

# Thriving Through Sport:

The Transformative Impact on  
Girls' Mental Health

# Letter from the CEO

America's youth are experiencing a mental health crisis, and their futures are on the line. Across the nation, we have witnessed an alarming increase in mental health challenges among young people, and while mental health concerns were exacerbated by COVID-19, these issues were prevalent long before the pandemic. National surveys reveal increases in anxiety and depression among young people, as well as a lack of adequate resources for prevention and intervention.

That is why when the U.S. Surgeon General beckoned the nation to prioritize young people's mental health, we did not hesitate to answer the call.

Mental health is indeed complex, and we know sports can have powerful impacts. When it comes to sport and mental health, and especially, but not exclusively, at the most competitive levels of play, sport environments that are toxic can lead to adverse mental health consequences. We have heard far too many stories about athletes whose mental health has suffered; and for some, their experiences have been devastating.

But the converse also holds true. Getting it right in sport, creating healthy sport environments with coaches that prioritize mental health can lead to positive and protective mental health outcomes, as evidenced in this new research.

For 50 years and counting, the Women's Sports Foundation has recognized the powerful connection between sport and physical and mental health. We have advocated tirelessly for greater access to sport for girls and women and supported community programs to ensure girls have more opportunities to play.

The Women's Sports Foundation's new research report, *Thriving through Sport: The Transformative Impact on Girls' Mental Health*, provides new evidence that underscores the critical role that sport can play in boosting positive mental health. It offers an examination of how sport can protect against anxiety and depression and promote protective factors, such as social connectedness and building a sense of meaning and purpose.

Above all, the data in this new report is a call to action for coaches, educators, pediatricians, mental health practitioners, parents, and others. When girls play sport in programs that elevate girls' voices, emphasize personal growth, and foster healthy relationships – girls thrive.

There is still a lot of work to be done to ensure that all girls have equitable access to sport. As outlined in our 2022 report, *50 Years of Title IX: We're Not Done Yet*, girls from marginalized communities, including girls of color, girls with disability, LGBTQ+ youth and those from low socioeconomic households, face even greater obstacles to play. Equitable access is especially important given this new research, which shows that mental health benefits of sport can be a great equalizer. When girls play in sport environments that prioritize well-being, they are able to play, compete and lead – in sport and in life.

The Women's Sports Foundation is deeply grateful to the Kozmetsky Family Foundation for the generous funding which made this report possible.

The Women's Sports Foundation is proud to be at the forefront of research and practice; and we look forward to working with experts across sport, youth development, education, medicine, and mental health to ensure that all girls have an opportunity to thrive in sport. Doing so will ensure that girls succeed in all areas of their lives, from family and community life to school and the workplace. All girls. All women. All sports®  
#KeepPlaying



Danette Leighton  
CEO, Women's Sports Foundation

# Acknowledgments

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## About the Kozmetsky Family Foundation

The Kozmetsky Family Foundation arose from the RGK Foundation, an Austin-based family foundation formed in 1966 by Ronya and George Kozmetsky. Over a 50-year span, the RGK Foundation awarded more than 3,500 grants totaling over \$133 million, with an emphasis on programs that serve vulnerable populations and build the institutional capacity of the nonprofit sector. Its signature investments over the years include support for the creation of the RGK Center for Philanthropy and Community Service at the University of Texas at Austin's LBJ School of Public Affairs. In order to allow the family's third and fourth generations to contribute and to continue the legacy of serving their communities, the Kozmetsky Family Foundation was formed in 2017 and is committed to sparking meaningful impact through grants for basic needs, education, and health, with special emphasis given to veterans, women, and children.

## About the Women's Sports Foundation

The Women's Sports Foundation exists to enable girls and women to reach their potential in sport and life. We are an ally, an advocate, and a catalyst. Founded by Billie Jean King in 1974, we are one of the first organizations to recognize the powerful connection between sports access, equity, and society. WSF has been changing the game for 50 years through its research, advocacy, and community programming, investing over \$100 million to help girls and women play, compete, and lead – in sports and beyond – without barriers. A leader and champion of the entire women's sports ecosystem, WSF amplifies the vital societal and cultural impact that is made when girls and women play sports. All girls. All women. All sports. To learn more about the Women's Sports Foundation, please visit [www.WomensSportsFoundation.org](http://www.WomensSportsFoundation.org).

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# Executive Summary

Today's youth are at an increasingly high risk of mental health disorders (Office of the Surgeon General, 2021). The ongoing mental health crisis of children and adolescents was only worsened by the confluence of issues brought about by the COVID-19 pandemic (Hiebert & Kortess-Miller, 2021) with continued growing rates of anxiety and depression as well as elevations in suicidal ideation and thoughts of self-harm among today's youth (Reinert et al., 2021). Given the popularity and reach of sport, along with promising research on positive developmental impacts, The Women's Sport Foundation (WSF) commissioned the *Thriving Through Sport: The Transformative Impact on Girls' Mental Health* report to examine the relationship between sport participation and mental health in adolescent girls.

Over the past two decades, researchers examining the broad-scale benefits of sport participation have reported a positive association between sport participation and mental health of young people (e.g., Easterlin et al., 2019; Graupensperger et al., 2021; Murray et al., 2021;

Zuckerman et al., 2020). This literature has indicated that compared to non-participants, youth who participate in sport tend to report a wide range of better mental health outcomes including higher self-esteem/self-concept (Wiersma et al., 2008; Findlay & Coplan, 2008), positive affect (Findlay & Coplan, 2008), life satisfaction (Michaud et al., 2006), fewer depressive symptoms (Boone & Leadbeater, 2006; Gore et al., 2001; Zarrett, Veliz, & Sabo, 2018), and less anxiety, stress, hopelessness/fatalism or suicidality (Dimech & Seiler, 2011; Taliaferro et al., 2011; Taliaferro et al., 2008; Zarrett, Veliz, & Sabo, 2018).

However, not all evidence for the relationship between sport and mental health has been positive, with previous studies showing that sport can do harm (e.g., Massey & Whitley, 2021). Further, many studies that do exist do not clearly indicate whether sport participation leads to better mental health outcomes, or whether those who have better mental health are more likely to participate in sport. Mixed findings of previous studies have likely resulted because few studies have considered the unique



qualities of youth participation (e.g., degree of exposure and commitment) or the quality of the sport setting (e.g., team cohesion, coach–player relationships). Further, little is known about whether participation may be more beneficial for certain demographic groups or whether youth across race, genders, sexual orientation, socioeconomic conditions, and disability benefit similarly.

The present report set out to examine:

1. What is the relationship between sport participation and mental health in adolescent girls?
2. How do the characteristics of the sport environment affect the relationship between sport participation and mental health?
3. Does the relationship between sport and mental health differ across contexts and demographic groups?

The research used for this report entailed three major components. First, we extracted data from the Adolescent Brain and Cognitive Development (ABCD) Study (Barch et al., 2018) to examine sport participation and clinical levels of mental health for a nationally representative sample of 11,875 children. With these data, we examined how participation in sport, duration of participation in sport, and number of sports played influenced rates of clinical mental health problems in girls

and boys. Next, we commissioned eight focus groups with 45 girl athletes to better understand how girls themselves perceived the relationship between sport and mental health, and what factors facilitated or impeded this relationship. With the knowledge gained from these two data sets, the WSF commissioned a nationally representative survey of 2,956 girls between the ages of 12 and 17 and their parent/guardian. The data included girls who currently participate in sport ( $n = 1,677$ ), girls who previously participated in sport ( $n = 343$ ), and girls who have never participated in sport ( $n = 936$ ). The survey examined the relationship between sport participation and depression, anxiety, peer relationships, and a sense of meaning and purpose. Results give insights into the unique contribution of sport to mental health, the conditions under which sport is most beneficial for mental health, and the relationship of sport and mental health across a range of socio-demographic groups.





# Key Findings

1. **Playing sport has a significant impact on girls' mental health.** When girls play sport in high-quality environments, they benefit in multiple areas of mental health, from decreased levels of depression and anxiety to stronger peer relationships and greater levels of meaning and purpose.
2. **Sport participation can lower anxiety and depression.** Girls who play sport in positive environments report significantly lower levels of anxiety and depression than those who previously played or never played. Aligned with previous research that has examined the relationship between sport and mental health (Easterlin et al., 2019; Graupensperger et al., 2021; Murray et al., 2021), girls in the study sample who currently participate in sport had significantly lower depression and anxiety scores when compared to girls who had previously played sport and girls who had never played sport. The odds of having a moderate-to-high depression or anxiety score were nearly twice as high for girls who never participated in sport than for girls who currently participate in sport. See Figures 8 and 10 on pages 24 and 25.
3. **Sport helps girls thrive.** Girls in the study who currently participate in sport had significantly higher reports of peer relationships and meaning and purpose when compared to girls who had previously played sport and girls who had never played sport. The odds of having a moderate-to-high peer-relationship or meaning and purpose score were approximately 1.5 times higher for girls who currently participate in sport compared to girls who never participated in sport. See Figures 12 and 14 on page 26.
4. **The quality of the sport environment is a driving factor for mental health.** The findings in this report point to the importance of the environment created within sport. Coaches are tasked with being key actors in delivering a quality program to promote engagement and positive health outcomes. When winning and social comparisons are the focus, mental health outcomes are no better, and sometimes worse, than not playing sport at all. However, when winning and social comparisons are de-emphasized in favor of other goals (e.g., mastery, collaboration, personal development), the benefits to mental health can be substantial, as data in the current study indicate. To support youth's needs for autonomy (defined as an individual's sense of having choice, an internal perceived locus of causality, and volition), autonomy-supportive coaching (Mageau & Vallerand, 2003; Ryan & Deci, 2017) involves engaging youth in dialogue (two-way communication), providing youth meaningful choices, acknowledging athletes' feelings and seeking to understand youth's perspectives, and providing



opportunities and demonstrating shared values for youth input and voice. These components are critical in ensuring sport is structured to optimize the mental health of participants. See Figures 50–53 on pages 39–40.

5. **The protective and promotive benefits of sport for mental health are unique relative to other extracurricular activities.** Findings in this study suggest that sport might provide additional benefits above and beyond participation in non-sport extracurricular activities. When comparing the number of activities, number of years engaged, and hours a week of participation, girls who participate in sport have lower levels of depression and anxiety, and higher levels of peer relationships and meaning and purpose than girls who only participate in non-sport extracurricular activities. One explanation for this might be that sport programming is a primary setting for youth to acquire the recommended levels of 60 minutes or more of daily moderate-to-vigorous physical activity. In turn, several reviews have indicated that engaging in regular daily physical activity is protective against depression and anxiety symptoms (Ahn & Fedawa, 2011; Biddle et al., 2019) and can significantly reduce depression, anxiety, psychological stress, and emotional disturbances in both clinical and nonclinical samples of children and adolescents. In our study, we also saw significant improvements in peer relationships the more time girls spent in sport, a finding we did not observe for other activities. See Figures 15–16 on page 27.

6. **Lack of access remains a hurdle for many girls.** Data in the current study show an ongoing trend of inequity in access to sport, particularly for girls with intersectional identities of groups that have been historically marginalized in both sport and society. Girls who identify as White were significantly more likely to be sport participants than not (57% vs. 44%), whereas girls who identify as Black (11% vs. 17%), Hispanic (23% vs. 27%), or other races (8% vs. 12%) were significantly less likely to be sport participants. Girls also were significantly more likely to be sport participants if their reported household income was over \$100,000 annually and significantly less likely to be sport participants if their annual household income was less than \$50,000. Girls with disabilities were significantly less likely to be sport participants (4% of sport participants reported a disability vs. 11% of non-sport participants), as were girls who identified as part of the LGBTQ+ community (6% of sport participants identified as LGBTQ+ vs. 12% of non-sport participants). See Figure 73 on page 50.
7. **Girls from all backgrounds benefit.** There is a clear positive connection between girls' sport participation and positive mental health outcomes across race, family income, parent education, sexual identity, and disability status. Thus, when girls are able to access sport, there is a clear positive connection between girls' sport participation and positive mental health outcomes with data in the current study showing those outcomes consistent across race, family income, parent education, sexual identity, and disability status.
8. **Coaches play a vital role in optimizing mental health.** Coaches who create a high-quality environment, are supportive, and foster team cohesion, can have a significant impact on the mental health of girls. Our data showed that fostering a motivational climate that took the focus away from winning, comparing athletes against each other, and focusing on the athletes with the most skill, had the most substantial benefits for mental health. See Figures 39 and 41 on pages 35 and 36.
9. **Relationships with the coach matter.** In the current study, all mental health outcomes were affected by the coach-athlete relationship in girls' primary sport. For girls reporting low or medium levels of positive relationships with their coaches, depression and anxiety scores were similar or worse than those of non-sport participants. However, those reporting high levels of coach relationships have significantly lower depression scores and anxiety scores than all other participants. Our data show that only 13.4% of girls in the high coach relationship group were categorized in the moderate-to-high depression group, which is significantly lower than the 28.9% of girls with moderate-to-high depression scores in the medium coach relationship group. Similarly, only 8.9% of girls in the high coach relationship group were categorized in the moderate-to-high anxiety group, compared with 21.9% and 20.8% of girls in the medium and low coach relationship groups respectively. See Figure 67 on page 46.
10. **Sport sampling versus specialization leads to significantly better mental health outcomes.** While we did not find difference in mental health outcomes based on type of sport (i.e., team vs. individual), the competition level in sport (i.e., recreational vs. competitive), or the contact level (i.e., non-contact vs. contact), we did find that girls who participated in multiple sports reported significantly better outcomes for depression, anxiety, peer relationships, and meaning and purpose (see Figure 28 on page 32). In addition, data we analyzed from the ABCD study showed rate of clinical depression was 3.3 times lower for girls who participated in at least two sports than for those who did not participate in sport (1.1% vs. 3.6%). Similar decreases existed for clinical levels of somatic complaints (2.5% vs. 4.1%; 1.6 times lower), social problems (1.2% vs. 2.2%, 1.8 times lower), thought problems (2.4% vs. 4.9%, 2 times lower), aggressive behavior (1.2% vs. 3.3%, 2.8 times lower), ADHD symptoms (1.9% vs. 3.9%, 2 times lower), and conduct problems (1.8% vs. 5.0%, 2.8 times lower) when comparing girls who play two or more sports to girls who do not participate in sport.
11. **Long-term engagement in sport matters for mental health.** While the type of sport may not determine girls' mental health, playing individual and/or team sport(s) over a longer period of years can contribute to positive mental health benefits. Data analyzed from the ABCD study showed a clear trend that longer engagement in sport led to reduced mental health disorders for girls, with the largest decreases in clinical mental health issues for girls participating in sport for at least five years.



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When compared to non-sport participators, girls playing for five years or more were 5 times less likely to have clinical levels of conduct problems (1.0% vs. 5.0%); 4.7 times less likely to have aggressive behavior problems (0.7% vs. 3.3%); 3.6 times less likely to be clinically depressed (1.0% vs. 3.6%); 2.8 times less likely to have clinical levels of ADHD symptoms (1.4% vs. 3.9%); 2.4 times less likely to have clinical levels of thought problems (2.0% vs. 4.9%); 2.4 times less likely to have somatic complaints (1.7% vs. 4.0%); and 1.8 times less likely to have clinical levels of attention problems (1.8% vs. 3.3%). See Figure 5 on page 19.

- 12. For girls with disabilities, among the many benefits sport provides is an increased level of meaning and purpose.** In the current study, girls with disabilities reported lower levels of sport participation and worse mental health outcomes than the general study population. However, girls with disabilities who participate in sport reported lower levels of depression and anxiety and higher levels of peer relationships and meaning and purpose than girls with disabilities who have never played sport. Data in the current study showed that the largest gains for girls with disabilities were for a sense of meaning and purpose. See Figure 78 on page 52.

- 13. Girls who play sport are more involved in other activities.** Sport participation is a driver of youth engagement more broadly. Those who play sport also are more likely to participate in other clubs/activities than those who don't play sport. Our data show that current sport participants are significantly more likely than non-sport participants to participate in school clubs (40.4% vs. 25.9%), music (34.6% vs. 29.0%), community service (34.5% vs. 21.4%), religious activities (28.0% vs. 17.8%), and academic enrichment activities (22.6% vs. 15.3%). Thus, sport may provide a positive reinforcement loop, which motivates young people to be involved in other positive developmental activities, thereby amplifying the overall benefit from sport. See Figure 27 on page 31.



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# Introduction

Today's youth are at an increasingly high risk of mental health disorders (Office of the Surgeon General, 2021). The ongoing mental health crisis of children and adolescents was only worsened by the confluence of issues brought about by the COVID-19 pandemic (Hiebert & Kortess-Miller, 2021) with continued growing rates of anxiety and depression as well as elevations in suicidal ideation and thoughts of self-harm among today's youth (Reinert et al., 2021). Given its reach and popularity, along with promising research on positive developmental impacts, sport has emerged as an interest of researchers and policy makers as a potentially low-cost and high-impact solution to promote the mental health of young people (Reid et al., 2021).

Over the past two decades, researchers examining the broad-scale benefits of sport participation have reported a positive association between sport participation and mental health of young people (e.g., Easterlin et al., 2019; Graupensperger et al., 2021; Murray et al., 2021; Zuckerman et al., 2020). This literature has indicated that, compared to non-participants, youth who participate in sport tend to report a wide range of better mental health outcomes, including higher self-esteem/self-concept (Wiersma et al., 2008; Findlay & Coplan, 2008), positive affect (Findlay and Coplan, 2008), and life satisfaction (Michaud et al., 2006); fewer depressive symptoms (Boone & Leadbeater, 2006; Gore et al., 2001; Zarrett, Veliz, & Sabo, 2018); and less anxiety, stress, hopelessness/fatalism or suicidality (Dimech & Seiler, 2011; Taliaferro et al., 2011; Taliaferro et al., 2008; Zarrett, Veliz, & Sabo, 2018).

However, previous studies have not clearly indicated whether sport participation leads to better mental health outcomes or whether those who have better mental health are more likely to participate in sport. For example, several studies have shown that sport participation during adolescence is associated with better mental health into adulthood for those with adverse experiences in childhood. However, these studies also showed that youth with the greatest exposure to adverse childhood experiences and the poorest mental health were the least likely to participate in sports (Noel-London et al., 2021; Graupensperger et al., 2021). Thus, those who enter sport, on average, are likely to have better mental health outcomes than those who do not participate in sport. Additionally, in one large nationally representative longitudinal study, positive associations between sport participation and indicators of mental health were either weakened or no longer significant when controlling for youth mental health prior to participation (Easterlin et al 2019). Another study demonstrated bidirectional relations between mental health and sport participation, where mental health is both a predictor and an outcome of youth sport participation during middle adolescence (ages 12-14; Vella et al., 2017).



