Understanding the Relationship between Mental Health Literacy and Grit in High School Female Athletes

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Author Note

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Abstract

A survey was conducted with 48 female participants (athletes n = 27, nonathletes n = 21) from a rural high school in Utah to determine the correlation between mental health literacy and grit. Each participant completed the modified Multicomponent Mental Health Literacy Measure (MMHLM), shortened Grit-S scale, challenge and commitment constructs from the Mental Toughness Questionnaire 48-item (MTQ48), and additional questions about their views of elite athletes and mental health. Female athletes did not differ from their nonathlete counterparts modified MMHLM scores except for the resource-oriented scores (2.63 ± 1.42 vs.2.71± 1.42, respectively, p = .02). A Mann-Whitney U revealed no statistically significant correlations between total modified MMHLM score and grit, challenge, or commitment (r_s = - .075, 0.181, and -0.080, respectively) for all participants. We found statistically significant, moderate positive correlations for grit and challenge (r_s =.504) and grit and commitment (r_s =.602). For female athletes, no statistically significant correlations were reported between total modified MMHLM scores and grit (r_s = -0.103), total modified MMHLM scores and challenge (r_s = 0.262), and total modified MMHLM and commitment (r_s = -0.075). Again, we found a statistically significant, low positive correlation between grit and challenge (r_s =0.391) and a moderate correlation between grit and commitment (r_s = 0.607) for the female athletes. No statistically significant correlations were reported between MHL and grit for female athletes.

Keywords: mental health, perseverance, commitment, challenge, mental toughness

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The number of adolescents reporting poor mental health is increasing. For instance, there has been a 40 % increase in adolescents experiencing persistent feelings of sadness or hopelessness from 2009 through 2019, and nearly half of female adolescents reported persistent feelings of sadness and hopelessness in 2019 (Centers for Disease Control and Prevention, 2019). Moreover, 12% of female adolescents attempted suicide in 2021 compared to 5% of their male peers (Jones et al., 2022). The range of impacts on adolescents' mental health include difficulties with schoolwork, family economic impacts, hunger, and abuse in the home. The National Federation of State High School Associates (NFHS) estimates that 55.5 percent of all high school students play a sport, and female athletes make up almost 43% of high school athletes (NFHS, 2020). Adolescent athletes experience similar mental health concerns as nonathlete peers, such as anxiety, depression and suicidal ideation, ADHD, eating disorders, and substance abuse (Gorczynski et al., 2017). However, athletes also experience unique stressors, such as fear of failure, parental pressures, and maladaptive coping strategies, which put them at risk for developing or exacerbating mental health disorders. Moreover, females reported a higher prevalence of moderate to severe anxiety symptoms (females = 43.7% versus males = 28.2%) and a higher prevalence of depression symptoms (75.7% versus 59.7%, respectively; McGuine et al., 2021). As such, it is crucial to examine factors that influence the mental health of adolescent female athletes.

Mental health literacy (MHL) is the knowledge of mental health disorders and knowing how and where to seek help (Furnham & Swami, 2018). MHL is a multifaceted array of an understanding of symptoms, personal and societal mental health stigma, and good mental health

practices (Simkiss et al., 2021). Therefore, knowledge of mental health is a driver of positive attitudes about mental health that includes behaviors, such as knowing when and where to seek help and developing competencies designed to improve one's mental health care and self-management capabilities. Research on MHL has found that a poor understanding of mental health impedes individuals from seeking and getting treatment (Goldney et al., 2005). On the other hand, good mental health literacy may lead to better mental health outcomes by facilitating early help-seeking. For instance, Jorm (2012) found a significant positive correlation between high MHL and good mental health. Likewise, Bjørnsen et al. (2019) found that adolescents with positive MHL also had improved mental health. Conversely, moderately to severely depressed adolescents have inadequate MHL (Lam, 2014). Currently, adolescent student athletes' understanding of mental illness is unclear.

