demanding nature of the medical curriculum may help explain why medical students scored significantly higher in grit than optometry students in the present study, as being gritty helps in overcoming challenges and maintaining the persistent interest and efforts required of the medical programme. One potential benefit of having gritty medical students is that, according to research, grit protects medical students against burnout. Therefore, grit may be used as a predictive factor for burnout among medical students, which warrants further exploration (39).

Similarly, an interdisciplinary difference was observed for optimism, whereby medical students scored significantly higher than biomedical students. This finding is in tandem with that of a previous study by Mahasneh and colleagues, who reported that optimism and pessimism were affected by the nature of academic specialization (40). Being optimistic is important and beneficial in medical education, as medical students face many training-specific stressors such as dissecting cadavers and interacting with chronically ill and dying patients (41, 42). Therefore, a higher level of optimism is expected of medical students along the learning path of their academic specialization, which may help explain the interdisciplinary difference in optimism observed in the present study. The higher optimism among medical students can have positive implications. In general, optimism has been reported to be linked to better mental health, reduced stress and depression (43).

Academic performance correlated with grit and optimism but not life satisfaction

The present study demonstrated a weak, positive and significant correlation between academic performance (in terms of GPA) with grit and optimism, respectively. However, academic achievement did not correlate with life satisfaction. This finding is in tandem with many previous studies, which showed a positive relationship between grit and academic achievement among medical and health sciences students. For example, Pate and colleagues reported that the total grit score was a significant predictor for pharmacy students with grade point average (GPA) ≥ 3.5 (35). Medical students with a higher grit score were more likely to persevere, show better academic performance and graduate in a shorter time (21). In addition, medical students who repeated >1 year were reported to have lower grit scores than non-repeaters (34), whereas higher grit scores were associated with better academic performance and higher class ranks among dental students (20).

The correlation between academic performance and optimism coincides with findings of previous research among students from diverse educational levels and institutions, which demonstrated a clear association between optimism and academic performance (44-46). Interestingly, Ickson and colleagues demonstrated that high optimism did not always translate to high academic performance. Individuals with high optimism but who possessed low conscientiousness experienced adverse effects on academic performance due to over-confidence and unrealistic expectations. Conversely, high levels of conscientiousness facilitated the moderation of the adverse effects of high optimism (10). Moreover, another study showed that the relationship between optimism and academic performance was mediated by the meaning of education (47).

No significant correlation between academic performance and life satisfaction was observed among the medical and health sciences students in this study. This contradicts a previous longitudinal study in Hong Kong that showed that school performance was negatively and significantly related to life satisfaction (48). The observed difference may be due to the cross-sectional design of this study, which did not allow the exploration of the influence of academic performance on life satisfaction over time. Findings from another study also suggested that students with high life satisfaction were at an academic advantage in terms of greater engagement, increased academic self-efficacy, decreased academic stress, greater approach-oriented academic goals, and higher GPA (49).

Collectively, these findings suggest that there are some performance advantages for grit and optimism. Although the natural human response to negative events is passivity, grit and optimism may encourage a shift of the response towards strength, growth and improved performance. Loftus and colleagues suggest that some strategies to cultivate these advantages of grit and optimism include maintaining a positive mindset, engaging in major challenges that match one's skill set, emphasizing deliberate practice to improve skills, persistently working hard and identifying higher purpose and meaning in life and work (50).

Grit, optimism and life satisfaction interrelated

The present study revealed that grit, optimism and life satisfaction were interrelated. A positive and significant correlation was observed between 1) grit and optimism, 2) grit and life satisfaction and 3) optimism and life satisfaction. The relationship of grit and optimism has been reported in several previous studies. For example, research has shown a positive correlation between grit and the growth mindset (51). A growth mindset is inherently optimistic, as it refers to the expectancy of an individual for a "good thing" to happen after prolonged effort. It was shown to be unlikely for individuals to persist in challenging tasks without expectancy for positive results (29).

A positive and significant correlation existed between grit and life satisfaction among medical and health sciences students in this study, which aligns with findings of previous studies. Khan and Khan illustrated a moderate positive correlation between grit and life satisfaction among 100 professionals including doctors, teachers, lawyers, engineers and bankers (52). On the other hand, studies have reported that the relationship between grit and life satisfaction is mediated by self-esteem (53), depression (54) and hope (55), and is moderated by stressful life events (54).

