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# Nursing Students' Grit and Psychological Capital After Crises: A Repeated Cross-Sectional Study

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## ABSTRACT

**Background:** Grit is characterized by perseverance and consistency of interest; among nursing students, grit is a predictor of academic and professional success. This study examined the predictive factors of grit among nursing students 2 years after the coronavirus disease 2019 (COVID-19) pandemic. **Method:** Using a repeated cross-sectional design, baccalaureate nursing students at an Australian university were invited to complete an online questionnaire. Data were analyzed using SPSS structural equation modeling. The study adhered to Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. **Results:** Among students, grit remained stable over time. Conscientiousness emerged as a significant predictor of perseverance of effort and consistency of interest, while agreeableness influenced perseverance of effort after crises. **Conclusion:** A complex interplay of personality traits, psychological factors, and environmental influences shape grit among nursing students. Developing crucial determinants of grit, such as self-efficacy and hope, vitally empowers nursing students to face large-scale or personal crises.

**G**rit, a psychological trait characterized by passion and perseverance toward goals that are long-term, recently has emerged as a focal point in academic research and practical application. Coined by Duckworth et al. (2007), grit encapsulates the sustained effort and resilience required to navigate challenges and setbacks on the journey toward achievement. At its core, grit represents the convergence of

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two essential elements, which encompass perseverance of effort and consistency of interest (Duckworth & Quinn, 2009). Consistency of interest is the unwavering commitment and passion toward a specific goal or pursuit, fueling sustained engagement and motivation over time (Duckworth & Quinn, 2009). This aspect of grit encompasses a deep-seated sense of purpose and direction, driving individuals to remain focused and dedicated amidst distractions and obstacles. In addition, perseverance of effort, the second essential element of grit, represents the resilience and determination to persist in adversity (Duckworth & Quinn, 2009). Together, these two components form the foundation of grit, enabling individuals to navigate the complexities of pursuing long-term goals with tenacity and resilience, even when confronted with challenges, setbacks, or failures.

Myriad cognitive and noncognitive factors and environmental factors affect grit (Duckworth et al., 2007). Correlations between grit have been identified with traits such as conscientiousness, agreeableness, and self-efficacy, highlighting the multifaceted nature of this construct (Duckworth, 2016; Duckworth & Quinn, 2009; Duckworth et al., 2011; Terry et al., 2023). Those with high grit levels tend to demonstrate extraordinary perseverance, resilience, and self-regulation in the face of challenges, leading to enhanced performance and achievement across various domains (DeWitz et al., 2009; Duckworth et al., 2011; Huéscar Hernández et al., 2020). Moreover, recent studies have highlighted the significance of grit in predicting academic and professional success, particularly among populations that may encounter unique challenges, such as students and health care professionals (Terry & Peck, 2020a).

The developmental pathways of grit are complex and dynamic, shaped by many factors, including individual experiences, personal characteristics, and environmental influences (Duckworth, 2016; Duckworth & Quinn, 2009). While certain traits, such as conscientiousness, may exhibit relative stability over time, other traits, such as self-efficacy and locus of control, offer opportunities for intervention and growth (Ghanizadeh, 2022). Exposure to challenges and setbacks can serve as catalysts for developing grit, particularly when accompanied by adequate support and encouragement (Biangone et al., 2025; Duckworth & Quinn, 2009; Terry & Peck, 2020b). Research has shown that individuals challenged to overcome obstacles tend to develop greater resilience and perseverance, leading to increased grit over time (Duckworth & Quinn, 2009; Huéscar Hernández et al., 2020).

Grit represents a fundamental aspect of human behavior that transcends talent or intelligence in predicting success and resilience (Duckworth et al., 2007). By understanding its components, predictors, and developmental pathways, researchers and practitioners can design interventions aimed at fostering more significant levels of grit among individuals, particularly in the face of adversity (Duckworth, 2016; Rammstedt et al., 2022; Terry et al., 2024). Moving forward, further research is needed to explore the dynamic nature of grit and its implications for personal development and academic success. As we continue to unravel the complexities of grit, we stand to gain valuable insights into human motivation, resilience, and achievement, ultimately paving the way for enhanced well-being and success in individuals and communities alike.