Mental health literacy, including understanding how to maintain good mental health, has been known to increase the likelihood of athletes seeking mental health services (Jung, 2016; Nguyen Thai & Nguyen, 2018). Mental health literacy includes understanding where to go to find help if needed for adolescent athletes. Improved MHL and thus help-seeking behaviors lead to better mental health outcomes (Simkiss, 2021); however, high school athletes are less likely to seek help from a psychologist than their college counterparts (Martin, 2005). Sullivan et al. (2021) theorize that increasing MHL in coaches, athletic staff, and athletes could increase help-seeking. Moreover, increasing MHL may be the key to helping at-risk teens find help early, and extracurricular sports programs may be a place to start identifying those at risk for mental health disorders earlier (Mazzer & Rickwood, 2015). However, little research has been reported on adolescent mental health literacy.

Barriers exist for students seeking help for mental health issues. Perceived stigma, lack of encouragement, and lack of access to mental health services are barriers keeping students from seeking help for mental health issues (Eisenberg et al., 2009). Not much research has examined mental health help-seeking in adolescent athletes, but collegiate athletes may experience heightened barriers to seeking mental health care compared to nonathletes (Lopez & Levy, 2013). Predominant feelings in athletics push toughness and invulnerability in athletes, and possible repercussions from coaches and administration, personal discomfort, and lack of time are other barriers that keep student-athletes from seeking mental health services (Ryan et al., 2018). According to Reardon and Factor (2010), with a societal idealization of athletes, student athletes tend to minimize signs of weakness and see mental health issues as weakness. Also, common indicators of mental illnesses resemble athletic behaviors such as scrupulous eating habits and overtraining (Reardon & Factor, 2010). Athletes' belief in mental toughness, including "no pain, no gain," increases a denial of emotional problems, which dissuades the athlete from seeking mental health services (Lopez & Levy, 2013). Moreover, where intercollegiate athletic departments offer mental health services to their student athletes, many do not provide all available services. Student-athletes may only look to their athletic department for help and may not seek services outside their department, leading to ineffective help (Lopez & Levy, 2013). Currently, there is only speculation as to why student-athletes do not seek help; therefore, more research is needed to determine the exact barriers keeping student-athletes from seeking help (Lopez & Levy, 2013).

Passion and perseverance in athletes encapsulate the growth mindset that the belief in the ability to learn and adapt from failures increases the likelihood of success. Duckworth defines this passion and perseverance for long-term goals as grit (Duckworth & Quinn, 2009). Goals take

resilience, ambition, and self-control; however, Duckworth and colleagues determined that the predictor of success is having stamina, or grit, to make their future a reality (Duckworth & Quinn, 2009). Grit and mental health are connected. Datu et al. (2018) found that adolescents have lower levels of depression if they had higher levels of grit. Pennings et al. (2015) found that suicidal ideation decreased as grit increased. Individuals with more grit were more likely to want to stay alive even when life became complicated or overwhelming. Also, grit is a malleable characteristic that can be learned, and enhancing grit levels can lower depression (Majeed et al., 2020). Unfortunately, research has not determined the relationship between MHL and grit.

The present study aimed to determine the mental health literacy of adolescent female athletes compared to nonathletes and examine the correlation between MHL, grit, and the mental toughness constructs of both challenge and commitment. We hypothesized that there would be a positive correlation between grit and MHL, challenge and MHL, and commitment and MHL for athletes. Also, we hypothesized that athletes would have higher grit, commitment, and seek out more challenges than their nonathlete counterparts, while the nonathletes will have a higher MHL. The results from this study help coaches understand mental health literacy among adolescent female athletes and the influence of grit and mental toughness on the athletes' attitudes that promote recognition and appropriate help-seeking.

Methods

Participants

An anonymous internet survey using the Qualtrics platform was distributed through a local Facebook group from February to March of 2022. The inclusion criteria were identifying as female and currently enrolled in high school. Total participants after exclusions were n=48 (athletes n=27, non-athletes n= 21). The survey was anonymous and voluntary, and prior to the

survey, participants were informed of the purpose of the survey and the protection of their personal information. Participants gave their consent before completing the survey. The IRB approved the study before the survey was distributed (IRB Approval #20-022022d). Surveys took no more than 30 minutes to complete.