Similarly, a positive and significant relationship between life satisfaction and optimism among medical and health sciences students was seen in this study. The relationship between life satisfaction and optimism has been demonstrated in one previous study, which reported a significant correlation between optimism and life satisfaction, mediated by goal orientation. The findings of the study suggest that it is important to promote adaptive behaviours related to goal orientation among students, as it can lead to enhanced levels of life satisfaction and optimism, as well as improved academic performance (56).

Positive psychology, such as resilience and goal orientation, provides tools and strategies to cultivate grit, optimism and overall life satisfaction within individuals. For example, gritty individuals were found to be more resilient because they are able to maintain their goals and motivation despite obstacles. One study reported that the effort component and interest component of grit were significantly associated with resilience among nursing students (57). Resilient individuals are more likely to be optimistic because they are more inclined to believe in their ability to surmount challenges and attain their objectives. This observation was demonstrated among university students during the unprecedented COVID-19 pandemic, as a strong positive relationship between optimism and resilience was reported in the study (58). Another study revealed that goal orientation plays a positive mediating role in the relationship between optimism and life satisfaction (56). Optimistic individuals are ambitious in setting and pursuing challenging goals. When the individuals successfully pursue and achieve their goals, they experience a sense of satisfaction in their lives.

The findings on the relationship between grit, optimism and life satisfaction go beyond just simply identifying the correlations. The significance of these findings lies in the interconnectedness between the variables. This means that fostering one quality (e.g. optimism) may influence the others (e.g. grit and life satisfaction). A deeper understanding of the interconnectedness of these variables could be helpful in fostering a holistic approach in medical and health sciences education. On the other hand,

strategies to cultivate grit and optimism could contribute to enhanced academic performance and well-being, which ultimately lead to successful careers in the healthcare field.

LIMITATIONS OF THE STUDY

This study was limited to only Year 1 and Year 2 medical and health sciences students who were recruited from a single institution. The study was also limited by a small sample size. It is noteworthy that several potential confounding factors such as gender and prior knowledge could influence the relationships between grit, optimism and life satisfaction among medical and health sciences students. The control of these variables was limited by the cross-sectional design of the study. Nevertheless, the findings of this study provide initial exploration for the interplay between grit, optimism and life satisfaction.

FUTURE RECOMMENDATIONS

To expand the current knowledge of the relationships between grit, optimism and life satisfaction in the context of medical and health sciences education, future studies should consider incorporating a longitudinal perspective. Specifically, it would be beneficial to follow students throughout their entire academic programme, from the first year to the final year. This would allow observation of potential variations in the students' levels of grit, optimism and life satisfaction. In addition, future studies should also control for confounding factors such as gender, prior knowledge and socioeconomic background. A comparative approach that includes both health sciences and non-health sciences students, as well as students from different institutions, would further enhance the understanding of interdisciplinary differences in these three constructs. Exploration of the mediating and moderating factors would give new insights into the complex interplay between grit, optimism and life satisfaction in medical and health sciences education.

CONCLUSIONS

The findings of this study provide a valuable contribution to the understanding of the interplay between grit, optimism and life satisfaction in the context of undergraduate medical and health sciences education at a Malaysian university. There are three key findings of this study. First, the study revealed significant interdisciplinary differences in grit and optimism. Secondly, the study showed that academic performance correlated positively and significantly with grit and optimism but displayed no such association with life satisfaction. This key finding highlights the potential of grit and optimism as factors that influence student success. In addition, grit, optimism and life satisfaction were shown to be interrelated. Taken collectively, the results suggest that grit and optimism play a role in academic success and are closely linked to overall life satisfaction. Researchers could conduct longitudinal studies and studies on diverse institutions and programmes to explore the applicability of these findings in broader contexts.

For educators and stakeholders, the findings of this study imply that the implementation of learning strategies and academic support aimed at enhancing the students' grit and optimism may have a positive impact on their overall academic experience and subsequently life satisfaction. The positive correlation between grit, optimism and life satisfaction strengthens the theoretical understanding of the interconnectedness of these variables. Medical and health sciences educators may consider developing learning environments that promote grit, tenacity and perseverance and provide targeted interventions. For example, positive psychology intervention programmes directed at fostering grit

and perseverance may potentially result in higher levels of optimism and life satisfaction, consequently leading to enhanced academic performance. In terms of contribution to policy, these findings support the incorporation of courses that promote grit and optimism in the curriculum, as well as developing student supports that focus on positive thinking and resilience. Collectively, these strategies could result in a more holistic approach to student success.

ETHICAL APPROVAL

The proposal for this project underwent approval from the Proposal Defence Committee of the university. The committee was of the opinion that the proposed research complied with the core principles of ethical research conduct.

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