Building on the previous work of Terry et al. (2024), the aim of this study was to further examine the predictive factors affecting consistency of interest and perseverance of effort—critical elements of grit—amongst nursing students 2 years after the shared crisis of the global pandemic caused by coronavirus disease 2019 (COVID-19) (Rammstedt et al., 2022). In addition, the study sought to examine how indirect and direct predictors of grit, such as personality, self-efficacy, locus of control, and psychological capital, may have changed since the initial study (Terry & Peck, 2020b). Therefore, the hypothesis is that predictor variables affecting perseverance of effort and consistency of interest would be altered compared with measures before, at the time of, and after a major crisis event.

## METHOD

To investigate both the direct and indirect factors influencing resilience in nursing students 2 years after the global COVID-19 pandemic, a cross-sectional methodology was used to gather data among nursing students at an Australian university, as described in Terry et al. (2024). The methods of reporting followed Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. These guidelines ensure the study reports the research transparently and comprehensively to demonstrate the strengths and weaknesses of the research accurately while maintaining the quality and reliability of the findings within the study (Cuschieri, 2019).

### Sample

Nursing students enrolled in a baccalaureate nursing program in 2022 were invited to participate in an anonymous online questionnaire that was part of a broader repeated cross-sectional study using Qualtrics® software. The invitation was extended to all of the students ( $n = 1,876$ ) who were enrolled in the nursing program at the time the study was conducted.

### Instrument

The questionnaire incorporated standard demographic questions, such as age, gender, birth year, and birth country. In addition, previously validated scale items were included

and encompassed the Grit-Short scale (Grit-S), Big Five Inventory extra-short scale (BFI-2XS), Internal-External Locus of Control-4 scale (IE-4), General Self-Efficacy scale (GSE-10), and the Psychological Capital Questionnaire (PCQ-12) (Table 1).

### Data Collection

Data collection took place during the 2022 mid-year break (May to June). The administrative team played a crucial role in disseminating the questionnaire via email, which helped maintain confidentiality and minimize any potential or perceived coercion on students by the research team, who were academics in the nursing program. The email invitation contained a link to the student participation information page where students provided informed consent and accessed the questionnaire. To ensure an adequate sample size ( $n \geq 201$ ) that would meet a 95% CI (MOE  $\pm 6\%$ ), reminder emails were sent in the first, second, and fourth weeks following the initial invitation. Completion of the online questionnaire was estimated to take approximately 15 to 25 minutes.

### Data Analysis

Data analysis was conducted using SPSS® (Version 25.0). Simultaneously, the hypothesis was tested through Structural Equation Modelling (SEM) with SPSS AMOS (Version 27.0). The chi-square to degree of freedom ratio (CMIN/DF) was used to determine the fit between the sample data and the hypothetical model, with values  $\leq 3$  indicating an acceptable fit and values  $\leq 5$  indicating a reasonable fit. Additionally, the comparative fit index (CFI) was calculated to ascertain differences between the data and the hypothesized model, with scores from 0 to 1, and values that near 1 indicate an excellent fit. The root-mean-square error of approximation (RMSEA) was used to assess the difference between the hypothesized model and the actual population; values  $\leq .05$  were regarded as excellent, with the overall significance determined using a two-tailed test at  $p \leq .05$  (Kline, 2023).

## ETHICAL CONSIDERATION

Ethical clearance for the study was obtained from the Federation University Human Research Ethics Committee (Approval #18-017). The research strictly followed the ethical principles for medical research involving human subjects as outlined in the Declaration of Helsinki and all procedures were conducted in compliance with the relevant guidelines and regulations. Informed consent was obtained from each participant before data collection began.

## RESULTS

A total of 201 (10.71%) students completed the questionnaire. Among those who participated, there were more second-year students (43.28%) than first- and third-year students. In addition, as anticipated, given the program of study, there was a higher proportion of women (89.55%) be-

tween the ages of 20 and 39 years (58.71%) who were born in Australia (70.65%) (Table 2).

Mean scores were 3.75 for the Grit-S, 18.55 for the PCQ-12, and 32.15 for the GSE-10. There were no significant differences in students' study year, gender, birthplace, and age group among the Grit-S, PCQ-12, and GSE-10. However, grit was significantly higher among students ages 30 to 39 years (3.93) compared with students who were  $\leq 20$  years (3.57),  $F(4, 197) = 3.472, p = .01$ .