Mixed findings of previous studies have likely resulted because few studies have considered the unique qualities of youth participation (e.g., degree of exposure and commitment) or the quality of the sport setting (e.g., team cohesion, coach-er relationships). Further, little is known about whether participation may be more beneficial for certain demographic groups or whether youth across race, genders, sexual orientation, socioeconomic conditions, and disability benefit similarly. For example, there have been notable and contrasting findings regarding gender differences in who benefits from sport, with some studies reporting that boys benefit more from sports than girls do (Patel & Greydanus, 2010) and others demonstrating greater benefits in mental health for girls than boys (Super et al., 2018). Similarly, the few studies that have examined the relationship between sport participation and mental health among youth with a physical disability, a highly understudied population, have suggested that those with physical disabilities who play adaptive sport may have a better quality of life and satisfaction than those who were not involved in sport. Moreover, sport participation is related to better overall psychosocial health among children and adolescents with a disability (Puce et al., 2019; Te Velde et al., 2018; Yazicioglu et al., 2012).

It is also worth noting that researchers also have documented harms that can take place within sport and the sport environment (e.g., Massey & Whitley, 2021). Thus, contextual variables within the sport environment are likely to drive the association between sport participation and mental health.

Therefore, the present report set out to broadly examine: (a) the relationship between sport participation and mental health, specifically in adolescent girls; (b) how the characteristics of the sport environment affected the relationship between sport participation and mental health; and (c) if the relationship between sport and mental health differed across contexts and demographic groups.

### Qualities of Youth Participation

To better understand if sport is a causal agent for mental health outcomes, it would be important to establish a dose-response relationship. Sport participation is often analyzed as a dichotomous variable (does or does not participate). However, the frequency, cross-year duration, type of sport, and number of sports that youth participate in all likely matter in the degree to which sport participation fosters youth mental health (Evans et al., 2017). The frequency and cross-year duration of participation not only measure the degree of exposure youth have to a sport environment but also can be considered an indicator of the degree to which youth are engaged/committed to sport, both of which support positive gains from participation (Zarrett & Lerner, 2008; Zarrett et al., 2009). For example, previous research has shown youth who participate more frequently in sport (e.g., at least twice a week, Michaud et al., 2006; three or more hours weekly, Sanders et al., 2000; Zarrett

& Lerner, 2008) and for more years (Bowker, 2006; Zarrett et al., 2009) reported lower depressive symptoms than youth with less frequent and a shorter duration of sport participation. There also has been little to no research that has examined whether adolescent well-being varies from sport to sport. Each sport has a distinct subculture and provides a distinct experience that likely influences youth behaviors and development in different ways (Schinke & McGannon, 2015; Zarrett, Veliz, & Sabo 2018), suggesting that some sports may be more apt to foster youth well-being than others. For example, a previous Women's Sports Foundation report, *Teen Sport in America* (Zarrett, Veliz, & Sabo, 2018), found that youth who participated in more popular sports (e.g., basketball, baseball/softball, soccer, football, tennis, and track and field) fared better than the national average on multiple indicators of psychological well-being, including self-esteem, self-efficacy, social support, loneliness, and self-derogation. In contrast, youth participating in less popular sports (e.g., crew, wrestling, ice hockey) fared significantly worse in overall psychological well-being compared to the national average, with the highest rates of loneliness, fatalistic attitudes, and self-derogation, and the lowest self-esteem and social support. Similarly, some studies have indicated that only participation in team sports are predictive of fewer depressive symptoms and lower psychological distress among girls (Blain et al., 2023; Graupensperger et al., 2021; Guddal et al., 2019) and that depression and anxiety might be higher among



individual sport athletes (Pluhar et al., 2019). Finally, previous research has provided substantial evidence that youth reap the greatest benefits from their participation when they are engaged in two or more sports across the year (Zarrett, Veliz, & Sabo 2018; Zarrett & Veliz, 2021). Positive experiences in one sport setting can buffer a negative experience in another sport setting (e.g., poor coach-er relationship) and prevent dropout or other negative outcomes. Participation in multiple sports is believed to expose youth to a broader range of growth-related experiences and skills and the opportunity to exercise these skills across multiple settings and with different sets of peers and adults. In this way, there are greater chances to access some of the key resources of sport that foster well-being, such as building a strong sense of competency and initiative, and close connections with others who share the same interests and goals.

### Quality of the Sport Setting

A greater understanding of the processes or mechanisms by which sport fosters youth mental health is needed. Program quality, which goes beyond strictly focusing on content (e.g., providing basketball training and competition) and considers the climate and processes by which a program is delivered, has been identified as critical for promoting positive psychosocial outcomes in youth programming (Eccles & Gootman, 2002; Granger et al., 2007; Yohalem & Wilson-Ahlstrom, 2010). According to the Basic Psychological Needs Theory (Deci & Ryan, 2012; Ryan & Deci, 2017), youth experience a sense of well-being within settings when they experience autonomy-support, opportunities for competency and mastery development, and a strong sense of connection (Fattore et al., 2016). Specific to sport, studies have shown that improvements in youth's needs satisfaction (i.e., autonomy-support, competence, connection) across a sport season are linked with corresponding improvements in youth well-being (Amorose et al., 2009).

Coaches play an important role within the youth sport context (e.g., Brown et al., 2017) for supporting youth's basic psychological needs in sport (Adie et al., 2012; Hodge et al., 2016) and, consequently, their mental health. In fact, among the various components of program quality (i.e., providing adult support and structure, fostering skill-building, expanding horizons, nurturing inclusion and acceptance, and preventing negative experiences), Bean and Forneris (2016) found that the degree to which coaches were able to provide support and a positive structure was most important for meeting/satisfying youth's basic psychological needs. Further, the benefits of autonomy-support (i.e., voice and choice) for nurturing youth mental health have been well-documented (e.g., Amorose & Anderson-Butcher, 2015; Bean & Forneris, 2019; Gill et al., 2017; Gillet et al., 2010) and linked with greater general well-being, positive affect, subjective vitality, life satisfaction, self-esteem, intrinsic motivation for sport, sport commitment, and enjoyment; and lower risk of burnout (Mossman et al., 2022).

A sense of competency is developed when individuals succeed at challenging tasks, attain desired outcomes, and/or feel a sense of mastery. Satisfying youth's needs for competency requires that the sport setting provides opportunities to

engage in activities that are challenging, yet achievable, and for coaches to take a developmental mastery-based approach, in which coaches approach and orient their players/team to sport competition (and the competitiveness of sport, more generally) in a way that values goals of fun, effort, dedication, and skill development alongside goals of winning. Similar to autonomy-supportive coaching, a developmental mastery-based approach (Nicholls, 1984; Ames, 1992; Smith et al., 1978; Smith & Smoll, 2011) has been identified as a particularly supportive strategy related to youth achievement, enjoyment and enthusiasm, intrinsic motivation, happiness, and long term engagement in sport (Breiger et al., 2015; Whitehead & Duda, 1998; McArdle & Duda, 2002; Smith et al., 2008). In turn, when youth's mastery-based motivation is nurtured by this supportive strategy, they consequently have more positive physical self-concepts. Likewise, a mastery-approach fosters youth motivations for relatedness in sports/physical activities and intrinsic motivations or enjoyment, both of which have been associated with more adaptive emotional functioning (Standage et al., 2012; Taylor et al., 2019). In contrast, establishing a sport setting that is focused almost solely on performance and winning, obtaining a specific reward, and/or protecting one's self-image has been shown to be highly detrimental on youth motivation and enjoyment; is associated with maladaptive emotional functioning, anxiety, dejection, anger, physical and emotional exhaustion; and can have a negative impact on youth mental health and subjective well-being (Gaudreau & Braaten, 2016; Appleton & Duda, 2016; Krommidas et al., 2016; Ruiz et al., 2021; Taylor et al., 2019).

Within the sport setting, the coach-athlete relationship and youth-peer relationships are two primary sources of connection that are responsible for fostering a sense of relatedness. In particular, the positive relationships and sense of relatedness developed with teammates and coaches are believed to support mental health through various important psychosocial processes, including social support, social





identity development, empowerment, and personal control (Eime et al., 2013; Strachan et al., 2009). To date, many of the studies on sport-related relationships and mental health have focused on burnout, a correlate of depression defined by an athlete's physical and mental/emotional exhaustion, feelings of devaluation, and reduced sense of accomplishment or achievement (Schonfeld & Bianchi, 2016). This research has shown that poor-quality coach-athlete relationships are associated with greater burnout (Cresswell & Eklund, 2007; Isoard-Gautheur et al., 2016) and coach-athlete closeness may be an essential factor for reducing the risk for burnout (McGee & DeFreese, 2019).

Team cohesion is considered a dynamic sense of connectedness among team members in which they are committed and stick together to reach team-shared objectives and goals, and when the team satisfies youth connection needs, including social support and friendship (Carron & Chelladurai, 1981). Much of previous research on team cohesion has looked at its impact on engagement and performance, with only a few studies examining its benefits on youth mental health and positive development. Among these few studies, team cohesion has been positively linked to youth mental toughness, defined as youth's self-confidence, focus, and motivation in stressful situations. Youth with mental toughness are more likely to view stressors as challenges rather than threats, feel they have the ability to successfully manage stressful situations, have high coping self-efficacy, and adopt more problem-focused coping strategies (Gu et al., 2015; Gu & Xue, 2022), all of which protect against stress and youth burnout (Wang et al., 2014). Team cohesion also has been shown to support psychological collectivism (Jackson et al., 2006) in which individuals regard themselves as valued members of a group, feel connected to the group and are inspired by and give priority to the norms, goals, and well-being of members of the group. In turn, psychological collectivism is related to effective

team functioning (Dierdorff et al., 2011) when teams provide greater emotional, informational, and appraisal support to teammates (Drach-Zahavy, 2004; Jackson et al., 2006), and youth experience higher levels of positive affect (Terry et al., 2001), engagement, and lower risk of dropout (Gu & Xue, 2022). Moreover, outside the sport literature, studies have shown that the group membership and social identity derived from team cohesion help protect against both the onset and reoccurrence of depression (Cruwys et al., 2013).

The literature review above points to the idea that while sport may be a protective factor against negative mental health outcomes, and also may facilitate areas of thriving, the context and environment surrounding sport are critical in understanding the impact of sport. As such, the current report aims to provide a comprehensive assessment of the relationship between sport participation and mental health, with a specific focus on adolescent girls. The report is subsequently divided into three distinct sections. Section I presents data on sport participation and clinical levels of mental health for 11,875 children. Data were extracted from the Adolescent Brain and Cognitive Development Study (Barch et al., 2018). Section II presents the results of a national survey of 2,956 girls and their parents that was designed specifically for this report. In this section we examine the relationship between sport participation and depression, anxiety, peer relationships, and meaning and purpose. To better understand the unique contribution of sport, we also compare sport participation to other organized activities (e.g., arts, academic, community, service, and faith programs). Additionally, to better understand the dose-response relationship between sport and mental health, we examine the number of hours a week of sport participation, number of sports played, and the number of years of sport participation. Further, we examine types of sport (contact level, team vs. individual, competition level) to better understand if some sports are more likely to promote positive mental health gains than others. Next, we examine the environmental factors associated with sport to determine the role of the sport environment. Specifically, we assess whether sport climate, autonomy-support, coach-athlete relationship, and social cohesion influence the relationship between sport participation and mental health. Finally, we examine if the relationship between sport and mental health change across key demographic groups (race/ethnicity, disability status, sexuality). In Section III we report data gathered for this report from focus groups with 45 girl sport participants across the United States. The focus group interviews centered on perceptions of mental health and the contribution of sport to mental health and well-being.

# Section I: Clinical Mental Health Rates and Sport Participation of Girls and Boys

## Design, Sample, and Data Analysis

The ABCD Study is a 10-year longitudinal study of brain and cognitive development in children beginning at ages 9–10 years across 21 U.S. sites with institutional review board approval provided by each site. The cohort was recruited to reflect the demographic and geographic diversity of American adolescents. Measures of behavioral and mental health functioning, substance use, and familial and environmental characteristics are collected annually or biannually (Barch et al., 2018). The ABCD protocol is a comprehensive set of in-person physical, cognitive, social, emotional, environmental, behavioral, and academic assessments, including neuroimaging and biospecimen collection. In-person assessments are completed annually (6–7 hours for the child, 3 hours for the parent) or biannually (imaging, bioassays) for 10 years. Participants complete a brief, mid-year phone interview (<https://nda.nih.gov/abcd>).

## Sample

The baseline ABCD sample includes 11,875 children aged 9–10 years. The sample is 52% female, 48% male; 52% white, 15% black/African American, 20% Hispanic, and 12% other racial groups; with family incomes ranging from \$0 to \$24,999 (15.1%), \$25,000 to \$99,999 (42.9%), and \$100,000 or more (42.0%). This study includes an analysis on all participants ( $N = 11,192$ ) who completed the baseline and first one-year follow-up.

## Major Independent Variables: Lifetime Sport Participation

Parents reported on their children's participation since birth in 23 different sports using the ABCD parent sports and activities involvement questionnaire. Lifetime sport participation (i.e., never participated versus has participated in at least one sport), number of sports (i.e., none, only one sport, two or more sports) and duration of sport participation (i.e., no participation, 1 to 2 years, 3 to 4 years, 5 or more years) were reported.

## Major Dependent Variables: Past-year Psychiatric Disorders

At baseline and follow-up sessions, parents reported on symptoms of adolescent anxiety (e.g., nervous, high-strung, fearful), depression (e.g., lacks energy, unhappy, sad), somatic complaints (e.g., headaches, nausea, body pains), social problems (e.g., not liked by other kids), thought problems (e.g., can't get mind off of certain thoughts), attention problems



(e.g., cannot pay attention for long), aggression (e.g., threatens people), attention deficit hyperactivity disorder (ADHD; e.g., acts impulsively and without thinking) and conduct problems (e.g., sets fires) using the Child Behavior Checklist (CBCL), which has been shown to be both a reliable and valid measurement tool (Achenbach & Rescorla, 2001). Following guidelines established by Achenbach and Rescorla (2001), clinically significant psychiatric disorders for each of nine scales were defined as t-scores (ranging from 50–100) that were 70 and higher (relative to a non-clinical sample). A binary summary variable was computed to indicate clinically significant anxiety, depression, somatic complaints, social problems, thought problems, attention problems, aggression, ADHD, and conduct disorders at both baseline and first follow-up: 1 (clinically significant) t-score greater or equal to 70 and 0 (not clinically significant) for t-score less than or equal to 69.

## Analysis

Descriptive statistics were calculated to assess the association between lifetime sport participation and past-year psychiatric disorders. Item missingness was handled using listwise deletion given that less than 10% of the sample was excluded due to missing data.



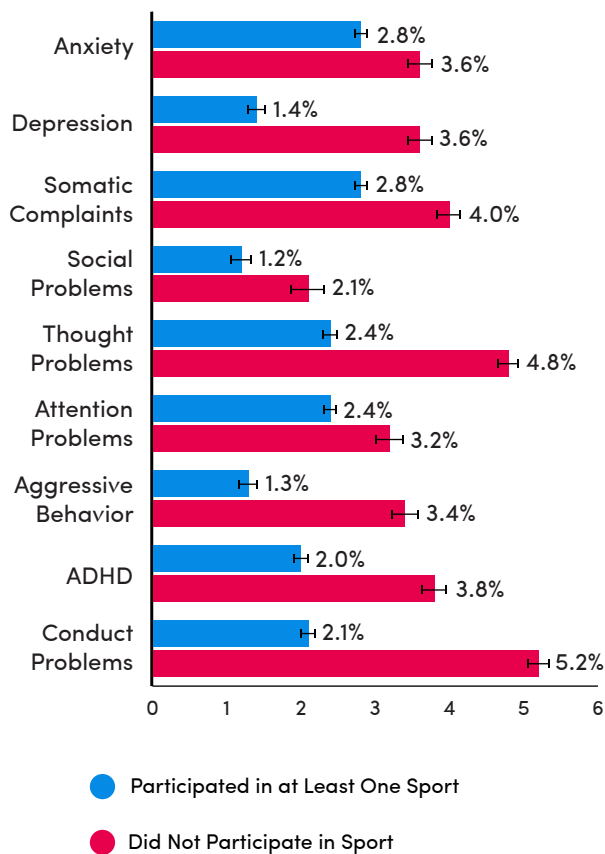
## Mental Health Problems and Sport Participation

### Section Summary

- Rates of clinical mental health disorders were 1.5 to 2.5 times higher (depending on the mental health condition measured) for those not participating in sport, when compared to those participating in sport.
- For those participating in multiple sports and those participating in sport for more than 5 years, the rates of mental health disorders were up to 5 times lower than those not participating in sport.

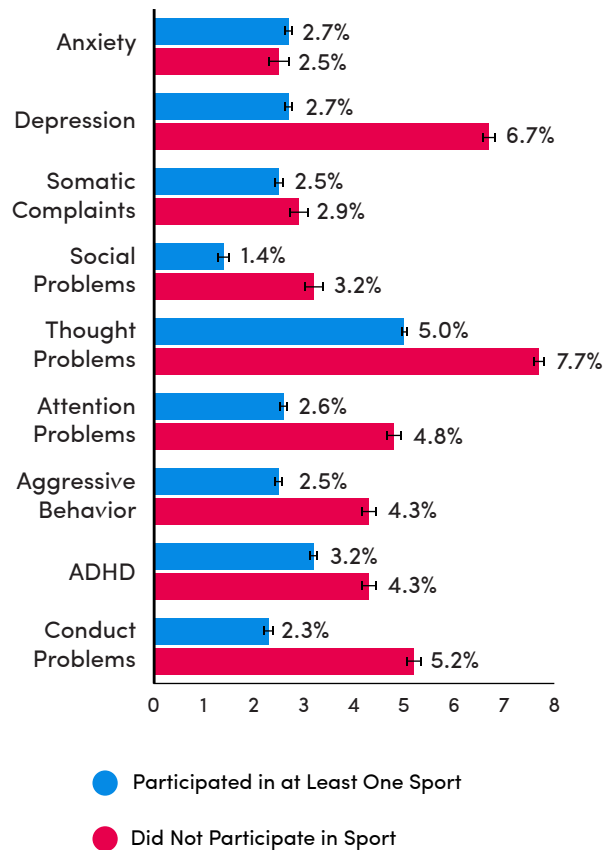
The data presented in Figure 1 (girls) and Figure 2 (boys) highlight the prevalence of clinical mental health disorders, as measured by the Child Behavior Checklist parent report, and compared against groups who participate in sport and

**Figure 1: Clinically Significant Psychological Disorders of Girls, by Sport Participation**



Note: Error bars that do not overlap reflect statistically significant differences.

**Figure 2: Clinically Significant Psychological Disorders of Boys, by Sport Participation**



Note: Error bars that do not overlap reflect statistically significant differences.

those who do not. Measures include depression, somatic complaints, social problems, thought problems, attention problems, aggressive behavior, ADHD, and conduct problems. Data indicate that engaging in sport has a positive impact on the mental health of both boys and girls, with results consistent across genders.