Methods and Measures

The survey consisted of demographic questions about current school status, gender, athletic participation, and ethnicity, the modified Multicomponent Mental Health Literacy Measure (MMHLM), Short Grit scale, commitment and challenge constructs from the Mental Toughness Questionnaire (MTQ48), and additional questions regarding current events and the athletes' perception of mental health.

Modified Multicomponent Mental Health Literacy Measure. The modified MMHLM is a 14-item version of the original MMHLM created by Jung et al. (2016) that consists of five knowledge-oriented questions, five belief-oriented questions, and four resource-oriented questions, and touches on all seven attributes of MHL (Jorm et al., 1997). The modified MMHLM was used to assess the mental health literacy of each participant (Sullivan et al., 2021). Sullivan et al. (2021) found that the modified MMHLM were valid and reliable measures for the general population and athletes of intercollegiate sports (Cronbach's alpha = .654).

The first ten questions are answered on a 5-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree). Scores of "agree" and "strongly agree" for knowledge-oriented and belief-oriented MHL items were coded as 1 for "presence of MHL" and 0 for all other responses for "absence of MHL," as instructed by Jung et al. (2016, p 279). The four resource-oriented MHL questions are answered with either "yes" or "no," with "yes" indicating the presence of MHL and "no" as the absence of MHL. Thus, scores on knowledge-oriented MHL

and beliefs-oriented MHL can range from 0-5, respectively, and the resource-oriented MHL scores can range from 0-4.

Short Grit Scale. The Grit scale determines the individuals' propensity to sustain effort and maintain interest based on answers to statements using a Likert scale (Duckworth et al., 2007). The shortened Grit-S scale has a Cronbach's Alpha score of .73-.79, showing internal consistency (Duckworth & Quinn, 2009). Although only utilizing eight items instead of 12, the Grit-S scale still maintains the 2-factor structure of the Grit-Original scale. However, it had increased psychometric properties for adolescents, as evidenced in the study completed by Duckworth and Quinn (2009) when they surveyed adolescents using the Grit-S scale.

For Grit-S, questions 2, 4, 7, and 8, five points were given for answering "Very much like me," four points for "Mostly like me," three points for "Somewhat like me," two points for "Not much like me" and one point for "Not like me at all." For questions 1,3,5 and 6, one point was given for answering "Very much like me," two points for answering "Mostly like me," three points for answering "Somewhat like me," four points for answering "Not much like me," and with five points for answering "Not like me at all." Once all the grit scores were assigned their correlating point values, a total was summated and then divided by 8. The maximum score on this scale is 5, meaning "extremely gritty," and the lowest score on this scale is 1, meaning "not gritty at all."

Mental Toughness. Measurements of mental toughness determine the level of resistance to the adverse effects of stress (Perry et al., 2021). The mental toughness constructs challenge and commitment were measured using the items from the Mental Toughness Questionnaire 48-items (MTQ48; Clough et al., 2002). The MTQ48 is a widely used tool to measure the constructs of challenge, commitment, control, and confidence. For this study, only challenge and

commitment constructs were assessed. In testing the internal consistency of the six factors of the MTQ48, five of the six had acceptable internal consistency (x=.78-.85), with only control being lower (x = .59), with a CFA for athletes of .779 (Perry et al., 2013).

Questions about the challenge construct measured the extent to which tests or perceived barriers were viewed as opportunities and learning experiences (Perry et al., 2021). Items to assess challenges included: "I usually find something to motivate me," "Challenges usually bring out the best in me," "I am willing to give whatever it takes to reach my full potential as a player," and "I generally cope well with any problems that occur." A higher score on the challenge scale indicates an individual actively seeks situations that are good for self-development and may thrive in ever-changing environments. A lower score indicates an individual that avoids challenges out of fear of failure or aversion to the effort and prefers stable, unchanging environments. To score this aspect of the questionnaire, an answer of "strongly agree" was given 5 points, "agree" was given 4 points, "neither agree nor disagree" was given 3 points, "disagree" was given 2 points, and "strongly disagree" was given 1 point. The range of points possible for the challenge scale was between 4-20.