### Predictors of Grit

The 2022 data were analyzed to identify indirect and direct predictors of grit using SEM, which showed a good model fit ( $\chi^2 = 26.726$ ;  $CMIN/DF = 6.682$ ;  $p = .001$ ;  $CFI = 0.887$ ;  $RMSEA = 0.164$ ). The model indicated an increase of one standard deviation in conscientiousness led to a 0.37 increase in the consistency of interest standard deviation, followed by agreeableness (.20) also being a direct predictor of consistency of interest ( $R = 28.4\%$ ). Additionally, a rise in agreeableness by one standard deviation was associated with a 0.37 increase in perseverance of effort standard deviation, followed by conscientiousness (.32), resilience (.13), and general self-efficacy (GSE) (.03) being direct predictors of perseverance of effort ( $R = 41.6\%$ ) (Figure 1 and Table 3).

## DISCUSSION

This study shows grit remains stable 2 years after a crisis, despite additional global issues such as war, inflation, and cost of living crises, suggesting grit initially declines but stabilizes as individuals adapt and develop coping mechanisms. Given the crises in 2022, events such as war were more removed from students' daily activities, and inflation and cost of living had not significantly affected all students until late in the year. Despite these challenges, psychological capital scores in 2022 remained unchanged, supporting the notion psychological capital remains stable (Terry & Peck, 2020b).

Conscientiousness, linked to self-regulation and goal achievement, was identified as the strongest predictor of both perseverance of effort and consistency of interest. Duckworth and Quinn (2009) stated these traits show high positive correlations with conscientiousness across age groups. Credé et al. (2017) suggested grit may be a facet of conscientiousness due to their overlap. However, during the COVID-19 pandemic, conscientiousness no longer predicted consistency of interest or perseverance of effort. This led to the hypothesis that higher levels of conscientiousness would reemerge as key predictors of these traits after the pandemic. The latest findings support this

**TABLE 1**  
Scales Used in the Study

Scale	How Measured	Reliability ( $\alpha$ )	Reference
Grit-S	8 items, 5-point Likert scale	0.755	Duckworth et al. (2007)
BFI-2XS	15 items, 5-point Likert scale	0.690 to 0.800	Soto & John (2017)
IE-4	4 items, 5-point Likert scale	0.653	Klaus et al. (2020); Kovaleva (2012)
GSE-10	10 items, 5-point Likert scale	0.790 to 0.900	Schwarzer & Jerusalem (2010)
PCQ-12	4 attributes (efficacy, hope, optimism, resilience), 6-point Likert scale	Efficacy: 0.836; hope: 0.963; optimism: 0.820; resilience: 0.649	Luthans et al. (2004, 2007)

Note. Grit-S = Grit-Short scale; BFI-2XS = Big Five Inventory extra-short scale; IE-4 = Internal-External Locus of Control-4 scale; GSE-10 = General Self-Efficacy scale; PCQ-12 = Psychological Capital Questionnaire.

hypothesis, reinforcing the idea that conscientiousness remains a dominant factor in predicting perseverance and consistency of interest (Terry & Peck, 2020b).

Agreeableness was a significant positive predictor of both consistency of interest and perseverance of effort. This trait, characterized by a cooperative attitude, trust in others, and a desire to maintain relationships through compassion and generosity, enhances levels of perseverance and effort. Rammstedt et al. (2022) noted higher agreeableness significantly influenced individual responses to trust, adaptation, and compliance with directives during COVID-19. Agreeableness, highly valued among nurses and nursing students, is linked to increased personal accountability (Drach-Zahavy & Srulovici, 2019). However, during the pandemic, agreeableness did not serve as a predictor, likely due to the stability in students' activities and established relationships. Postpandemic, as restrictions were lifted, the need to reinvest in relationships led to agreeableness reemerging as a crucial determinant. This resurgence highlights the importance of trust, adaptability, and compliance with directives in fostering grit (Neuwirth et al., 2021).