Clinically significant levels of depression, social problems, thought problems, aggressive behavior, and conduct problems were significantly lower among sport participants than among non-participants in both girls and boys. The clinical depression rate for girls who participated in sport was roughly 2.6 times lower than for non-participating girls (1.4% vs. 3.6%). Similarly, the clinical depression rate for boys who participated in sport was roughly 2.2 times lower than for non-participating boys (2.9% vs. 6.3%). Girls who participated in sport showed a clinical level of social problems roughly 1.6 times lower than non-participating girls (1.4% vs. 2.2%). For boys, the clinical level of social problems for sport participants was roughly 2.4 times lower than for non-participants (1.4% vs. 3.4%).

The clinical level of thought problems for girls who participated in sport was nearly 2 times lower than for non-participating girls (2.5% vs. 4.9%). The clinical level of thought problems for boys who didn't participate in sport was highest of any of the clinical disorders (7.7%). However, this rate was 1.5 times lower (5.1%) for boys who participated in sport. The clinical level of aggressive behavior for girls who participated in sport was roughly 2.5 times lower than for non-participating girls (1.3% vs. 3.2%); whereas the clinical level of aggressive behavior for boys who participated in sport was roughly 1.7 times lower than for non-participating boys (2.6% vs. 4.4%). The clinical level of conduct problems was roughly 1.9 times lower for both girls and boys who participated in sport when compared to their non-participating peers (2.1% vs. 3.9%).

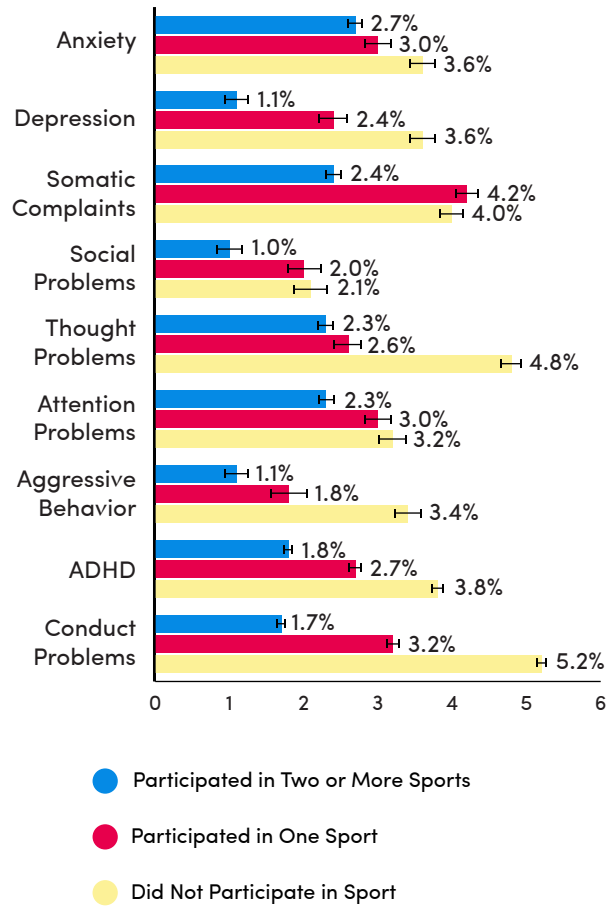
In addition to the above, clinically significant levels of somatic complaints and ADHD symptoms were significantly lower in girl sport participants when compared to girl non-participants. The clinical level of somatic complaints, which can be physical symptoms caused by psychological factors, was 1.4 times lower among girls who participated in sport than those who did not (2.9% vs. 4.1%). The clinical level of ADHD symptoms was roughly 1.9 times lower for girls who participated in sport when compared to their non-participating peers (2.1% vs. 3.9%).

### Mental Health Problems and Number of Sports Played

The data presented in Figure 3 (girls) and Figure 4 (boys, on following page) highlight the prevalence of clinical mental health disorders, as measured by the Child Behavior Checklist parent report, with comparisons between number of sports played. Overall, trends were similar for boys and girls, with data supporting the finding that participation in a greater number of sports had larger benefits for mental health.



**Figure 3: Clinically Significant Psychological Disorders of Girls, by Number of Sports**

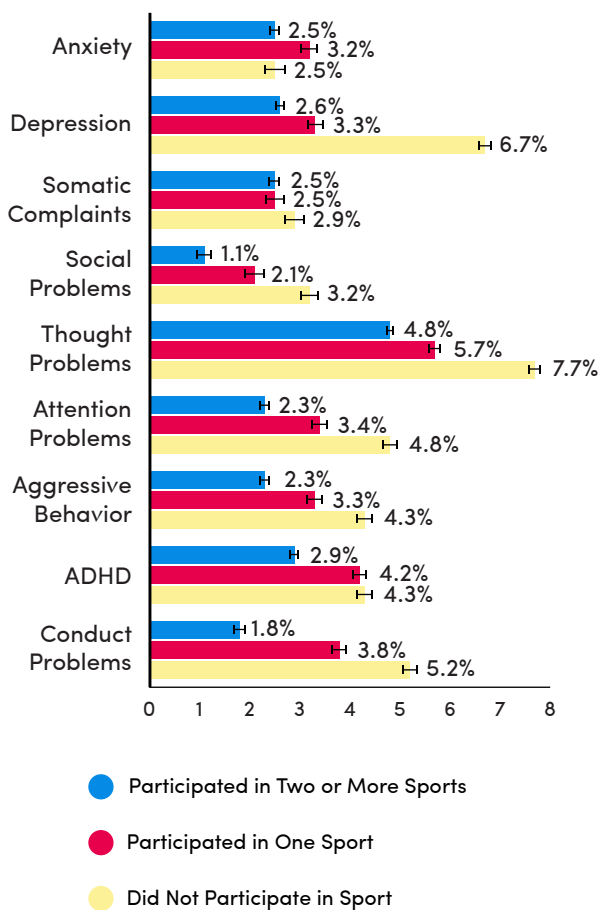


Note: Error bars that do not overlap reflect statistically significant differences.

For girls, an increase in the number of sports played was associated with decreases in clinical levels of depression, somatic complaints, social problems, thought problems, aggressive behaviors, ADHD symptoms, and conduct problems (see Figure 3). In examining girls who participated in at least two sports, there was a substantial impact on mental health when compared to non-sport participants. The rate of clinical depression was 3.3 times lower for girls who participated in at least two sports than for those who did not participate in sport (1.1% vs. 3.6%). Similar decreases existed for clinical levels of somatic complaints (2.5% vs. 4.1%; 1.6 times lower), social problems (1.2% vs. 2.2%, 1.8 times lower), thought problems (2.4% vs. 4.9%, 2 times lower), aggressive behavior (1.2% vs. 3.3%, 2.8 times lower), ADHD symptoms (1.9% vs. 3.9%, 2 times lower), and conduct problems (1.8% vs. 5.0%, 2.8 times lower) when comparing girls who participate in two or more sports to girls who do not participate in sport.

Likewise, for boys, an increase in the number of sports played was associated with decreases in clinical levels of depression, social problems, thought problems, attentional problems, aggressive behaviors, ADHD symptoms, and conduct problems (see Figure 4). The rate of clinical depression was 2.3 times lower for boys who participated in at least two sports than for their non-participating peers (2.8% vs. 6.3%). Similar decreases existed for clinical levels of social problems (1.2% vs. 3.4%, 2.8 times lower), thought problems (4.9% vs. 7.7%, 1.6 times lower), attentional problems (2.3% vs. 4.8%, 2.1 times lower), aggressive behavior (2.3% vs. 4.4%, 1.9 times lower), ADHD symptoms (2.9% vs. 4.2%, 1.4 times lower), and conduct problems (2.0% vs. 5.2%, 2.6 times lower) when comparing boys who participate in two or more sports to those who do not participate in sport.

**Figure 4: Clinically Significant Psychological Disorders of Boys, by Number of Sports**

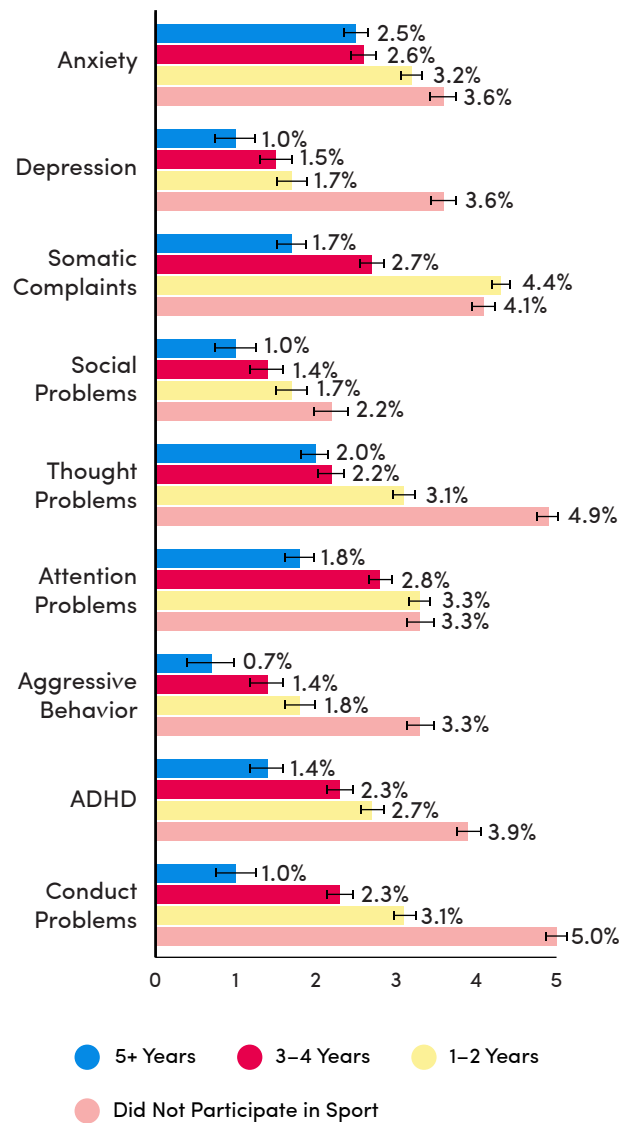


Note: Error bars that do not overlap reflect statistically significant differences.

## Mental Health Problems and Number of Years of Sport Participation

The data presented in Figure 5 (girls) and Figure 6 (boys, on following page) highlight the prevalence of clinical mental health disorders, as measured by the Child Behavior Checklist parent report with comparisons between number of years each child participated in sport. Overall, trends were similar for boys and girls, with data supporting the finding that longer participation in sport had larger benefits for mental health.

**Figure 5: Clinically Significant Psychological Disorders of Girls, by Years of Sport Participation**



Note: Error bars that do not overlap reflect statistically significant differences.

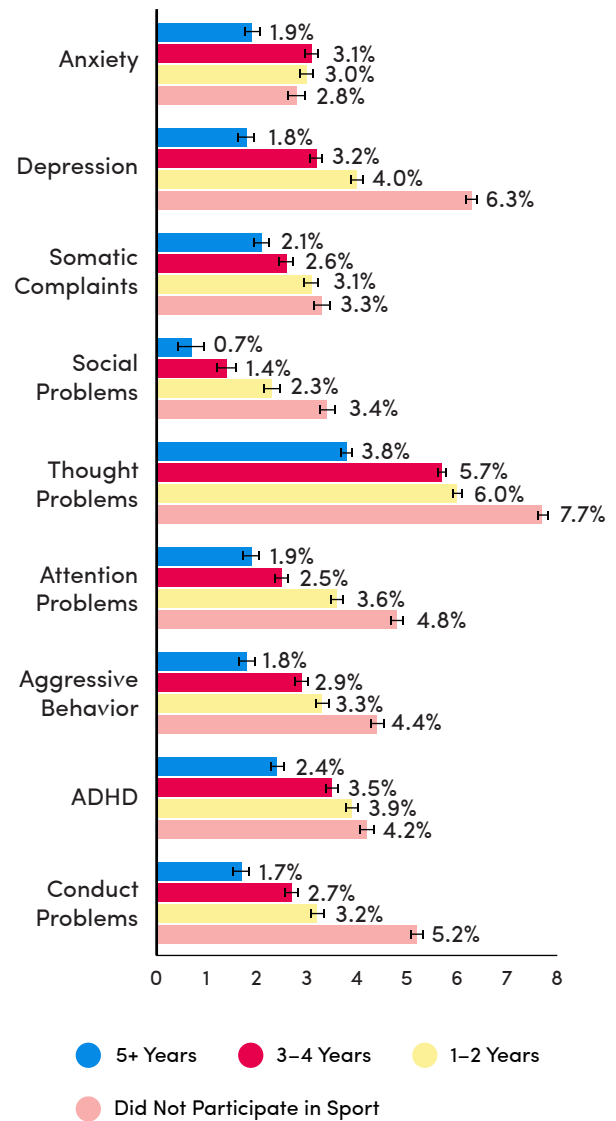
For girls, an increase in the number of years they participated in sport was associated with decreases in clinical levels of depression, somatic complaints, thought problems, attention problems, aggressive behaviors, ADHD symptoms, and conduct problems (see Figure 5). The largest decreases in clinical mental health were seen for girls participating in sport for at least five years. When compared to non-sport participants, girls participating for five years or more were 5 times less likely to have clinical levels of conduct problems (1.0% vs. 5.0%), 4.7 times less likely to have aggressive behavior problems (0.7% vs. 3.3%), 3.6 times less likely to be clinically depressed (1.0% vs. 3.6%); 2.8 times less likely to have clinical levels of ADHD symptoms (1.4% vs. 3.9%), 2.4 times less likely to have clinical levels of thought problems (2.0% vs. 4.9%), 2.4 times less likely to have somatic complaints (1.7% vs. 4.0%), and 1.8 times less likely to have clinical levels of attention problems (1.8% vs. 3.3%).

Likewise, for boys, an increase in the number of years they participated in sport was associated with decreases in clinical levels of depression, social problems, thought problems, attention problems, aggressive behaviors, ADHD symptoms, and conduct problems (see Figure 6). The largest decreases in clinical mental health were seen for boys participating in sport for at least five years. When compared to non-sport participants, boys participating for five years or more were 4.8 times less likely to have clinical levels of social problems (0.7% vs. 3.4%); 3.5 times less likely to be clinically depressed (1.8% vs. 6.3%); 3.1 times less likely to have clinical levels of conduct problems (1.7% vs. 5.2%); 2.5 times less likely to have clinical levels of attention problems (1.9% vs. 4.8%); 2.4 times less likely to have clinical levels of aggressive behavior (1.8% vs. 4.4%); 2 times less likely to have clinical levels of thought problems (3.8% vs. 7.7%); and 1.8 times less likely to have clinical levels of ADHD symptoms (2.4% vs. 4.2%).

The data presented above align with previous research that shows a positive correlation between sport participation and mental health in children. Notably, these data help support a dose-response relationship between sport participation, as those with the longest sport engagement, and those participating in the highest number of sports, reported the lowest incidence of mental health disorders, a finding also noted in previous studies (Bowker, 2006; Zarrett et al., 2009; Zarrett, Veliz, & Sabo, 2018; Zarrett & Veliz, 2021).

A surprising finding was that clinical levels of anxiety were not significantly different between sport participants and non-sport participants, as well as across various dosages of sport. While previous research has suggested that the benefits of sport differ across sport type (Schinke & McGannon, 2015; Zarrett, Veliz, & Sabo, 2018; Zarrett & Veliz, 2021), more research is needed to better understand the types of sport and conditions within sport that may support, or impede, the mental health of young people. For example, anxiety might be higher in individual sports (Pluhar et al., 2019) that have a greater spotlight effect, and thus higher amounts of perceived stress for those participating. The type and level of competition could also increase anxiety

**Figure 6: Clinically Significant Psychological Disorders of Boys, by Years of Sport Participation**



Note: Error bars that do not overlap reflect statistically significant differences.

(or other symptoms or mental ill-health) if athletes perceive a high level of pressure to perform. In the following section, we report results from an original study that examined contextual factors that help explain the relationship between mental health and sport participation.

# Section II: Understanding the Critical Impact of Sport Participation on the Mental Health of Girls

## Design, Sample, and Data Analysis

### Design

The Women’s Sports Foundation (WSF) commissioned a national survey (in partnership with YouGov) to explore both participation rates in sport and how sport participation influenced mental health among female adolescents. Data were collected between June 29 and July 13, 2023. The survey was carried out by YouGov and conducted with its online panel of respondents. In total 2,956 parents and 2,956 girls ages 12–17 were surveyed, with data weighted to reflect U.S. Census proportions that are representative of children ages 12–17. The survey was designed with the following research questions guiding the analyses:

- What is the impact of sport on mental health benefits for girls?
- How do mental health outcomes for girls in sport compare to those of girls in other extra-curricular activities?
- What are the factors that impact the relationship between sport participation and mental health for girls in sport? Are there scenarios where sport could negatively impact mental health?
- How do mental health outcomes associated with sport participation differ by age, race, socioeconomic status, abilities, sexuality, identity, and other factors?
- What resources, tools, or specific kinds of education are needed for girls at all levels to maximize positive mental health outcomes associated with their sport participation?

### Operational Definitions

1. The current study examined girls’ experiences in sport. Inclusion criteria, and thus, the definition of girls in the current study was female sex assigned at birth and any identified gender identity OR male sex assigned at birth and gender identity selected as girl.
2. In the current study sport was defined as an organized activity for which there is a coach, program leader, or instructor and there are regularly scheduled practices, training sessions, or competitions.
3. In the current study, disability was defined as parents identifying their child as a D/deaf or disabled person, or having a long-term health condition (i.e., physical, visual, auditory, cognitive/mental, emotional).



### Sample

The sample includes 2,956 girls aged 12–17 and a parent/guardian of each child participant. The sample is 51% White, 14% Black/African American, 25% Hispanic, and 10% other racial groups. Ninety-two percent of the sample reported not having a disability, whereas 7% reported a disability and 1% reported preferring not to say. Disability status was assessed by using a question modified from the Behavioral Risk Factor Surveillance System and asking parents if their child identified as D/deaf or disabled, or had a long-term health condition (i.e., physical, visual, auditory, cognitive/mental, emotional, or other) (Centers for Disease Control and Prevention, 2018). Additionally, 85% of the children in the sample reported identifying as straight/heterosexual, 9% reported identifying as LGBTQ+, and 6% reported they did not know or preferred not to say.

In terms of family/household income, 28% of the sample reported \$0 to \$49,999, 26% \$50,000 to \$99,999, and 45% \$100,000 or more. For parent education, 17% of the sample reported high school or less, 32% some college, 30% a 4-year college degree, and 22% a postgraduate degree.

In terms of geography, 39% of participants lived in the South, 24% in the West, 21% in the Midwest, and 16% in the East; 45% lived in suburbs, 31% in cities/urban areas, 15% in rural areas, and 8% in towns.

Overall, 52% of the sample were current sport participants, 17% had previously participated in sport but no longer did, and 32% of the sample had never participated in sport.

## Main Variables

### *Major Independent Variables: Lifetime Sport Participation*

Parents reported their children's history of participation in sport since birth. A matrix form was used in which parents listed all sports the child participated in throughout the lifetime; the age of the child when each sport was started, the age of the child when she stopped participating in the sport, the average number of hours a week the child spent in activities (practices, games, etc.) for that sport, and the highest competition level achieved. Data were collected on both past sports and current sports, with current sports being defined as having participated in the last year and planning to participate again. Child respondents indicated what their primary sport was, and, if no primary sport was identified, what sport they were currently participating in.