Questions about the commitment construct measured persistence and successful completion of tasks that encourages fulfillment (Perry et al., 2021). Those who score high on the commitment scale can achieve success and handle challenging tasks in appropriate timeframes. Those scoring lower do not do well with maintaining deadlines or handling complex demands. The following items were used to measure commitment: "I do not usually give up under pressure," to which they were given a score of 5 points for answering "strongly agree," 4 points for "agree," 3 points for "neither agree nor disagree," 2 points for "disagree" and 1 point for "strongly disagree." For the questions, "I usually find it difficult to make a mental effort when I

am tired," "When faced with difficulties, I usually give up," and "I usually find it hard to summon enthusiasm for the tasks I have to do," 1 point was given for answering "Strongly agree," 2 points were given for "agree," 3 points were given for "neither agree nor disagree," 4 points were given for "disagree," and 5 points were given for "strongly disagree." The range of possible scores is from 4 to 20 points.

Additional Questions. Additionally, questions on perceptions of elite athletes and mental health were included. Specifically, "Professional and elite athletes should avoid all activities or situations that make them feel anxious if they are having difficulties with mental health" and "When professional and elite athletes decide not to compete for mental health issues, I am more confident to take my mental health day." A Likert scale determined how much they agreed/disagreed with each statement. Before those questions, participants were asked whether they knew of Simone Biles, which would start the participants thinking about current events of elite athletes in the news regarding mental health concerns. The intent was to measure how student athletes perceive real-world mental health issues elite athletes face.

Statistical Analysis

After surveys were completed, Mann-Whitney U was used to compare correlations in athletes and nonathletes between mental health literacy, grit, challenge context, commitment context, as well as the additional questions. The Spearman's rank-order correlation was used to measure the strength and the directional relationship between MMHLM, grit, challenge, and commitment constructs. The strength of the relationship was interpreted using guidelines from Hinkle et al. (2003). A correlation coefficient between |0.9 to 1.00| was interpreted as ‘very high,’ |0.7 to 0.9| as ‘high,’ |0.5 to 0.7 | as ‘moderate,’ |0.3 to 0.5| as low, and |< 0.3| as

"negligible.' The significance level is $p < .05$. Statistical analysis was performed using SPSS Statistics Software Version 25® (IBM, Armonk, New York, USA).

Results

Belief-oriented MHL scores for female athletes were statistically higher than female non-athletes ($p = .020$; Table 1). In addition, grit and commitment scores were higher in female athletes than in female non-athletes ($p = .003$ and $p = .001$, respectively; Table 1). At the alpha level of 0.1, female athletes reported higher challenge scores than nonathletes ($p = .067$). For the additional questions, the only question that had a statistical difference was regarding knowing when to push through practice ($p = .021$; Table 1).

There was a statistically significant, moderate positive correlation between grit and challenge scores ($r_s(47) = .504$, $p = .000$), and grit and commitment scores ($r_s(47) = .602$, $p = .000$). However, no statistically significant correlation was found between total modified MMHLM and grit scores ($r_s(48) = -.075$, $p = .612$), total modified MMHLM and challenge scores ($r_s(47) = 0.181$, p .222), and total modified MMHLM and commitment scores ($r_s(47) = -.080$, $p = .594$).

When examining the responses from female athletes only, we found a statistically significant, low positive correlation between grit and challenge scores ($r_s(26) = .391$, $p = .048$), and moderate positive correlation between grit and commitment scores ($r_s(26) = 0.607$, $p = .001$). There was, however, was no statistically significant correlation between total modified MMHLM and grit scores ($r_s(27) = -.103$, $p = .611$), total modified MMHLM and challenge scores ($r_s(26) = .262$, $p = .195$), and total modified MMHLM and commitment scores ($r_s(26) = -.075$, $p = .716$).

During the recent Tokyo 2020 Summer Olympics, Simone Biles was scrutinized for not participating in the Team All-Around Finals for Gymnastics (Thompson et al., 2022). Therefore,

scores were analyzed, testing for a correlation between those who knew of Simone Biles and modified MMHLM, grit, challenge, and commitment scores. Female adolescent athletes that knew Simone Biles reported higher grit scores (3.11 ± 0.57) than their peers (2.55 ± 0.73), who indicated that they did not know Simone Biles (p =.014).