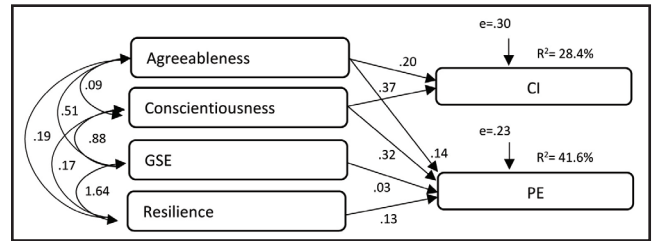
Psychological capital was examined as a beneficial resource that can steer outcomes and goal achievement, facilitating the cultivation of grit. Previous models between 2019 and 2021 identified hope, optimism, and efficacy as attributes of psychological capital; however, these were considered unremarkable during the pandemic (Terry & Peck, 2020b). Action-embedded hope was present before and during COVID-19, giving way to essential hope postpandemic; yet, by 2022, hope had disappeared as a critical driver of grit, as COVID-19 became normalized within the community. The need for essential hope diminished, and action-embedded hope was unnecessary, and thus not present in the 2022 model (Terry & Peck, 2020b).

Only resilience, one of the four psychological capital attributes, was identified as a predictor of perseverance of effort in 2022. Resilience is the capacity to rebound from adversity, conflict, and failure, and involves proactive growth and learning by tackling challenges (Youssef & Luthans, 2007). The study demonstrated resilience was absent in pre-

**TABLE 2**  
Participant Demographics (N = 201)

Demographics		
Year of program	n	%
First year	40	19.90
Second year	87	43.28
Third year	66	32.84
Missing	8	3.98
Gender		
Men	12	5.97
Women	180	89.55
Gender not indicated	1	0.50
Missing data	8	3.98
Age (years)		
≤20	20	9.95
20 to 29	57	28.36
3 to 39	61	30.35
≥40	55	27.36
Missing	8	3.98
Born in Australia		
Yes	142	70.65
No	51	25.37
Missing data	8	3.98
Predictor Variables		
	Mean (SD)	Range
Grit		
Consistency of interest	3.56 (0.64)	1.50–5.00
Perseverance of effort	3.93 (0.63)	2.25–5.00
Total grit	3.75 (0.55)	2.33–5.00
Psychological capital		
Total psychological capital	18.55 (3.40)	4.67–24.00
General self-efficacy		
Mean general self-efficacy	32.15 (4.09)	20.00–40.00
Locus of control scores		
Mean locus of control	3.75 (0.63)	2.00–5.00

vious models, suggesting students may not have needed or developed the need to bounce back before COVID-19. During 2020 and 2021, students were actively traversing the adversity caused by the pandemic (Terry & Peck, 2020b). The assumption is that significant adversity leads to increased hardiness, performance, and well-being. Observing resilience in 2022 indicates students' ability to respond and adapt to new situations, driving perseverance of effort. Despite resilience increasing over one's lifetime and being contextual, without additional training and support, resilience observed



**Figure 1.** Path model of the study. Agreeableness and Conscientiousness form part of the Big Five personality traits, while the General Self-Efficacy (GSE) scale is another measure. Resilience is recognized as an attribute of Psychological Capital. In the context of grit, CI stands for the consistency of interest, and PE denotes the perseverance of effort. The numbers succeeding the straight arrows in the model signify the standardized direct effects of all variables, and the double-headed arrows indicate the covariances among various variables. The symbol “e” represents the estimated error, and “R” signifies the variance level or the percentage that the predictors of the factors in the model account for.

in 2022 may wane or diminish among students over time as a function of the development and interaction with the environment in which the individuals are situated (Seery et al., 2010; Southwick et al., 2014).

GSE significantly affects perseverance of effort by embodying the self-confidence and motivation needed to tackle complex tasks, overcome obstacles, and achieve desired outcomes. According to Bandura (1994), GSE acts as a mediator of action and behavior, where belief in one's abilities leads to significant performance levels that affect individual lives. GSE was a predictor of both consistency of interest and perseverance of effort in 2019 and has reemerged as a crucial factor for perseverance of effort in the 2022 model highlighting the importance of self-efficacy in maintaining perseverance, especially in the context of long-term goals (Terry & Peck, 2020b).