Lifetime sport participation was categorized into current, past, and never participants, with the number of sports, and the duration (in years) of sport involvement also being calculated. The numbers of hours a week spent in sport participation for current athletes also was calculated.

### *Major Dependent Variables: Mental Health and Thriving*

The Patient-Reported Outcomes Measurement Information System (PROMIS; Cella et al., 2010) was used to collect data on markers of mental health: depression, and anxiety; as well as markers of thriving: peer relationships and meaning and purpose. PROMIS measures are validated, reliable measures with available nationally representative and normative data. For each form, we used a version of the brief pediatric self-report survey. Analyses of PROMIS measures use standardized t-scores, with the population average representing a score of 50 points with a standard deviation of 10. Thus, each point difference between groups represents 1/10 of a standard deviation difference.

For depression and anxiety measures, girls with scores 1 standard deviation (SD) higher than average (i.e., a score of 60 or greater) were classified as *"moderate-to-high."* In practical terms, this group represents participants with depression or anxiety scores that are higher than approximately 84% of the U.S. population. The proportion of girls falling within this range was used in analyses.

For peer relationships and meaning and purpose, girls with scores 0.5 SDs higher than average (i.e., a score of 55 or greater) were classified as *"moderate-to-high."* We lowered the threshold from one SD to 0.5 SD for these measures due to the known ceiling effect of the short-form measures of both constructs (DeWalt et al., 2013), as well as literature

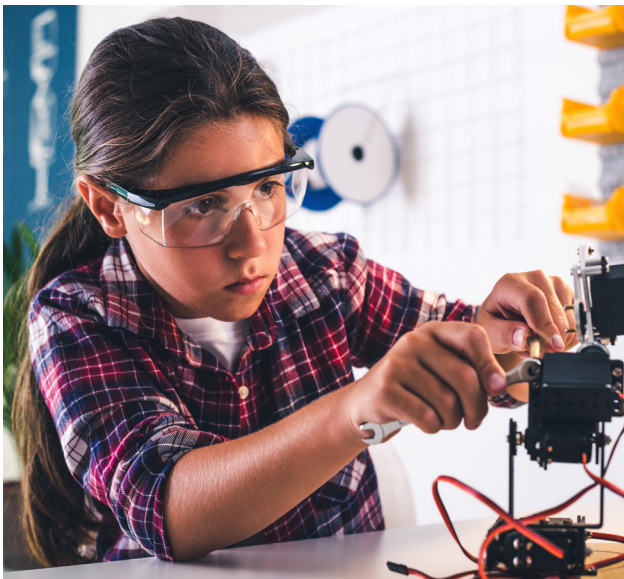


that suggests differential pathways and timelines to purpose development (Burrow, 2015). In practical terms, this group represents participants with peer relationship and meaning and purpose scores that are higher than approximately 67% of the U.S. population. The proportion of girls falling within this range was used in analysis.

#### *Major Comparison Variables: Lifetime Non-Sport Extra-Curricular Activities*

Similar to sport participation, parents/guardians reported on their children's history of non-sport extra-curricular activities since birth. Parents/guardians selected from a range of activities: music, acting/singing/performing arts, dance, girl scouts, community service, religious activities/education, academic enrichment/tutoring, art, and school clubs. A matrix form was then presented in which parents listed the age of the child when the activity was started, the age of the child when the activity was stopped, and the average number of hours a week the child spent in the activity. Data were collected on both past activities and current activities.

Lifetime non-sport activity participation was categorized into the number of activities, and the duration (in years) of activity involvement, and the number of hours a week spent in current activity participation.



#### *Major Moderating Variables: Indicators of the Sport Environment*

To better understand how the conditions of sport affected mental health, participants' perceptions of the motivational climate of their sport, the amount of autonomy-support they received, their relationship with their coach, and the level of social cohesion on the team were measured.

The motivational climate scale for youth sports (Smith et al., 2008) assesses two different motivational climates in youth sport settings. The first is a learning or mastery climate, which focuses on individual effort, improvement, and development over time. The second is an ego-involved climate, which focuses on outcomes (i.e., winning as primary) and social comparisons (i.e., who is the best). In the current study, we used the 6-item ego-involved sub-scale, herein referred to as a "performance climate." Lower scores on this variable indicate a more developmentally favorable sport environment.

Autonomy, or the ability to have voice and choice, was measured using the 5-item autonomy satisfaction sub-scale of the Psychological Need States in Sport Scale (Bhavsar et al., 2020). This measure has been shown to be both valid and reliable in previous research.

The coach-athlete relationship questionnaire (Jowett & Ntoumanis, 2004) is a valid and reliable tool that measures the nature of the coach-athlete relationship across three domains: closeness, commitment, and complimentary. The 4-item closeness scale was used in the current study.

The Youth Sport Environment Questionnaire (Eys et al., 2009) is a valid and reliable measure of group cohesion across two domains: task and social cohesion. The 6-item social cohesion sub-scale was used in the current study.

For all sport environment items, scores were separated into categories of those who reported high (+1 SD above the mean), medium (within  $\pm 1$  SD of the mean), and low (-1 SD below the mean) scores. Due a positively skewed distribution of the coach-athlete relationship questionnaire, the cut-point was set at 0.6 SD above the mean as opposed to 1 SD above the mean.

#### **Analysis**

Descriptive statistics were calculated to assess the association between sport participation and mental health outcomes among the girls included in the sample. Percentages, means, and 95% confidence intervals were calculated to assess differences between key groups. All analyses incorporated weights to reflect U.S. Census proportions that are representative of children ages 12-17.

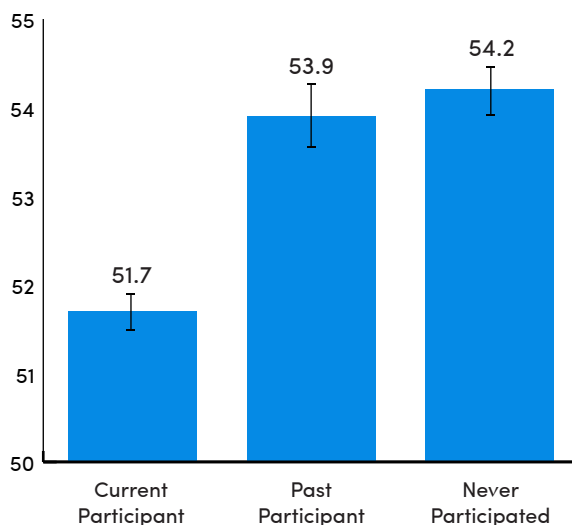
## Impact of Sport on Mental Health Outcomes in Adolescent Girls

### Section Summary

- The odds of having a moderate-to-high depression or anxiety score were approximately twice as high for girls who never participated in sport as for girls who currently participate in sport.
- The odds of having a moderate-to-high meaning and purpose score were approximately 1.5 times higher for girls who currently participate in sport than for girls who never participated in sport.
- The odds of having a moderate-to-high peer-relationship score were approximately 1.5 times higher for girls who currently participate in sport than for girls who never participated in sport.

Aligned with previous research that has examined the relationship between sport and mental health (Easterlin et al., 2019; Graupensperger et al., 2021; Murray et al., 2021), girls in the study sample who currently participate in sport had significantly lower depression and anxiety scores as well as significantly higher meaning and purpose and peer relationships scores when compared to girls who had previously participated in sport and girls who had never participated in sport.

**Figure 7: Depression T-Scores by Involvement in Sport**



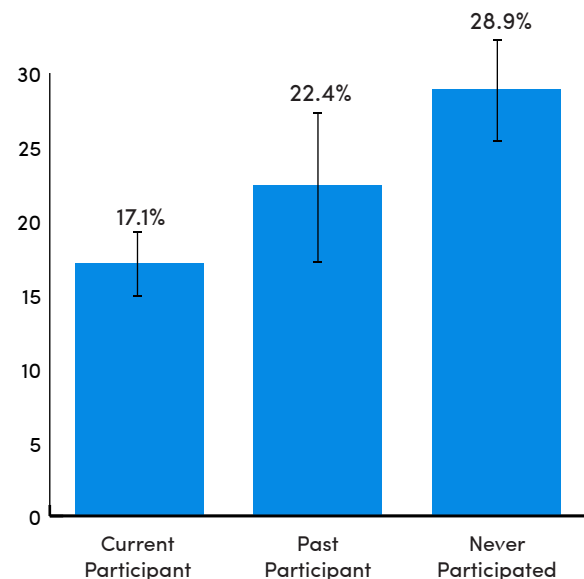
*Note: Statistical significance of 95% confidence exists between current participants and both past participants and those who never participated in sport.*

Figure 7 shows the standardized score for depression for the full sample of girls in the current study ( $N = 2,956$ ). Depression scores for girls who currently participate in sport are significantly lower than scores for those who previously participated in sport and those who never participated in sport. Figure 8 shows the percentage of girls with moderate-to-high depression scores. For current sport participants, 17.1% of the sample had depression scores in the moderate-to-high range, whereas 22.4% of previous sport participants and 28.9% of girls who never participated in sport did.

Figure 9 (on following page) shows standardized scores for anxiety also were lower for girls who currently participate in sport than for those who previously participated in sport and those who never participated in sport. Similarly, Figure 10 (on following page) shows that for current sport participants, 11.2% of the sample had anxiety scores in the moderate-to-high range, whereas 14.2% of previous sport participants and 20.7% of girls who never participated in sport had moderate-to-high anxiety scores.

These current findings are consistent with a recent meta-analysis that found a negative correlation between depression and sport involvement, as well as between anxiety and sport involvement, in samples of over 65,000 and 43,000 youth aged 12–18 years old (Panza et al., 2020). These data provide strong evidence of sport as a protective factor against the ill-effects of anxiety and depression symptoms, struggles

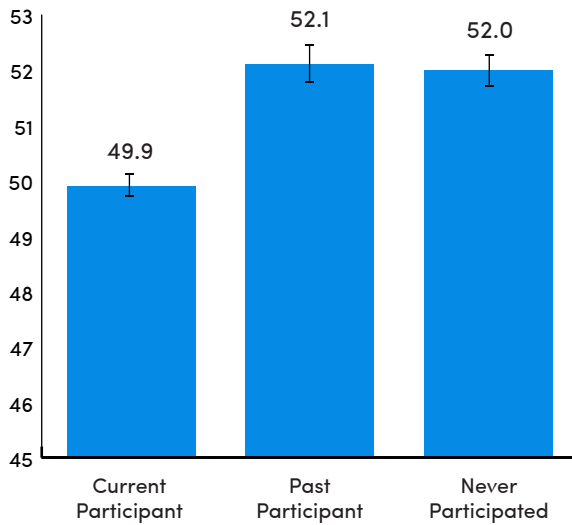
**Figure 8: Percentage of Girls with Moderate-to-High Depression T-Scores, by Involvement in Sport**



*Note: Statistical significance of 95% confidence exists between current participants and those who never participated in sport.*

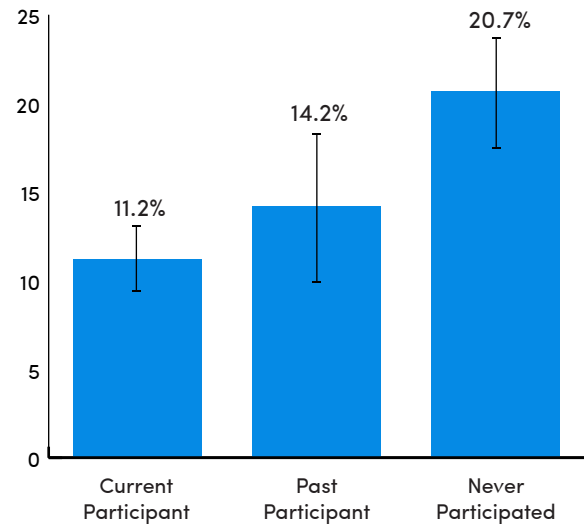


**Figure 9: Anxiety T-Scores by Involvement in Sport**



*Note: Statistical significance of 95% confidence exists between current participants and both past participants and those who never participated in sport.*

**Figure 10: Percentage of Girls with Moderate-to-High Anxiety T-Scores, by Involvement in Sport**



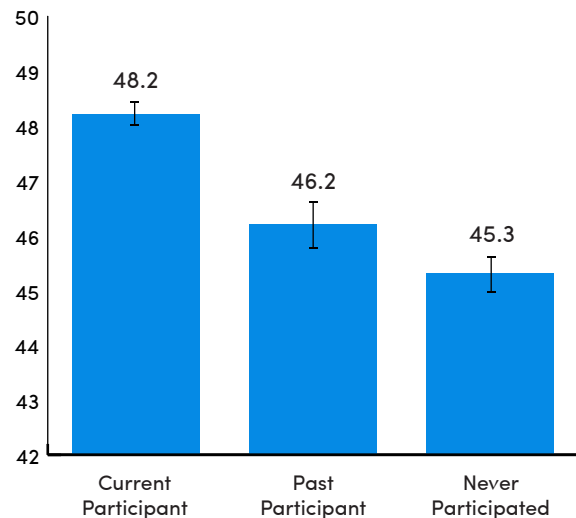
*Note: Statistical significance of 95% confidence exists between current participants and those who never participated in sport.*

adolescents often face (Teubert & Pinquart, 2011). Yet, the absence of negative symptoms is not, in and of itself, indicative of well-being or positive mental health. Social support, social role satisfaction (Cruwys et al., 2013), and a strong sense of purpose (Bronk et al., 2009; Kashdan & McKnight, 2009) are thought to be indicators of thriving in young people and are important to consider when accounting for holistic representations of mental health and well-being.

To better understand if sport contributed to thriving, we also examined differences in meaning and purpose and peer relationships. Figure 11 shows that the standardized scores for meaning and purpose were significantly higher for girls currently participating in sport than for previous sport participants and girls who never participated. Similarly, Figure 12 (on following page) shows that 31.8% of girls currently involved in sport fell into the moderate-to-high category of meaning and purpose, whereas only 26.5% of previous sport participants and 24.3% of never sport participants fell into that category.

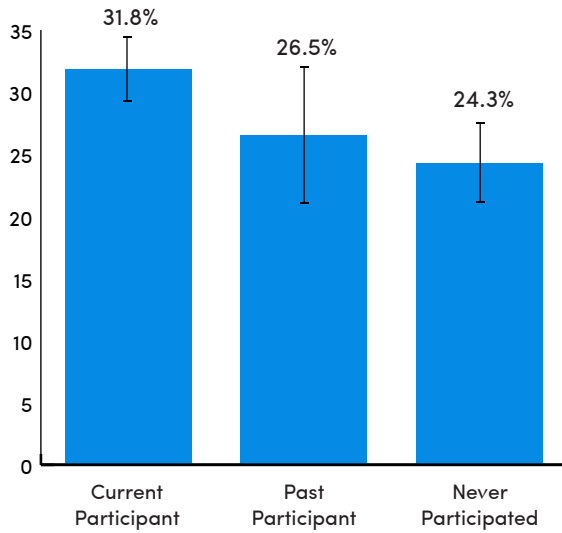
Similar results were found for peer relationships, with Figure 13 (on following page) showing that the standardized scores for peer relationships were significantly higher for current sport participants than previous sport participants or those who never participated in sport. Further, as shown in Figure 14 (on following page), 23.2% of girls who currently participate in sport can be classified in the moderate-to-high category in peer relationships, which was significantly more than the 14.8% of girls who met this criterion in the never participated category.

**Figure 11: Meaning and Purpose T-Scores by Involvement in Sport**



*Note: Statistical significance of 95% confidence exists between current participants and both past participants and those who never participated in sport.*

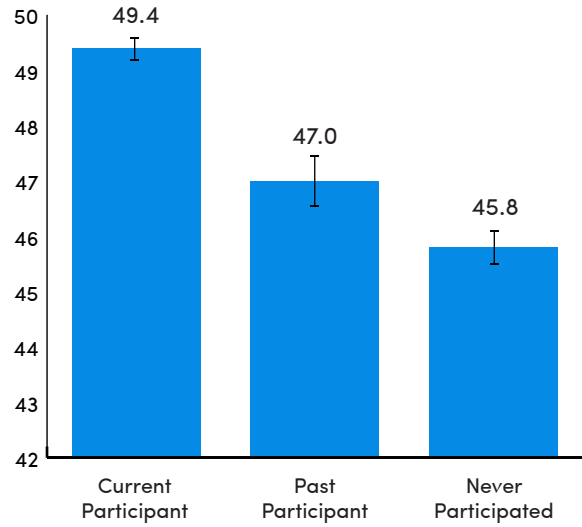
**Figure 12: Percentage of Girls with Thriving Meaning and Purpose T-Scores, by Involvement in Sport**



*Note: Statistical significance of 95% confidence exists between current participants and those who never participated in sport.*

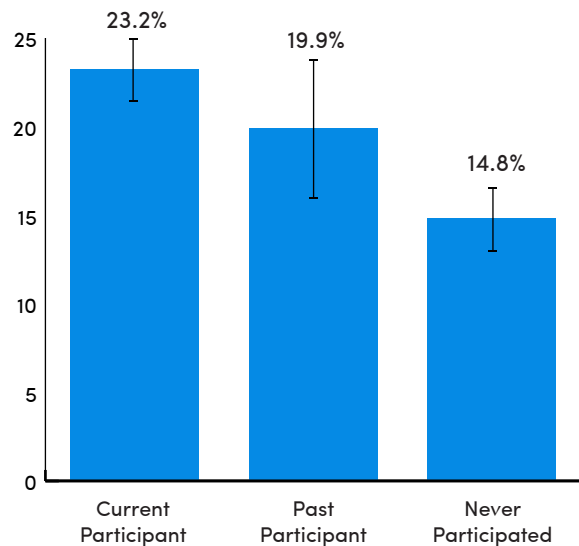
These data suggest that sport contributes multiple components of mental health for adolescent girls. Previous research has shown that physical activity is a key contributor to mental health, but sport might have benefits above and beyond the benefits accrued during physical activity (Eime et al., 2013). Notably, sport may provide social support, belonging, and a sense of community that has mental health benefits for young people. To test the contribution of sport, it is important to examine if sport affects mental health above and beyond other positive development contexts that also provide social support, belonging, and a sense of community. While youth sport is generally touted as a tool for positive developmental outcomes, research attempting to apply positive youth development to sport contexts has been mixed (Jones et al., 2011; Holt et al., 2017; Whitley et al., 2019). Thus, the next section examines the contribution of sport to mental health, when compared with similar doses of other positive developmental activities.

**Figure 13: Peer Relationships T-Scores by Involvement in Sport**



*Note: Statistical significance of 95% confidence exists between all categories.*

**Figure 14: Percentage of Girls with Thriving Peer Relationships T-Scores, by Involvement in Sport**



*Note: Statistical significance of 95% confidence exists between current participants and those who never participated in sport.*

## Comparisons of Sport and Other Extra-Curricular Activities on Mental Health Outcomes

### Section Summary

- When comparing the number of activities, number of years engaged, and hours a week of participation, girls who participate in sport have lower levels of depression and anxiety and higher levels of peer relationships and meaning and purpose than girls who only participate in non-sport extracurricular activities.
- For girls participating in sport approximately 2 hours a day, peer relationship and meaning and purpose scores were the highest.
- Girls who participate in sport are also more likely to participate in other clubs/activities than those who don't participate.