Discussion

This study examined MHL, grit, commitment, and challenge scores in adolescent female athletes and nonathletes. We found that adolescent female athletes reported higher belief-oriented MHL than nonathletes. Adolescent female athletes not only have a base knowledge of mental health and where to find necessary resources, but they have developed the confidence to act on the knowledge and resources compared to nonathletes. According to previous research, female athletes tend to have lower levels of stigma toward seeking mental health help (Jung et al., 2016) and are more likely to seek mental health help than nonathletes (Jung et al., 2016; Kim et al., 2015; O'Connor et al., 2014). Adolescent female athletes in this study appear to be more confident in seeking mental help than their nonathlete counterparts, which agrees with results found by Jung et al. (2016).

Grit, defined as the combination of perseverance and passion for long-term goals, is associated with various indicators of well-being (e.g., life satisfaction, meaning in life, and psychological well-being); therefore, gritty individuals would be less prone to adverse mental health outcomes due to their propensity to experience obstacles and failures in a positive way (Hill et al., 2016; Kleiman et al., 2013; Pennings et al., 2015; Sharkey et al., 2017). As expected, athletes scored higher on measures of grit compared to nonathletes. This result is consistent with prior studies, which have found that higher grit is related to higher engagement in sport (Martin et al., 2015) and physical toughness (Duckworth & Quinn, 2009). Ergo, it was hypothesized that

grittier adolescent females were more confident in seeking mental help. However, we did not find a correlation between grit scores and MHL in adolescent females nor adolescent female athletes. Studies of this kind, linking grit to MHL, or mental health outcomes, are remarkably scarce. It is critical to further research examining the association between grit and mental health, especially among adolescent students.

Adolescent female athletes from this study reported higher mental toughness, specific to commitment and challenge, than nonathletes. Mental toughness can help athletes produce consistently high-performance levels and sustain goal-directed behavior, despite everyday challenges and stressors (Gucciardi et al., 2015; Hardy et al., 2014). Moreover, mental toughness has been associated with behavioral perseverance (Giles et al., 2018; Gucciardi et al., 2021), the use of psychological skills (Ponnusamy et al., 2018), thriving (Gucciardi et al., 2017), and coping with adversity (Swann et al., 2016). Studies in adolescent athletes, for example, have reported inverse associations between mental toughness and depression, anxiety, stress, and burnout (Gucciardi & Gordon, 2009; Gucciardi & Jones, 2012). Thus, it was hypothesized that mental toughness constructs, specifically commitment and challenge, would be associated with MHL. However, we did not find a correlation between commitment and challenge scores and MHL in adolescent females or adolescent female athletes. Little is known about the relationship between MHL and mental toughness. Similar to our findings, Bird et al. (2021) found that mental toughness, using the mental toughness index, was not related to public stigma and self-stigma toward mental health; however, they did report higher levels of mental toughness were associated with lower levels of stigma toward mental health help-seeking. Therefore, adolescent female athletes might view seeking support for a mental health concern as the behavior they need

to engage in to move toward achieving their goals and, as a result, are confident in seeking mental help, although further research is needed.

In addition, female adolescent athletes' confidence in knowing when to push through practice was higher than their female adolescent nonathlete counterparts. This finding is expected since understanding one's limits can be trained through consistent training where the participant experiences both failure and success (Fifer et al., 2008). Therefore, athletes will have more training in knowing when to push through practice. The balance between knowing when to push through practice and when to recover is imperative to an athlete's success and mental health. Coaches should attempt to insight enthusiasm and motivation in athletes to push their limits, which in turn gives athletes practice at knowing when to push and when to recover, rather than using the inferior methods of force or coercion, which may lead to mental health issues (Johns & Johns, 2000). Moreover, Foucault defines this understanding of personal limits as compliance. As Foucault contends, disciplinary power is a mechanism of power that allows individuals to determine compliance through institutions and interactions (Johns & Johns, 2000). Sports teams provide these institutions and interactions that Foucault deemed necessary through built-in institutions and social support to recognize mental health issues, provide counseling, and academic assistance that will lead to successful mental health resolutions (Proctor & Boan-Lenzo, 2010), and early recognition helps students acquire more effective help (Mazze & Rickwood, 2015).