During a major crisis, GSE did not predict grit; however, the more sensitive efficacy measure of psychological capital better captured self-efficacy. This reflects students' beliefs in their ability to succeed, which can fluctuate in times of crisis (Park & Avery, 2019). Bandura et al. (2006) noted self-efficacy is situation-specific, which indicates why GSE reappears as a predictor of perseverance of effort after a significant crisis rather than during or immediately after. During COVID-19, students may have struggled due to a lack of necessary knowledge, information, or experience, leading to a gap between their understanding and ability to act. Motivation and self-belief are crucial for achieving desired outcomes or coping with challenges, but these often are hindered during a crisis (Park & Avery, 2019). However, in 2022, with increased knowledge, understanding, and experience, self-efficacy emerged as a predictor of perseverance of effort for students' long-term goals (Terry & Peck, 2020b). Building on the understanding that grit remains stable 2 years after a crisis and the importance of psychological capital, it is essential to explore how these concepts can be practically applied in nursing education.

### Implications for Practice

Given the numerous challenges nursing students face, including high levels of stress, demanding coursework, and the

**TABLE 3**  
**Factors That Affect the Grittiness of Nursing Students (N = 201)**

Year	Factor	R <sup>2</sup>	Predictor	Standardized Beta	SE	p
2022	Consistency of interest	.284	Agreeableness	.197	.068	.004*
			Conscientiousness	.374	.453	.001**
2022	Perseverance of effort	.416	Agreeableness	.136	.060	.023*
			Conscientiousness	.316	.053	.001**
			General self-efficacy	.131	.046	.004*
			Resilience	.034	.011	.002*

emotional toll of clinical practice, it is vital to assist students in navigating these challenges and developing the resilience needed for their future careers (Shen et al., 2024). As such, it is essential to develop and integrate specific learning opportunities or modules into nursing curriculum that focus on fostering resilience, perseverance, and stress management (Aryuwat et al., 2024). This approach will not only foster grit among nursing students but will also significantly enhance their ability to bounce back from adversity, improve academic success, reduce student attrition, and maintain a positive outlook (Terry & Peck, 2020a; Terry & Peck, 2020b).

Specific concepts to be added to curricula include resilience, perseverance, growth mind-set, and stress management training. Additionally, it is important to include crisis management and adaptation, which involves developing strategies for managing and adapting to crises with a focus on psychological resilience and coping mechanisms. Expanding on psychological capital development by enhancing attributes such as hope, optimism, efficacy, and resilience in students also is crucial. Discussing and nurturing personality traits such as conscientiousness and agreeableness in crisis situations can further support students.

The integration of key modules into the existing nursing curriculum should be carefully planned and may be embedded into the first and second years of a nursing program to ensure that students develop these essential skills early in their education. This integration should align with current courses, complementing existing content and ensuring a holistic approach to nursing education.

Training and modules encompassing the development of resilience should include topics such as stress management techniques, cognitive-behavioral strategies, and mindfulness practices. Teaching approaches or learning modules that include interactive workshops, role-playing exercises, and reflective journaling may assist students internalize these concepts. Further, assessments may include reflective journals and group discussions to demonstrate students' understanding and application of resilience strategies (Shen et al., 2024).

Assisting students to develop perseverance is equally important, where training should focus on cultivating a growth mind-set and sustained effort in the face of challenges. Key modules may include case studies on overcoming challenges, group projects requiring sustained effort, and goal-setting exercises (Smith & Yang, 2017). Collaborative projects, case

study analyses, and goal-setting workshops can be effective teaching approaches (Ozsaban et al., 2019).

Stress management modules should focus on equipping students with techniques and the capacity to manage stress effectively (Reyes et al., 2015). For example, these may involve stress reduction skills, time management practices, and relaxation exercises. Workshops, practical exercises, and guided relaxation sessions may be used as teaching methods (Kim & Chang, 2022). Overall, these approaches highlight the importance of integrating resilience, perseverance, and stress management modules into the nursing curriculum to foster grit.

Suggested modules, teaching and learning activities, and assessment tasks may involve reflective journaling, case studies on overcoming challenges, group projects that require sustained effort, and workshops on stress management techniques. Additionally, mentorship programs, simulation exercises, goal-setting workshops, peer support groups, resilience training modules, service-learning projects, and personal development plans can further support the development of grit (Biangone, 2020; Hagrass et al., 2023; Kramer, 2024). Analyzing case studies of individuals or groups who demonstrated high levels of grit and resilience during crises, engaging students in role-playing exercises to practice crisis management and resilience-building techniques and encouraging students to maintain reflective journals to document their personal experiences and growth in resilience and psychological capital are also beneficial activities.