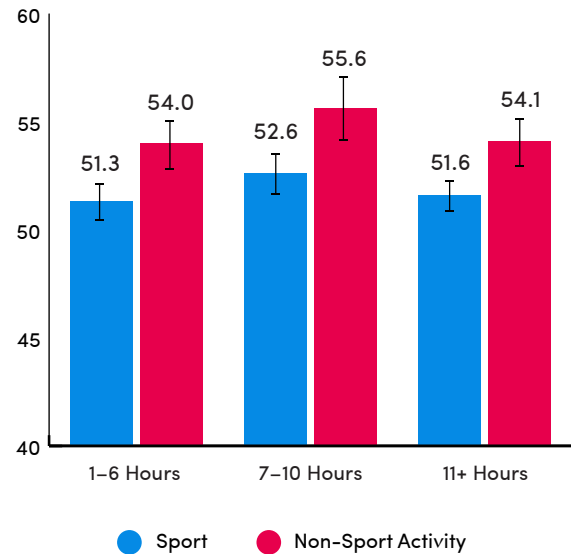
Findings in this study suggest that sport might provide additional benefits above and beyond participation in non-sport extra-curricular activities. Organized sport programming is a primary setting for youth to acquire the recommended levels of 60 minutes or more of daily moderate-to-vigorous physical activity. In turn, several reviews have indicated that engaging in regular daily physical activity is protective against depression and anxiety symptoms (Ahn & Fedewa, 2011; Biddle et al., 2019) and can significantly reduce depression, anxiety, psychological stress, and emotional disturbances in both clinical and nonclinical samples of children and adolescents.

Thus, when comparing the number of hours per week spent in sport vis-à-vis other extra-curricular activity (e.g., music, art, school clubs, girl scouts, theatre, etc.), the added benefit of vigorous physical activity for many sport participants may help explain why sport participants report significantly lower levels of depression (Figure 15) and anxiety (Figure 16) than those who never participated in sport.

Similar results were noted when comparing the number of years of participation, and the number of activities in which participants were involved (see Figures 17 and 18, on following page, for comparisons of depression scores; and Figures 19 and 20, on following page, for comparison of anxiety scores).

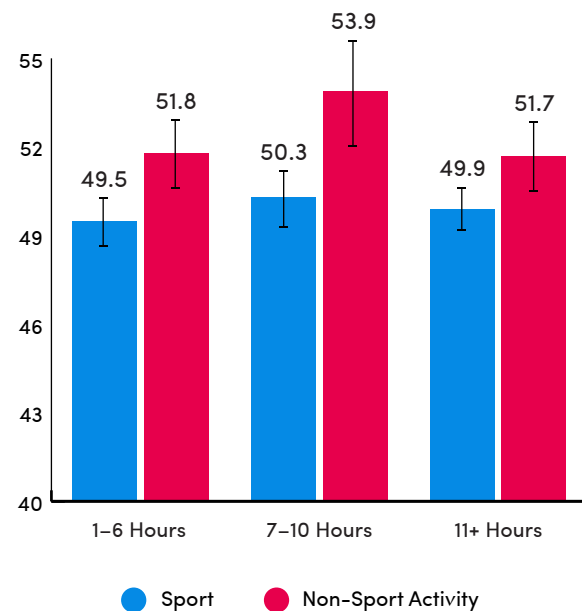
Data also suggest sport s a key role in promoting thriving in adolescent girls. For example, girls who have participated in sport 5 or more years reported significantly higher scores for peer relationships than girls participating 4 years or less (Figure 21, on page 29). Similarly, girls participating in sport 11 or more hours per week reported significantly higher peer relationship scores than girls participating 6 hours or less (Figure 22, on page 29).

**Figure 15: Depression T-Scores by Total Number of Hours per Week Involved in Sport and Non-Sport Activities**



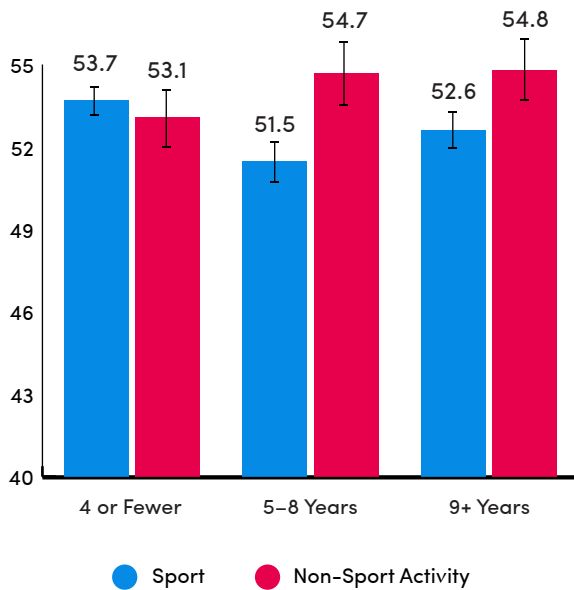
*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at all levels of involvement.*

**Figure 16: Anxiety T-Scores by Total Number of Hours per Week Involved in Sport and Non-Sport Activities**



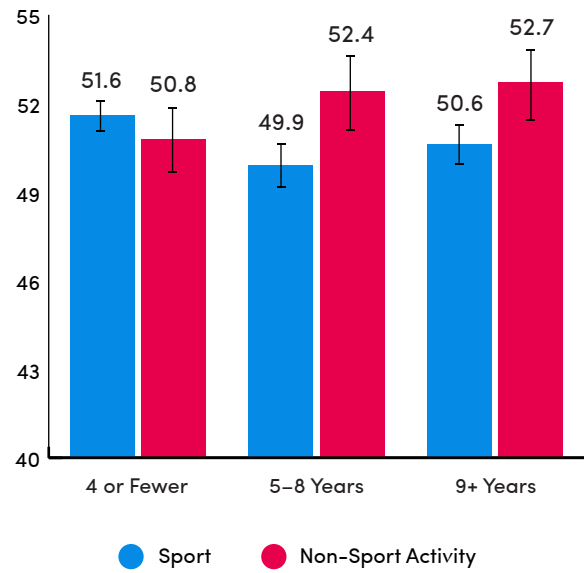
*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at all levels of involvement.*

**Figure 17: Depression T-Scores by Years Involved in Sport and Non-Sport Activities**



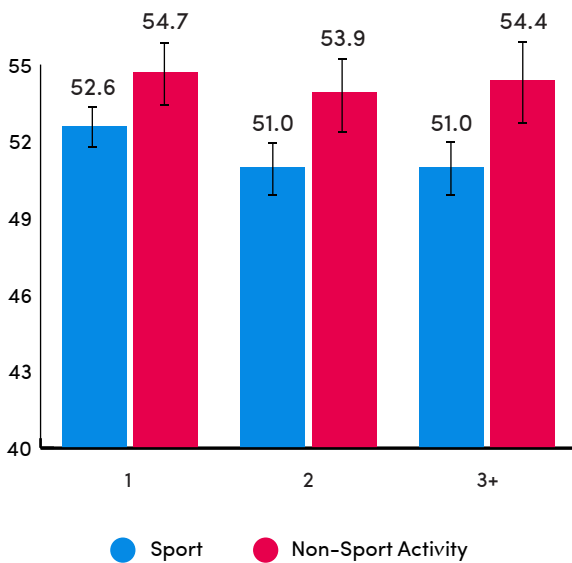
*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at 5-8 years and 9+ years of involvement, as well as between sport participants at 4 or fewer years and those at 5-8 years and 9+ years of involvement.*

**Figure 19: Anxiety T-Scores by Years Involved in Sport and Non-Sport Activities**



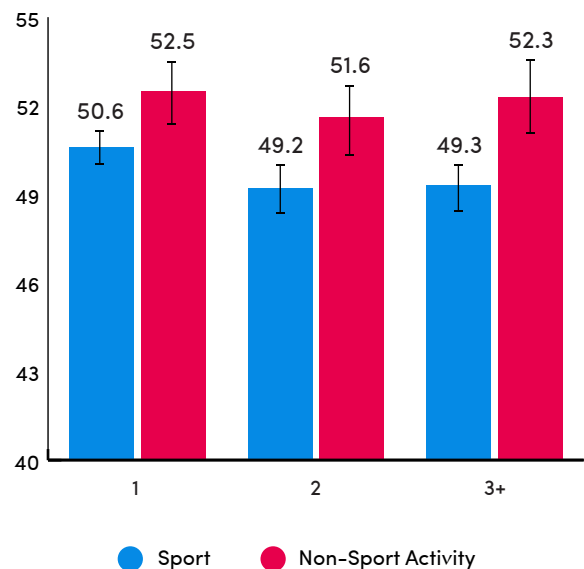
*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at 5-8 years and 9+ years of involvement; as well as between sport participants at 5-8 years and those at 4 or fewer years of involvement.*

**Figure 18: Depression T-Scores by Current Number of Sport and Non-Sport Activities**



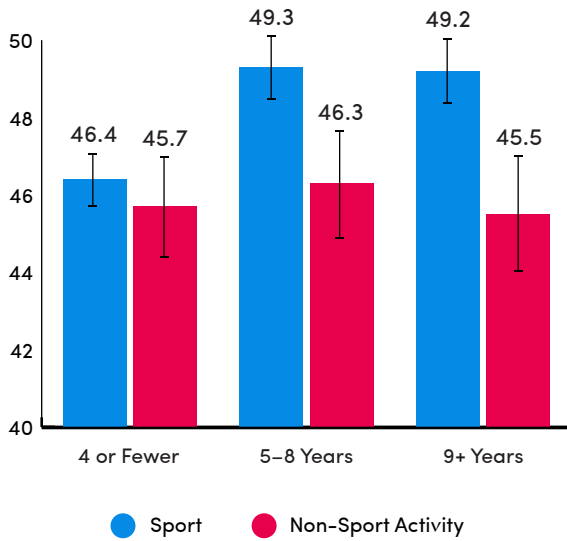
*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants for those who participate in 2 or 3+ sports/activities.*

**Figure 20: Anxiety T-Scores by Current Number of Sport and Non-Sport Activities**



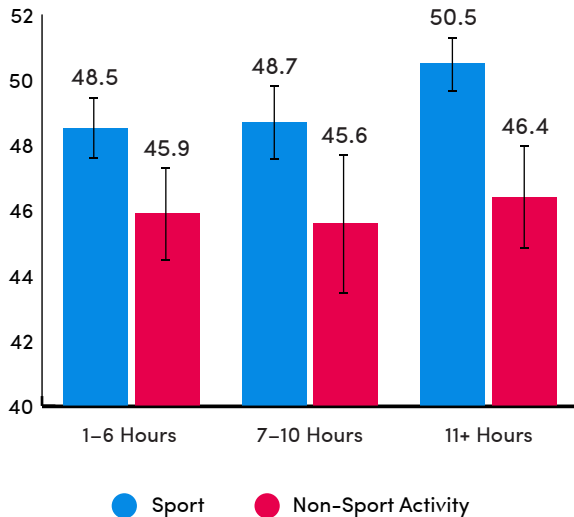
*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at all levels of involvement.*

**Figure 21: Peer Relationships T-Scores by Years Involved in Sport and Non-Sport Activities**



*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at 5-8 years and 9+ years of involvement; as well as between sport participants at 4 or fewer years and those at 5-8 and 9+ years of involvement.*

**Figure 22: Peer Relationships T-Scores by Total Number of Hours per Week Involved in Sport and Non-Sport Activities**



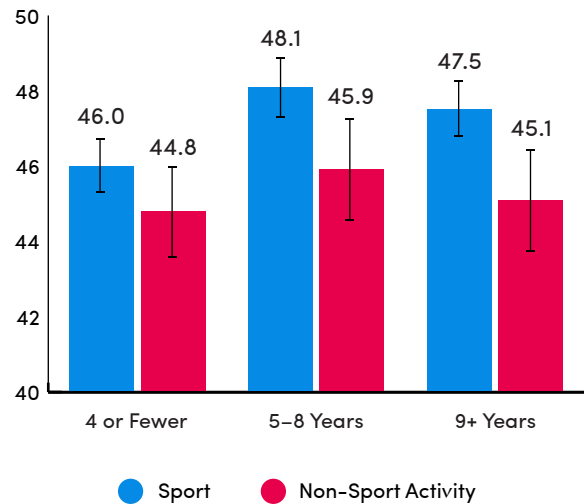
*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at 1-6 and 11+ hours per week; as well as between sport participants at 11+ hours per week and those at 1-6 hours per week.*

Consistent results were seen for meaning and purpose, with girls participating in sport for 5-8 years and 9+ years reporting significantly higher scores than girls participating four years or less (Figure 23) and girls participating in sport for more than 11 hours a week reporting significantly higher levels of meaning and purpose than those participating 10 hours or less per week (Figure 24, on following page).

When examining the number of years of participation (Figures 21, 23), the number of hours per week (Figures 22, 24), and the number of sports/activities participated in (Figures 25, 26, on following page) for current sport and non-sport participants with comparable numbers of extracurricular activities, current sport participants reported significantly higher peer relationships and meaning and purpose in nearly every category.

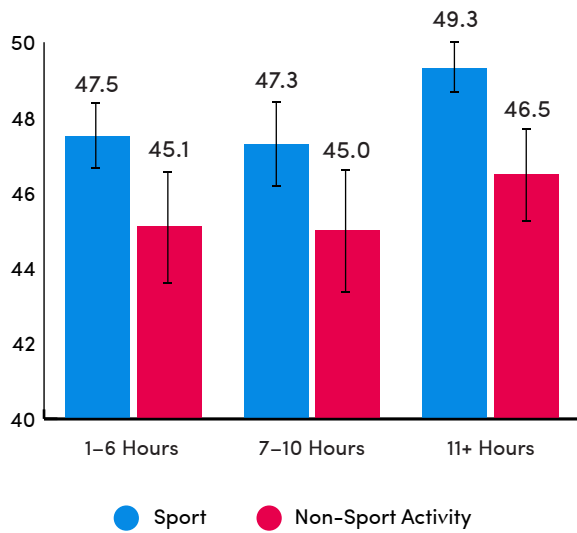
These results are supported by previous research that has shown that positive peer relationships within the sporting environment are associated with motivation, perceived competence, and enjoyment (Smith et al., 2006), all of which might contribute to the mental health benefits noted in the data above. Further, sport may promote feelings of meaning and purpose by facilitating supportive relationships (Fraser-Thomas et al., 2008) that are cultivated through teamwork and growth in interpersonal skills (Eime et al., 2013). The results highlighting higher levels of peer relationships and meaning and purpose also demonstrate benefits of sport

**Figure 23: Meaning and Purpose T-Scores by Years Involved in Sport and Non-Sport Activities**



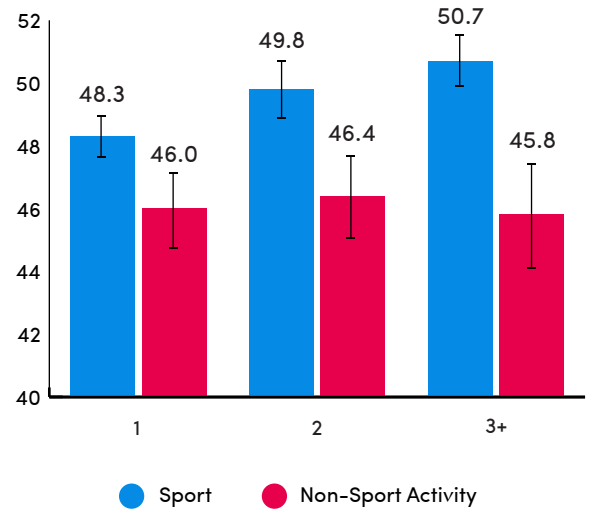
*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at 5-8 years and 9+ years of involvement; as well as between sport participants at 4 or fewer years and those at 5-8 and 9+ years of involvement.*

**Figure 24: Meaning and Purpose T-Scores by Total Number of Hours per Week Involved in Sport and Non-Sport Activities**



*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at 11+ hours per week; as well as between sport participants at 11+ hours per week and those at 1-6 and 7-10 hours per week.*

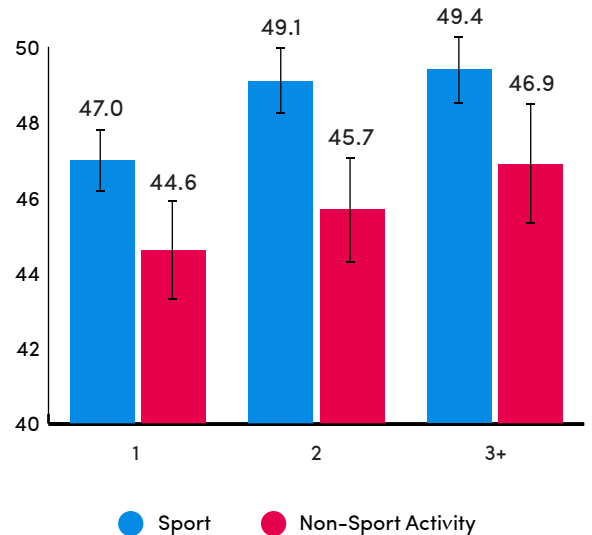
**Figure 25: Peer Relationships T-Scores by Current Number of Sport and Non-Sport Activities**



*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at all levels of involvement; as well as between sport participants who participate in 3+ sport and those who participate in 1 sport.*



**Figure 26: Meaning and Purpose T-Scores by Current Number of Sport and Non-Sport Activities**



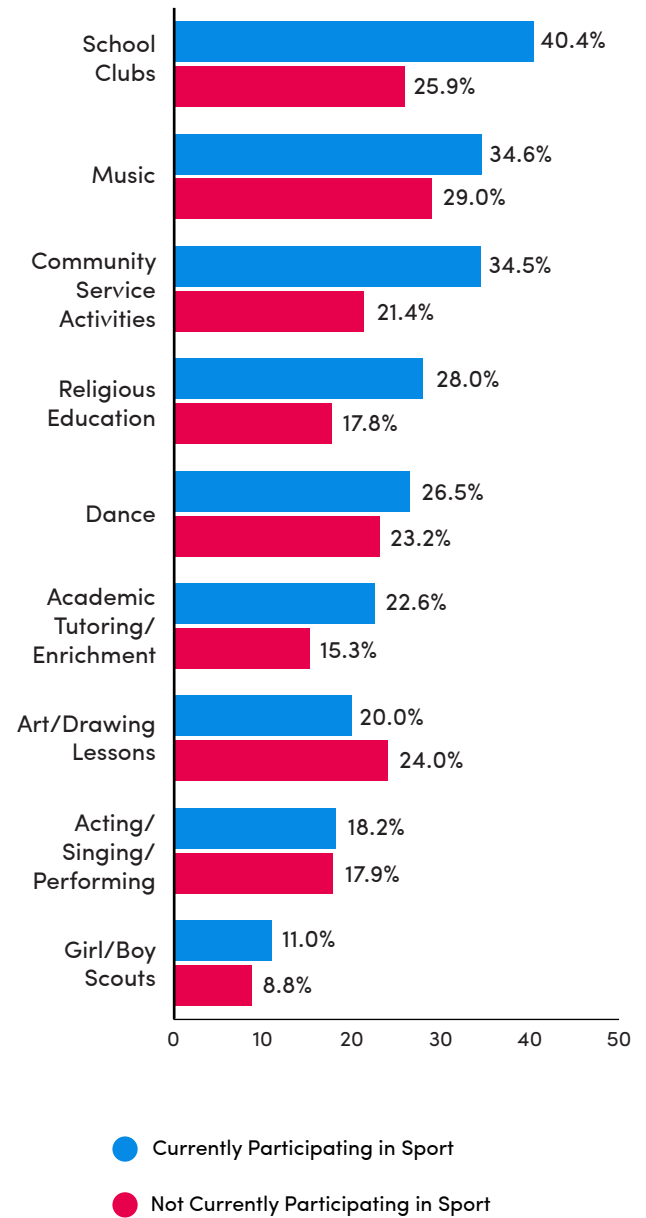
*Note: Statistical significance of 95% confidence exists between sport participants and non-sport activity participants at all levels of involvement; as well as between sport participants who participate in 2 or 3+ sports and those who participate in 1 sport.*

beyond mere physical activity (Murray et al., 2021), and align with previous research that shows sport is significantly and positively associated with multiple areas of social well-being (Easterlin et al., 2019; Holt, 2011). Thus, it is likely the combination of an environment to develop meaningful relationships concurrent with the benefits of physical activity that contributes to sport serving as a protective and promotive factor for mental health.