Female adolescent students that knew of Simone Biles reported higher grit scores than their peers who did not know Simone Biles. Those with higher grit scores were athletes who might be more likely to know of an elite athlete like Simone Biles. However, knowing whom she did not impact MHL scores or knowing when to push through practice or when to rest. Athletes

may know more about when to push and rest than nonathletes. This would mean that female athletes are not using her nonparticipation for mental health reasons as an excuse for lack of grit.

Limitations and Further Research

Where the MTQ48 has been established as a valid and reliable survey (Perry et al., 2013), separating the mental toughness constructs and only testing the challenge and commitment constructs may impact the validity and reliability of the survey. Also, all participants came from one high school in a small town in Utah. Larger schools, multiple schools, or schools in metropolitan areas may provide different results. Another limitation is that sample size was small (n = 54), and most of the participants (n = 48) were "Caucasian", with only 1 choosing "Native American", 3 choosing "other", and 2 choosing "Multiple ethnicities". Further research could be done in more ethnic diverse communities.

Conclusion

It would be necessary to the narrative to understand if having high MHL and high grit scores positively affects performance. We do know that a higher MHL does not mean a higher grit score, or higher mental toughness; Coaches can help their athletes understand the balance between good mental health practices and grit through consistent application of optimal mental health practices along with grit and mental toughness constructs. There are innumerable other possibilities for further research based on these findings.

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Appendix A

Tables

Table 1

Mean and Standard Deviation of Mental Health Literacy, Grit, Mental Toughness, and Responses to Additional Questions.

	Athletes (n = 27)	Non-Athletes (n = 21)	Total (N = 48)
Modified MMHLM			
Knowledge-Oriented	2.93 ± 1.27	3.05 ± 1.20	2.98 ± 1.23
Beliefs-Oriented	0.70 ± 1.03	0.14 ± 0.36	0.46 ± 0.85
Resource-Oriented	2.63 ± 1.42*	2.71 ± 1.42	2.67 ± 1.40
Total	6.26 ± 2.30	5.90 ± 2.02	6.10 ± 2.17
Grit	3.19 ± 0.54*	2.61 ± 0.68	2.93 ± 0.67
Mental Toughness			
Challenge	16.46 ± 2.64*	13.52 ± 2.80	15.15 ± 3.06
Commitment	13.15 ± 2.91	11.38 ± 2.89	12.36 ± 3.00
Additional Questions			
#1	3.37 ± 0.63	3.14 ± 0.79	3.27 ± 0.71
#2	2.37 ± 0.84	2.14 ± 0.91	2.27 ± 0.87
#3	2.73 ± 0.87	2.67 ± 1.11	2.70 ± 0.98
#4	3.35 ± 0.85	3.24 ± 1.04	3.30 ± 0.93
#5	3.58 ± 0.95	3.05 ± 1.28	3.34 ± 1.13
#6	4.51 ± 0.68*	3.71 ± 0.90	4.04 ± 0.83

* $p < 0.05$; MMHLM = Modified mental health literacy;
For addition question #1 and #2, points were assigned as follows: 1 = Very Unhelpful; 2 = Unhelpful; 3 = helpful; 4 = Very Helpful. Scores ranged from 1-4.

1. To what extent do you think it would be helpful for someone to improve their quality of sleep if they were having difficulties managing their emotions (e.g., becoming very anxious or depressed)
2. To what extent do you think it would be helpful for someone to avoid all activities or situations that made them feel anxious if they were having difficulties managing their emotions?

For addition question #3 through #6, points were assigned as follows: 5 = Strongly agree; 4 = Somewhat agree; 3 = Neither agree nor disagree; 2 = Somewhat disagree; 1 = Strongly disagree. Scores ranged from 1-5.

3. Professional and elite athletes should avoid all activities or situations that made them feel anxious if they were having difficulties with mental health.
4. When professional and elite athletes decide not to compete for mental health issues, I am more confident to take my own mental health day.
5. I am confident I know when I need to take time off to recover.
6. I am confident I know when it's appropriate to push through practice.