While personality traits are generally considered to be relatively stable over time, they can still be influenced by significant life events, environmental factors, and intentional interventions. Targeted educational programs and personal development efforts can lead to changes in specific behaviors and attitudes associated with these traits (Hopwood et al., 2011). As such, specific strategies can be used to improve traits such as agreeableness and conscientiousness, along with the more pliable attributes of psychological capital and general self-efficacy (Wang et al., 2023).

In this case, empathy training, cooperative learning, and active listening exercises can enhance agreeableness. Goal-setting workshops, time management training, and self-regulation techniques can foster conscientiousness. Psychological capital can be developed through resilience training programs, positive psychology practices, and fostering a growth mind-set, while GSE can be enhanced through mastery experiences, vicarious learning opportunities, and consistent verbal encouragement

and feedback (Luthans & Youssef-Morgan, 2017). Academic support, such as additional tutoring, study groups, and access to faculty, may assist students in managing their coursework. In addition, greater scheduling flexibility and financial assistance have been demonstrated to alleviate external pressures, allowing students to focus more on their academic studies.

Conversely, when students are in the clinical space, mentorship programs, which pair experienced nurses with nursing students, have been shown to enhance students' professional development, resilience, and overall academic success (Nowell et al., 2017). Mentorship programs must be structured to provide guidance and support, with mentors undergoing training to effectively model perseverance and resilience. Regular meetings and feedback sessions can help students navigate both academic and clinical challenges. Emotional support services, including counselling and peer support groups, can provide a safe space for students to share their experiences and receive emotional support (Nowell et al., 2017).

### LIMITATIONS

Although a sufficient number of students participated in the study, the response rate may not accurately reflect the entire student body. As such, the results should be interpreted with caution. The less-than-optimal response rate could be attributed to the questionnaire being conducted during the mid-year break or due to other urgent matter encountered by students. To enhance the response rate, it may be more effective to conduct the questionnaire at the start or conclusion of the academic year. Further, it must be noted that 710 (27.5%) students had withdrawn from the nursing program between the commencement of the semester and the end of the semester when the questionnaire was administered. Although this was not captured as part of the data collection, it may have some effect on the findings. The data suggest students may have developed a greater capacity to manage and cope with future crises through COVID-19. However, given that a large proportion of the overall cohort had withdrawn from their studies before the questionnaire was administered, it may be postulated that those who withdrew may have lower grit levels. In this case, future research may consider capturing student grit earlier in the year with follow-up studies among students who withdraw.

Finally, while the authors concentrated on established measures, such as the Big Five personality traits, GSE-10, and Psychological Capital Questionnaire, there is a possibility that other new factors also could affect grit. Seligman's (2011) PERMA model, which encompasses measures of Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment, is associated with flourishing or optimal functioning among individuals, groups, and communities. It is one such example and represents a limitation of the current study. The examination of flourishing and well-being on grit may have potential as a future research focus, particularly in the population of interest—nursing students—and currently is being undertaken by the research team.

### CONCLUSION

This study examined the crucial predictive factors of interest consistency and effort perseverance among nursing students 2 years after a large-scale crisis, accompanied by confounding global events, localized inflation, and a rise in the cost of living. Recognizing the key factors that contribute to grit, particularly in times of crisis, helps provide better support to nursing students and the broader health care student community. Enhancing other important elements of grit, such as hope and self-efficacy, is crucial for empowering nursing students when they encounter significant or personal challenges. Therefore, it is recommended that nursing education intentionally includes curricula aimed at fostering grit. This will enhance academic and clinical performance and help students persist and complete their training.

Nurses, health professionals, and the public will continue to face significant challenges, including wars, political instability, economic crises, and future natural disasters related to climate change. These insights emphasize the importance of focusing on key components that support and enhance grit levels before, during, and after crises. Although personality traits are less likely to change, other drivers of grit can be targeted for future development strategies. Understanding and developing more adaptable traits, such as locus of control, hope, and self-efficacy, during or after crises can strengthen individuals. These strategies will support health care providers and benefit the public, who may regularly face crises, and can serve as valuable resources for everyday life.

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