An additional, yet important finding, is that girls who participate in sport are also more engaged in other areas of life. Figure 27 shows the current sport participants are also significantly more likely than those who do not currently participate in sport to participate in school clubs (40.4% vs. 25.9%), music (34.6% vs. 29.0%), community service (34.5% vs. 21.4%), religious activities (28.0% vs. 17.8%), and academic enrichment activities (22.6% vs. 15.3%). Thus, sport may provide a positive reinforcement loop, which motivates young people to be involved in other positive developmental activities, thereby amplifying the overall benefit from sport (Whitley et al., 2018).



**Figure 27: Percentage of Girls who Participate in Non-Sport Activities, by Sport Participation**



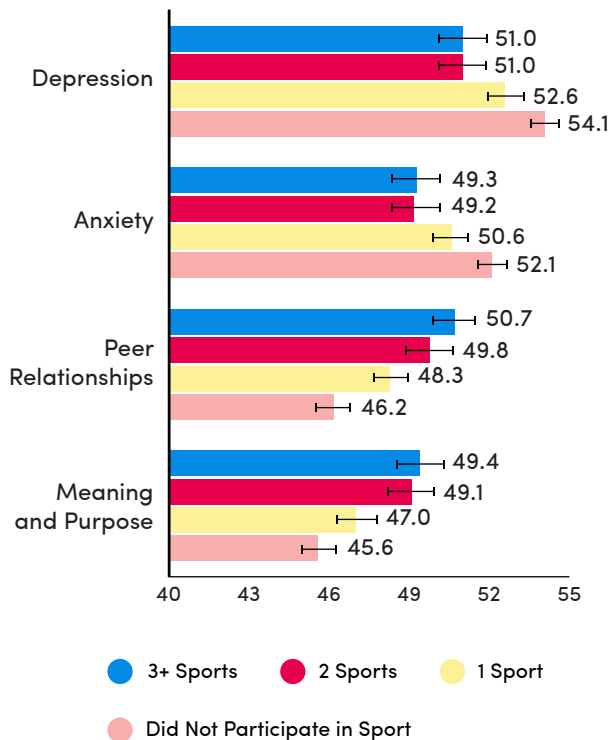
## Type of Sport and Mental Health Outcomes

### Section Summary

- Participating in two or more sports yields the most benefit for all mental health outcomes.
- Neither the type of sport nor the competition levels of the sport had a major impact on mental health outcomes.

The most consistent and meaningful finding as it relates to the type of sport is that girls who participated in multiple sports reported significantly better outcomes for depression, anxiety, peer relationships, and meaning and purpose (Figure 28). This finding adds to previous literature that highlights the importance of sport sampling over sport specialization. Youth who have deeper involvement in sport, participate on multiple teams, and participate in both team and individual sports have a greater benefit to their mental health and well-being (Evans et al., 2017).

**Figure 28: Mental Health T-Scores of Girls, by Number of Sports Played**



*Note: Statistical significance of 95% confidence exists between sport participants who play 2 or 3+ sports and non-sport activity participants for all categories.*

Specific to girls, diversified sport experiences are related to higher levels of sport participation and enjoyment as they transition to adulthood (Ryder et al., 2021).

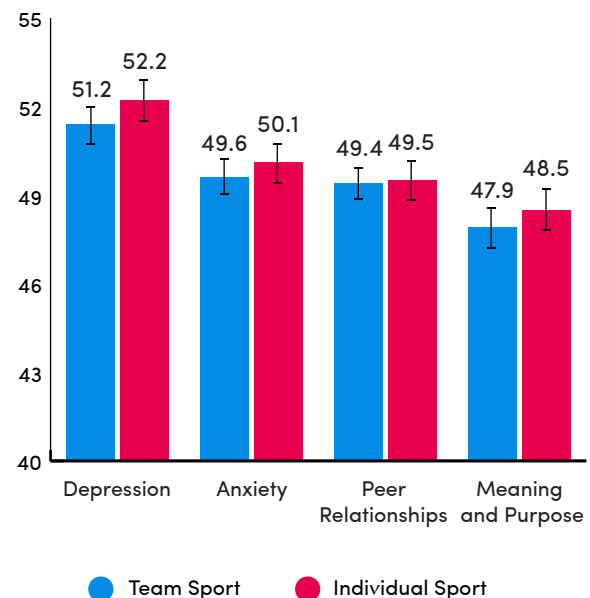
In terms of sport type, previous research has shown that team sport (e.g., volleyball, soccer) athletes are less likely to be depressed or anxious than individual sport (e.g., track and field, swimming) athletes (Pluhar et al., 2019). However, data in the current study did not find significant differences based on team sport status for anxiety, depression, peer relationships, or a sense of meaning and purpose (Figure 29).

There were no significant differences in depression (Figure 30, on following page), anxiety (Figure 31, on following page), peer relationships (Figure 32, on following page), or meaning and purpose (Figure 33, on following page) for girls who participate at the recreational level (i.e., community/recreation leagues), competitive level (i.e., middle school and junior varsity sports), and high competition level (i.e., elite youth clubs and high school varsity sports).

In terms of contact level, no differences in depression scores were noted between non-contact sport (e.g., track and field) participants, limited contact sport (e.g., softball) participants, or contact/high contact sport (e.g., basketball, rugby) athletes (Figure 34, on page 34).

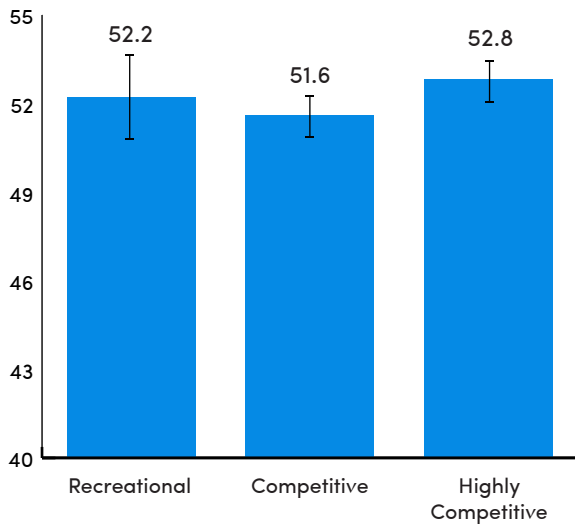
No differences were found across level of contact for anxiety (Figure 35, on page 34), peer relationships (Figure 36, on page 34) or meaning and purpose scores (Figure 37, on page 34).

**Figure 29: Mental Health T-Scores of Girls, by Type of Sport Played**

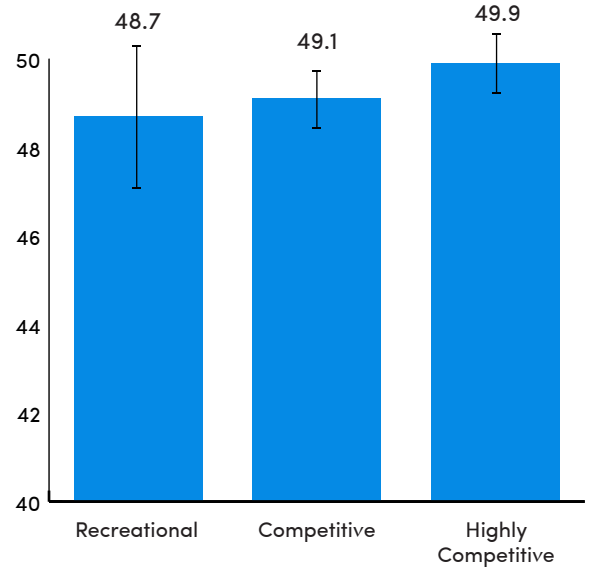




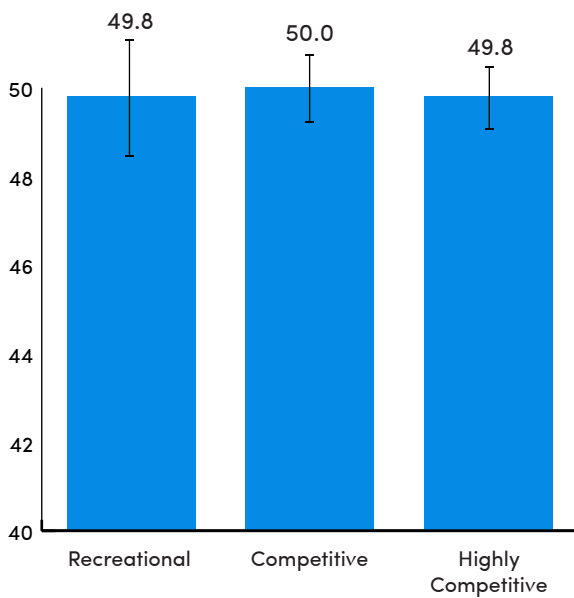
**Figure 30: Depression T-Scores by Sport Level**



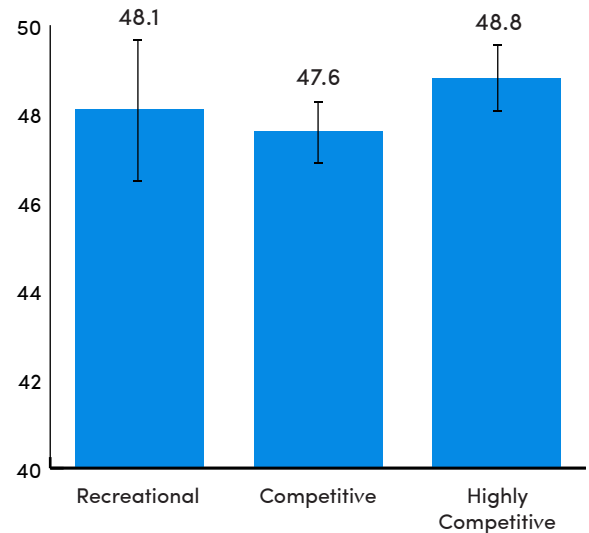
**Figure 32: Peer Relationships T-Scores by Sport Level**



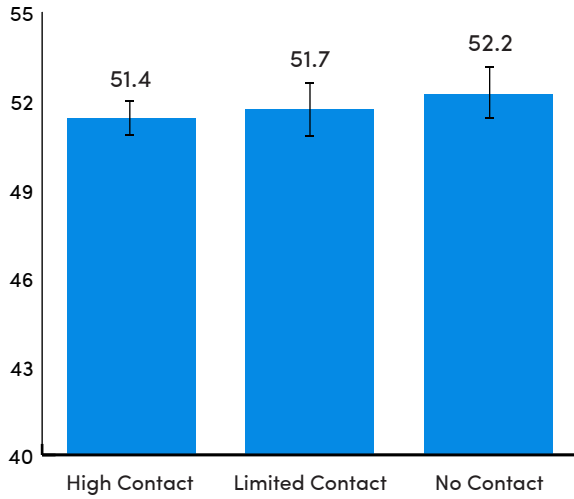
**Figure 31: Anxiety T-Scores by Sport Level**



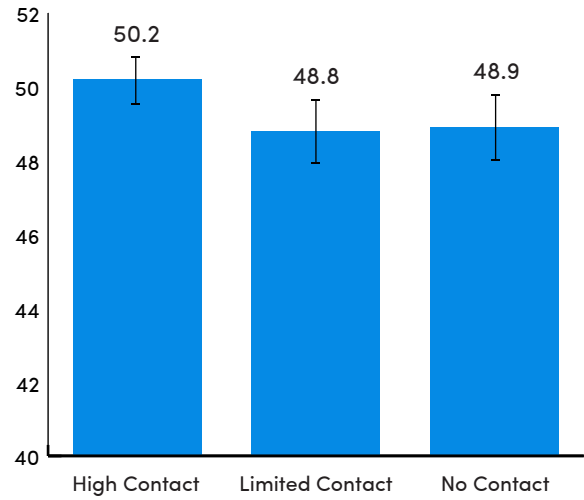
**Figure 33: Meaning and Purpose T-Scores by Sport Level**



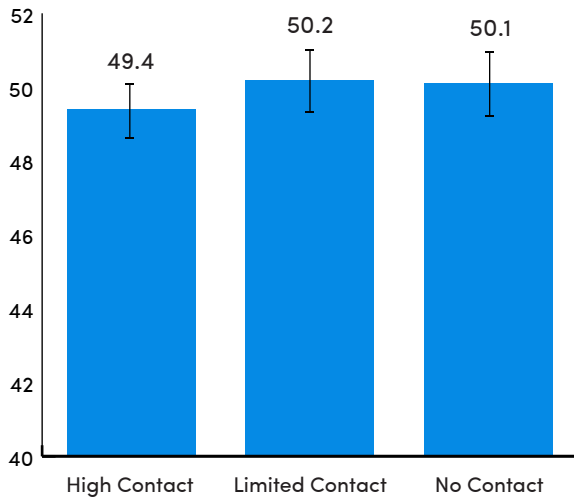
**Figure 34: Depression T-Scores by Sport Contact Level**



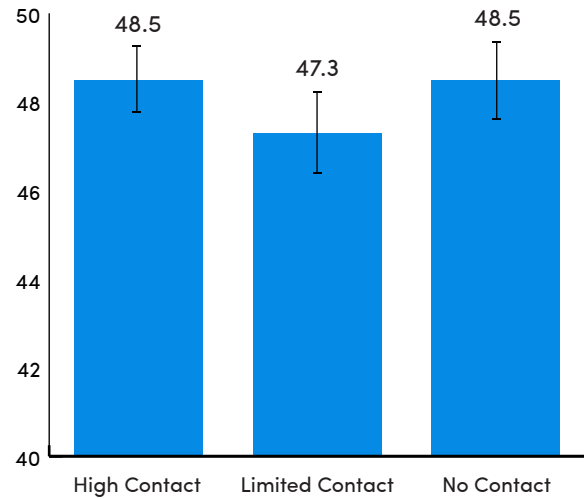
**Figure 36: Peer Relationships T-Scores by Sport Contact Level**



**Figure 35: Anxiety T-Scores by Sport Contact Level**



**Figure 37: Meaning and Purpose T-Scores by Sport Contact Level**



Overall, data in the current report did not present a clear pattern of how sport type affects the relationship between sport participation and mental health. While previous research has reported differences based on type of sport (Graupensperger et al., 2021; Guddal et al., 2019; Pluhar et al., 2019), data in the

current report point to an even greater need to understand how the sport environment affects the relationship between sport participation and mental health outcomes, particularly in adolescent girls.

## Role of the Sport Environment on Mental Health Outcomes

### Performance Climate

#### Section Summary

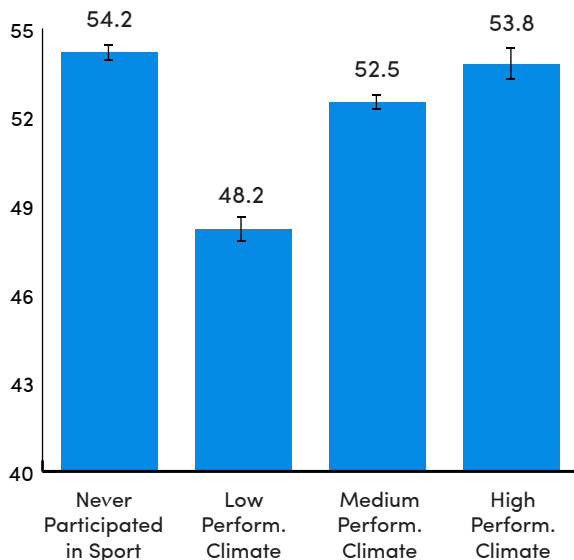
- Those scoring low in performance climate in sport were approximately 2 to 3 times less likely to have high anxiety and depression levels, respectively, than those scoring high in performance climate.

The first environmental construct we examined was the motivational climate that sport participants reported in their primary sport. A *performance climate*, which is defined by a main goal of winning, where success is defined as having higher ability than others, and where social comparisons are frequently made, has frequently been shown to produce less than optimal outcomes for athletes (see Appendix on page 68 for specific items in the current study). For example, previous intervention studies have shown that athletes who had coaches trained to de-emphasize a performance climate and instead focus on mastery, competence, and teamwork had lower levels of anxiety (Smith et al., 2007) and higher levels of

self-esteem (Smoll et al., 1993). In the current study, all mental health outcomes were affected by the motivational climate of girls' primary sport. As seen in Figure 38, girls who scored low in performance climate had significantly lower levels of depression than those who reported moderate or high scores in performance climate. Importantly, there were no differences in depression levels between non-sport participants and sport participants who reported high scores in performance climate.

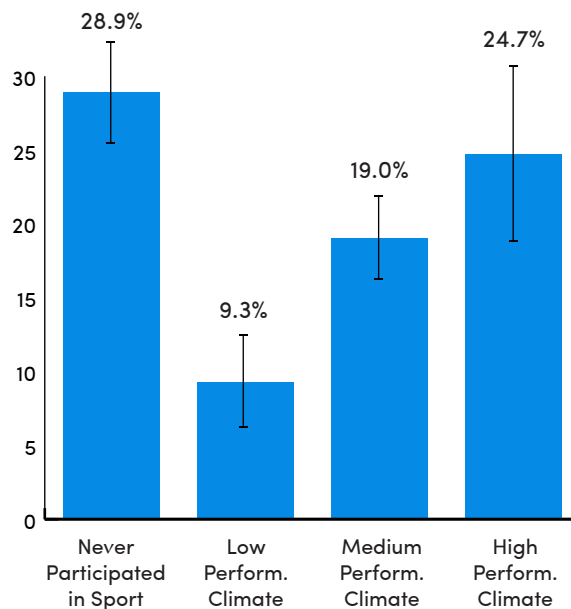
Further, Figure 39 shows that only 9.3% of girls scoring low in performance climate met the threshold for moderate-to-high levels of depression, which is significantly lower than the 18.9% and 24.7% of girls with moderate-to-high depression levels among those who had medium or high scores for performance climate.

**Figure 38: Depression T-Scores by Performance Climate**



Note: Statistical significance of 95% confidence exists between all categories with the exception of between those scoring high in performance climate and those who have never participated in sport.

**Figure 39: Percentage of Girls with Moderate-to-High Depression T-Scores by Performance Climate**



Note: Statistical significance of 95% confidence exists between those scoring low in performance climate and those scoring medium or high in performance climate, as well as between those scoring low or medium in performance climate and those who have participated in sport.

Data for anxiety follows a similar trend. Figure 40 shows that there are significant differences, with increasing levels of anxiety across low, medium, and high scores in performance climate. Similarly, no differences were observed between those not participating in sport and sport participants who reported high scores in performance climate. Figure 41 also shows that only 11.2% of girls scoring low in performance climate were classified as having moderate-to-high levels of anxiety, which is significantly lower than the 20.7% for girls scoring high in performance climate.

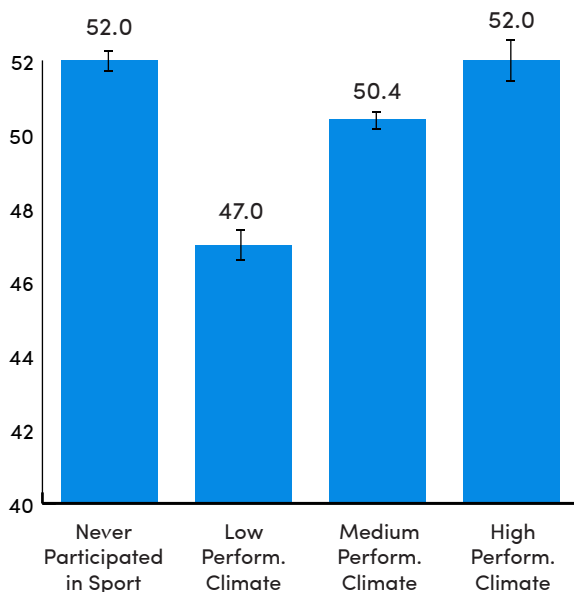
Examination of data on thriving for peer relationships and meaning and purpose also show the importance of the motivational climate. Notably, for both constructs, girls scoring low in performance climate reported significantly higher levels of peer relationships (Figure 42, on following page) and significantly higher levels meaning and purpose (Figure 43, on following page) than girls in the medium- or high-scoring performance climate groups.

Similarly, a significantly higher proportion of girls were classified in the moderate-to-high category of meaning and purpose among those scoring low in performance climate (41.5%) than those scoring medium (28.1%) or high (31.1%) in performance climate (Figure 44, on following page).

Interestingly, there was a significantly higher number of girls classified in the moderate-to-high category in peer relationships among those with low performance climate scores (31.2%) than among those with medium scores (19.7%), but the difference was not significant between the low-scoring performance climate and the high-scoring performance climate groups (24.5%) (Figure 45, on following page). It is possible that those highly competitive and goal-oriented athletes bonded over their shared focus on competition in the high-scoring performance climate group.

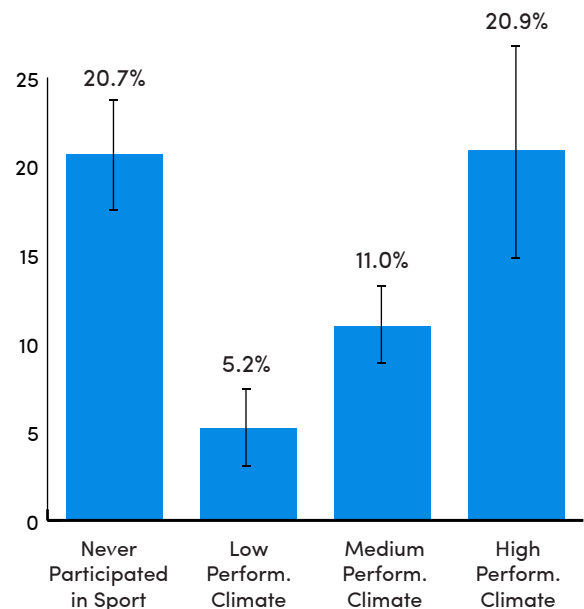
Taken together, these findings highlight the importance of the type of sport environment girls are exposed to. When winning and social comparisons are the focus, mental health outcomes are no better, and sometimes worse, than not participating in sport at all. However, when winning and social comparisons are de-emphasized in favor of other goals (e.g., mastery, collaboration, personal development) the benefits to mental health can be substantial (Eccles & Gootman, 2002; Granger et al., 2007; Yohalem & Wilson-Ahlstrom, 2010).

**Figure 40: Anxiety T-Scores by Performance Climate**



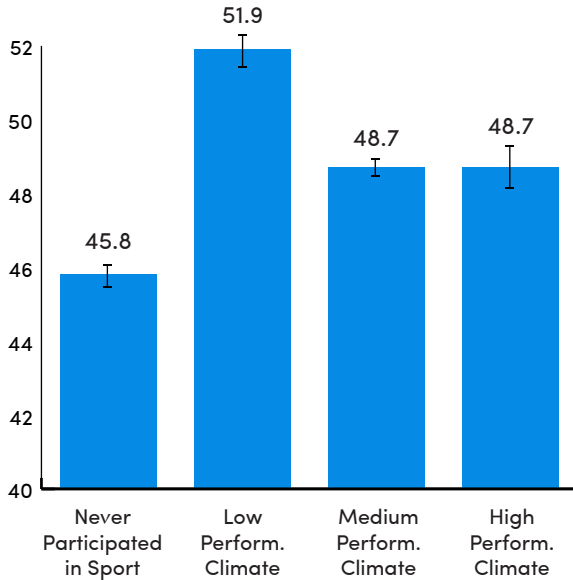
*Note: Statistical significance of 95% confidence exists between all categories with the exception of between those scoring high in performance climate and those who have never participated in sport.*

**Figure 41: Percentage of Girls with Moderate-to-High Anxiety T-Scores by Performance Climate**



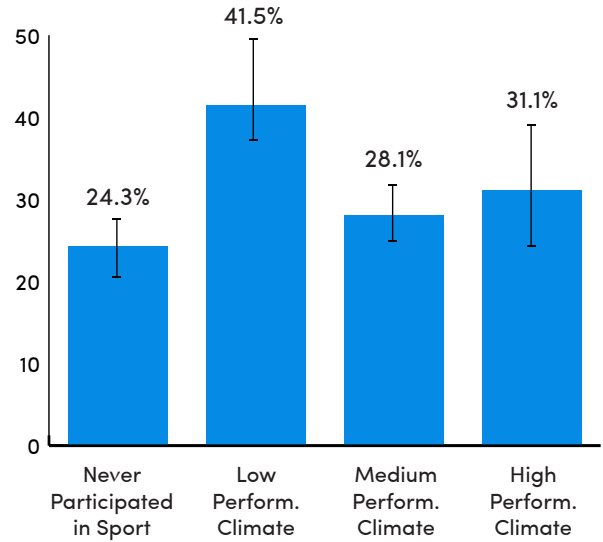
*Note: Statistical significance of 95% confidence exists between all categories with the exception of between those scoring high in performance climate and those who have never participated in sport.*

**Figure 42: Peer Relationships T-Scores by Performance Climate**



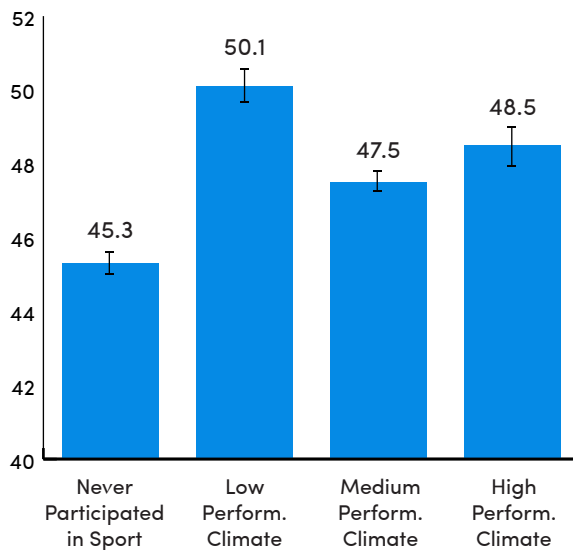
*Note: Statistical significance of 95% confidence exists between all categories with the exception of between those scoring medium in performance climate and those scoring high in performance climate.*

**Figure 44: Percentage of Girls with Moderate-to-High Meaning and Purpose T-Scores by Performance Climate**



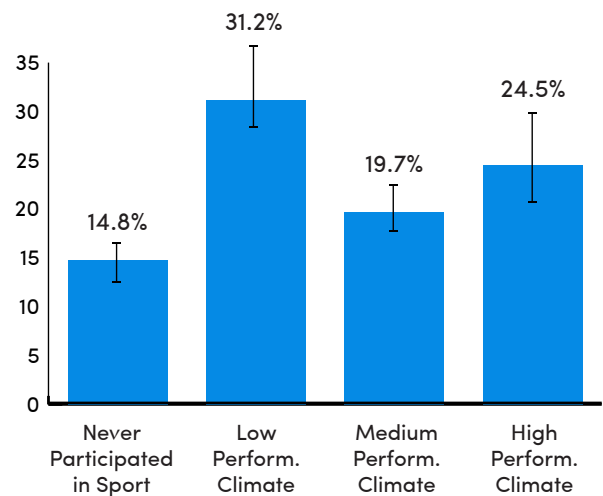
*Note: Statistical significance of 95% confidence exists between those scoring low in performance climate and those who never participated in sport, as well as between those scoring low in performance climate and those scoring medium in performance climate.*

**Figure 43: Meaning and Purpose T-Scores by Performance Climate**



*Note: Statistical significance of 95% confidence exists between all categories.*

**Figure 45: Percentage of Girls with Moderate-to-High Peer Relationships T-Scores by Performance Climate**



*Note: Statistical significance of 95% confidence exists between those who never participated in sport and all categories of those who have participated in sport, as well as between those scoring low in performance climate and those scoring medium in performance climate.*

## Perceptions of Autonomy

### Section Summary

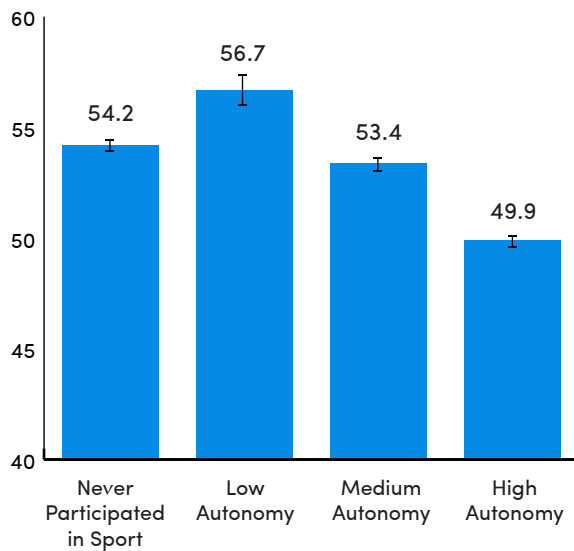
- For those reporting high autonomy in sport, their odds of a lower anxiety or depression score were approximately 2.5 and 4.5 times higher, respectively, than those reporting low autonomy.
- For those reporting high autonomy in sport, their odds of a better peer relationship or meaning and purpose score were approximately 8.5 and 10.5 times higher, respectively, than those reporting low autonomy.

Autonomy is defined by having choices and control over your training and performance (see Appendix on page 68 for specific items in the current study). Previous research has supported autonomy as a core motivational need, as well as having implications for a host of psychosocial outcomes in the sport context (Amorose & Anderson-Butcher, 2015; Bean & Forneris, 2019; Gill et al., 2017; Gillet et al., 2010). In the current study, all mental health outcomes were affected by perceptions of autonomy in girls' primary sport. As seen in Figure 46, with increasing levels of autonomy reported, there were significantly lower depression scores. Also, it was notable that those who reported the lowest levels of autonomy had significantly worse depression scores than non-sport participants. The same



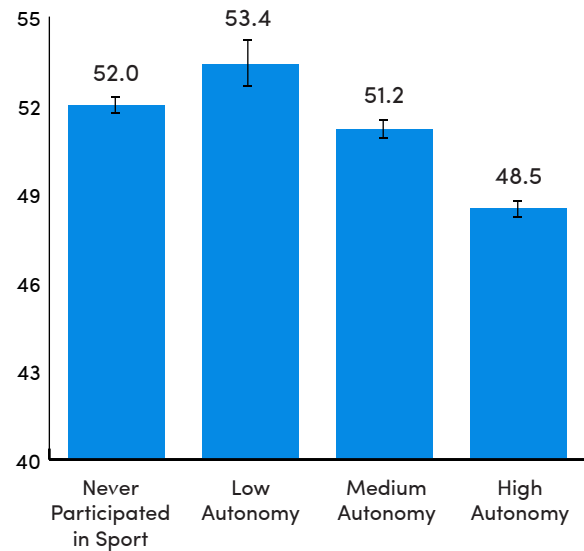
trend was observed for anxiety (Figure 47), peer relationships (Figure 48, on following page), and meaning and purpose (Figure 49, on following page). Specifically, with higher levels of autonomy reported, there were significant differences in mental health scores. Girls who reported low autonomy also reported significantly worse anxiety and meaning and purpose scores than non-sport participants.

**Figure 46: Depression T-Scores by Autonomy in Sport**



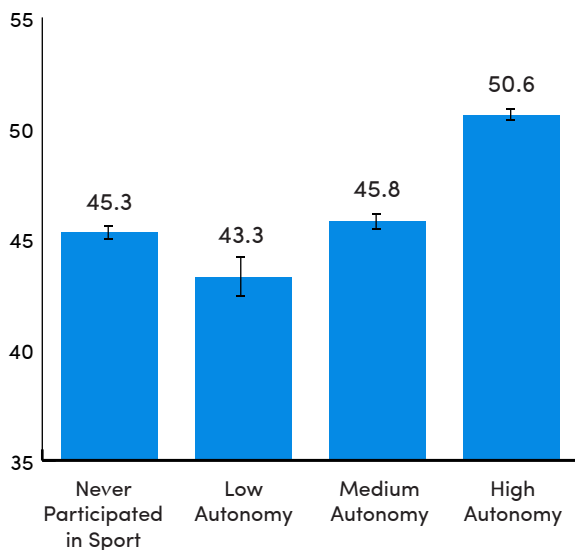
*Note: Statistical significance of 95% confidence exists between all categories.*

**Figure 47: Anxiety T-Scores by Autonomy in Sport**



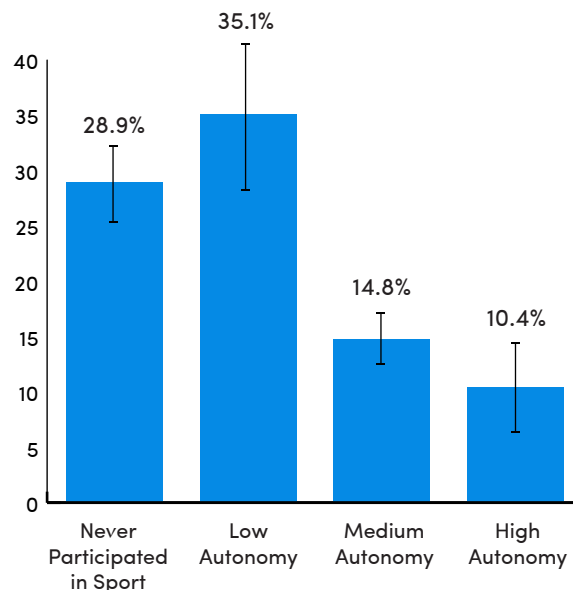
*Note: Statistical significance of 95% confidence exists between all categories.*

**Figure 48: Meaning and Purpose T-Scores by Autonomy in Sport**



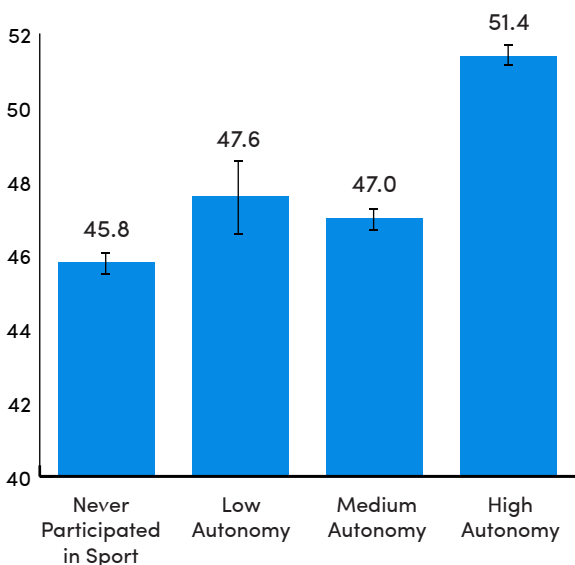
*Note: Statistical significance of 95% confidence exists between all categories with the exception of between those scoring medium in autonomy in sport and those who have never participated in sport.*

**Figure 50: Percentage of Girls with Moderate-to-High Depression T-Scores by Autonomy in Sport**



*Note: Statistical significance of 95% confidence exists between those scoring low in autonomy in sport and those scoring medium and high in autonomy in sport, as well as between those who never participated in sport and those scoring medium and high in autonomy in sport.*

**Figure 49: Peer Relationships T-Scores by Autonomy in Sport**



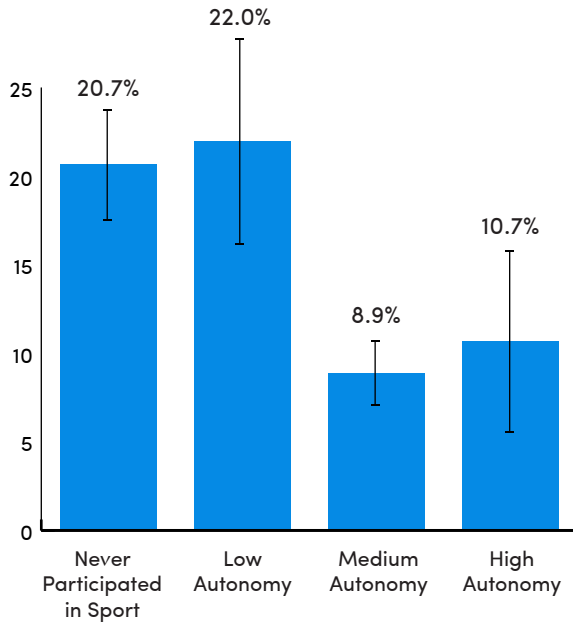
*Note: Statistical significance of 95% confidence exists between all categories with the exception of between those scoring low in autonomy in sport and those scoring medium in autonomy in sport.*

In terms of mental health risk, Figure 50 shows that 35.1% of girls in the low-autonomy group were in the moderate-to-high category for depression, which is significantly higher than the 14.8% of girls with moderate-to-high depression scores in the medium-autonomy group and the 10.4% of girls in the high-autonomy group.

Similarly, Figure 51 (on following page) shows that 22.0% of girls in the low-autonomy group were in the category of moderate-to-high levels of anxiety, which is significantly higher than the 8.9% of girls with moderate-to-high anxiety scores in the medium-autonomy group and the 10.7% of girls in the high-autonomy group.

Indicators of thriving also highlight the importance of autonomy. Figure 52 (on following page) shows that the largest percentage of girls in the moderate-to-high group for meaning and purpose (68.6%) reported high levels of autonomy as compared to 28.9% and 17.0% of girls in the medium- and low-autonomy groups, respectively. Similarly, 54.5% of girls in the high-autonomy group were categorized as moderate-to-high for peer relationships compared to only 20.4% and 12.2% of girls in the medium- and low-autonomy groups, respectively (Figure 53, on following page).

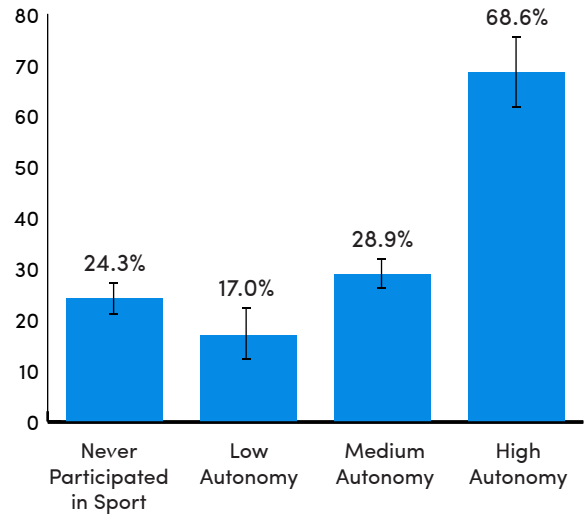
**Figure 51: Percentage of Girls with Moderate-to-High Anxiety T-Scores by Autonomy in Sport**



*Note: Statistical significance of 95% confidence exists between those scoring low in autonomy in sport and those scoring medium and high in autonomy in sport, as well as between those who never participated in sport and those scoring medium and high in autonomy in sport.*

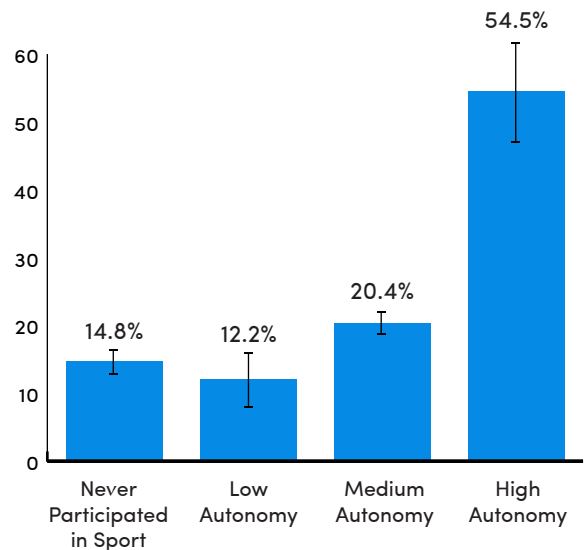
Similar to the above, these findings point to the importance of the environment created within sport. Coaches are tasked with being key actors in delivering a quality program to promote engagement and positive health outcomes. To support youth's needs for autonomy (defined as an individual's sense of having choice, an internal perceived locus of causality, and volition), autonomy-supportive coaching (Mageau & Vallerand, 2003; Ryan & Deci, 2017) involves engaging youth in dialogue (two-way communication), providing youth meaningful choices, acknowledging athletes' feelings and seeking to understand youth's perspectives, and providing opportunities and demonstrating shared values for youth input and voice. These components are critical in ensuring sport is structured to optimize the mental health of participants.

**Figure 52: Percentage of Girls with Moderate-to-High Meaning and Purpose T-Scores by Autonomy in Sport**



*Note: Statistical significance of 95% confidence exists between those scoring high in autonomy in sport and all other categories, as well as between those scoring low in autonomy in sport and those scoring medium in autonomy in sport.*

**Figure 53: Percentage of Girls with Moderate-to-High Peer Relationships T-Scores by Autonomy in Sport**



*Note: Statistical significance of 95% confidence exists between those scoring high in autonomy in sport and all other categories, as well as between those scoring medium in autonomy in sport and those scoring low and those who never participated in sport.*



## Social Cohesion

### Section Summary

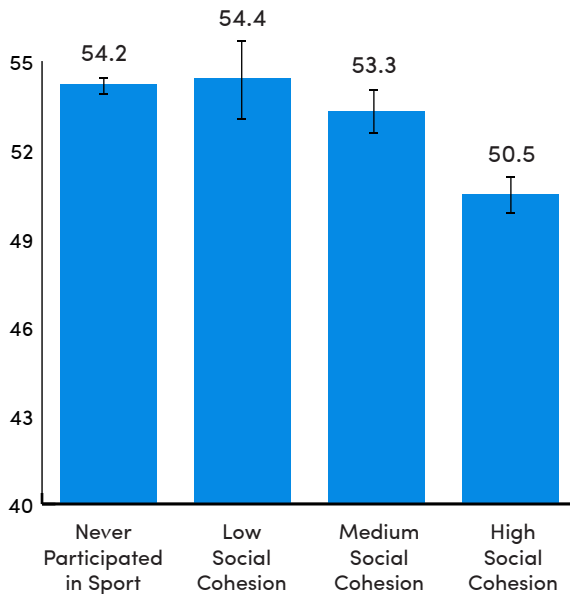
- For those reporting low social cohesion in sport, their odds of a worse depression or anxiety score were approximately 2 times higher than those reporting high social cohesion.
- For those reporting high social cohesion in sport, their odds of a better meaning and purpose or peer relationship score were approximately 2 and 5 times higher, respectively, than those reporting low social cohesion.

Social cohesion in sport refers to how much teammates like one another and the positive nature of their interactions. Previous research has shown that greater levels of social cohesion in sport are related to lower levels of negative experiences (Bruner et al., 2014). It is also well-documented that positive peer relationships in sport help meet core psychological needs (Eime et al., 2013; Strachan et al., 2009). In the current study, those reporting the highest levels of social cohesion had significantly lower depression scores than all other groups (Figure 54) and significantly lower anxiety scores than the



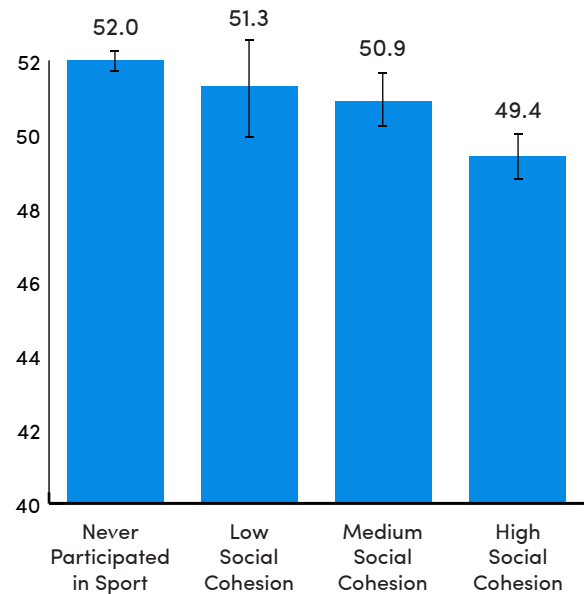
group reporting medium levels of social cohesion (Figure 55). It also was notable that those who reported the lowest levels of social cohesion had similar anxiety and depression scores as non-sport participants.

**Figure 54: Depression T-Scores by Social Cohesion**



*Note: Statistical significance of 95% confidence exists between those scoring high in social cohesion and all other categories.*

**Figure 55: Anxiety T-Scores by Social Cohesion**



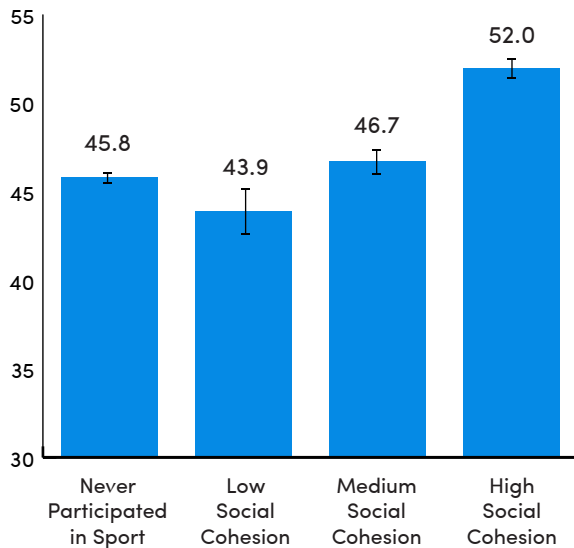
*Note: Statistical significance of 95% confidence exists between those scoring high in social cohesion and those scoring medium in social cohesion and those who never participated in sport.*

A similar, but more pronounced, trend was observed for peer relationships (Figure 56) and meaning and purpose (Figure 57). With increasing levels of social cohesion, data show significantly higher levels of thriving for girls in the current study. Similarly, those with low social cohesion reported similar meaning and purpose and peer relationship scores as non-sport participants.

Figure 58 shows that 27.2% of girls in the low social cohesion group and 21.8% of girls in the medium social cohesion group were categorized in the moderate-to-high depression group, which is significantly higher than the 12.9% of girls with moderately-to-high depression scores in the high social cohesion group. Figure 59 (on following page) shows that 16.9% of girls in the low social cohesion group were categorized in the moderate-to-high anxiety group, while 11.9% and 9.6% of girls with moderate-to-high anxiety scores were in the moderate and high social cohesion groups, respectively. These scores were not significantly different from one another.

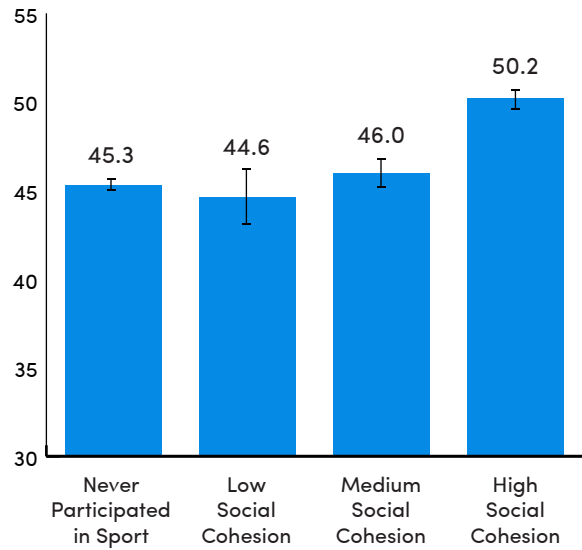
Indicators of thriving also highlight the importance of social cohesion. Figure 60 (on following page) shows that the largest percentage of girls categorized as moderate-to-high for peer relationships (31.7%) reported high levels of social cohesion, as compared to 15.2% and 8.6% of girls in the medium and low social cohesion groups, respectively. Similarly, as shown in Figure 61 (on following page), 38.5% of girls in the high social cohesion group were categorized as moderate-to-high for meaning and purpose, compared to only 23.7% and 23.9% of girls in the medium and low social cohesion groups, respectively.

**Figure 56: Peer Relationships T-Scores by Social Cohesion**



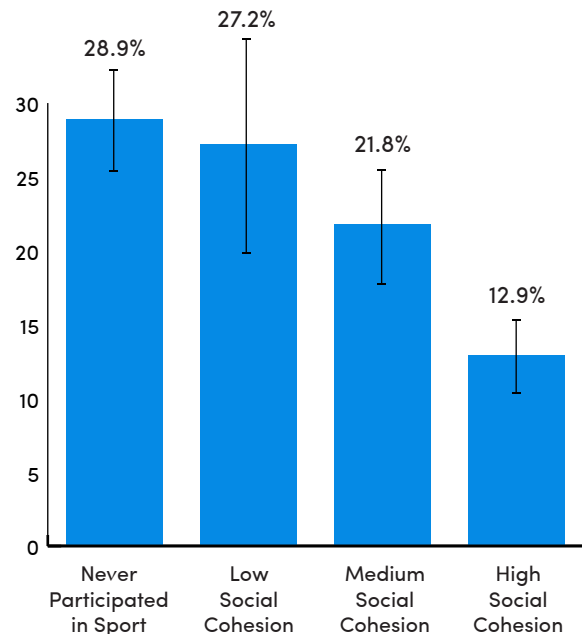
*Note: Statistical significance of 95% confidence exists between all categories, with the exception of between those scoring medium in social cohesion and those who never participated in sport.*

**Figure 57: Meaning and Purpose T-Scores by Social Cohesion**



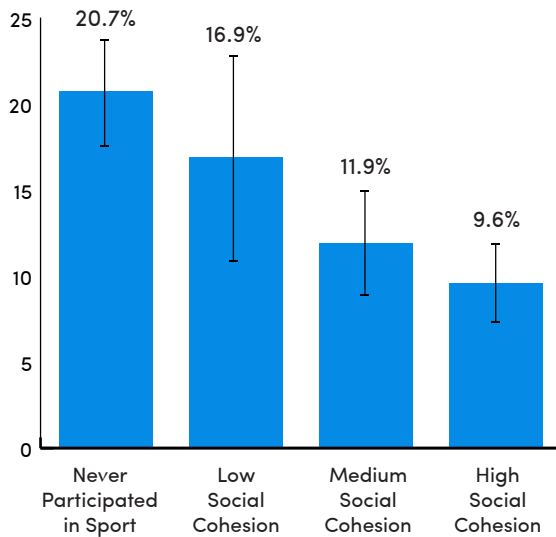
*Note: Statistical significance of 95% confidence exists between those scoring high in social cohesion and all other categories.*

**Figure 58: Percentage of Girls with Moderate-to-High Depression T-Scores by Social Cohesion**



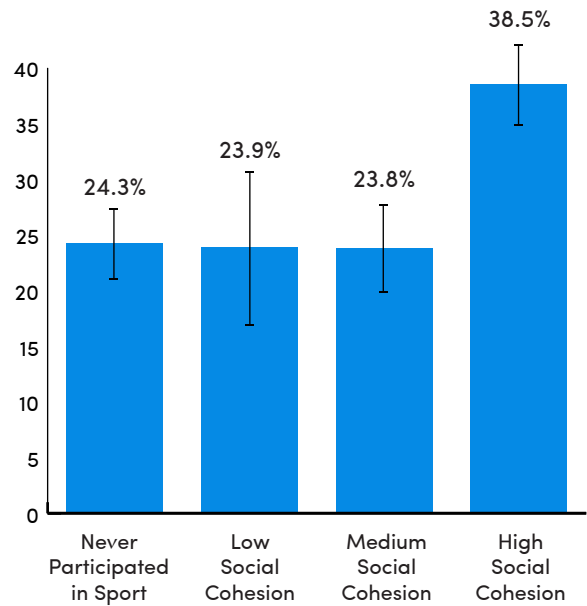
*Note: Statistical significance of 95% confidence exists between those scoring high in social cohesion and all other categories.*

**Figure 59: Percentage of Girls with Moderate-to-High Anxiety T-Scores by Social Cohesion**



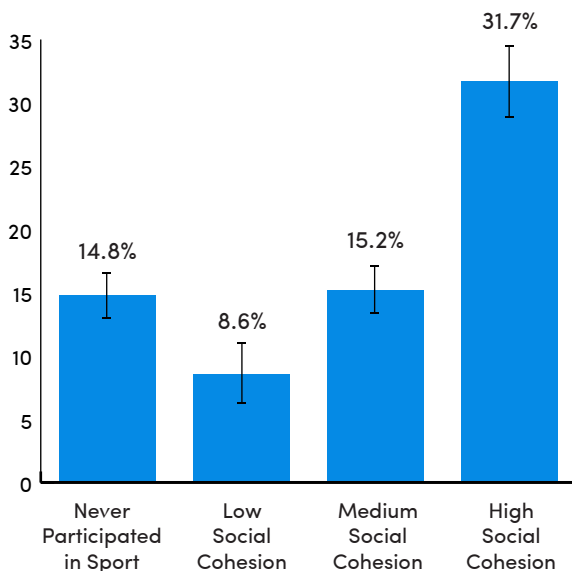
*Note: Statistical significance of 95% confidence exists between those scoring medium and high in social cohesion and those who never participated in sport.*

**Figure 61: Percentage of Girls with Moderate-to-High Meaning and Purpose T-Scores by Social Cohesion**



*Note: Statistical significance of 95% confidence exists between those scoring high in social cohesion and all other categories.*

**Figure 60: Percentage of Girls with Moderate-to-High Peer Relationships T-Scores by Social Cohesion**



*Note: Statistical significance of 95% confidence exists between those scoring high in social cohesion and all other categories, as well as between those scoring low in social cohesion and all other categories.*

Again, findings point to the importance and quality of the sport environment as it relates to the mental health benefit gained through sport. To satisfy youth needs for relatedness, coaches, as well as administrators, parents, and other key stakeholders, must establish a setting that fosters a sense of mutual belonging, social connection, and feeling cared for by those in the sport environment (Baumeister & Leary, 1995). There is likely an interaction between the motivational climate a coach creates and a sense of cohesion that can satisfy one's need for relatedness. Specifically, if coaches are fixated on winning at all costs, they likely will do so at the expense of relationships between players within the sport setting, which can be damaging for mental health. However, a focus on personal growth, collaboration, and team cohesion – all of which can also aide in team performance (Carron et al., 2002) – is a necessary condition of the sport environment.

## Coach Relationships

### Section Summary

- For those reporting high coach relationship in sport, their odds of a lower anxiety or depression score were approximately 3 and 3.5 times higher, respectively, than those reporting low or medium coach relationships.

Coach relationship was measured by examining the closeness and comfortability girls had with their primary sport coach. Previous research has shown the coach-athlete relationship to be a critical determinant of the sport experience because it is “the medium that motivates, assures, satisfies, comforts, and supports coaches and athletes to enhance their sport experience, performance, and well-being” (Jowett, 2017, p. 154). For example, stronger coach-athlete relationships have predicted engagement and burnout throughout the season (McGee & DeFreese, 2019), goal outcomes, and mental health (Bissett et al., 2020). In the current study, all mental health outcomes were affected by the coach-athlete relationship in girls’ primary sport. For girls reporting low or medium levels of

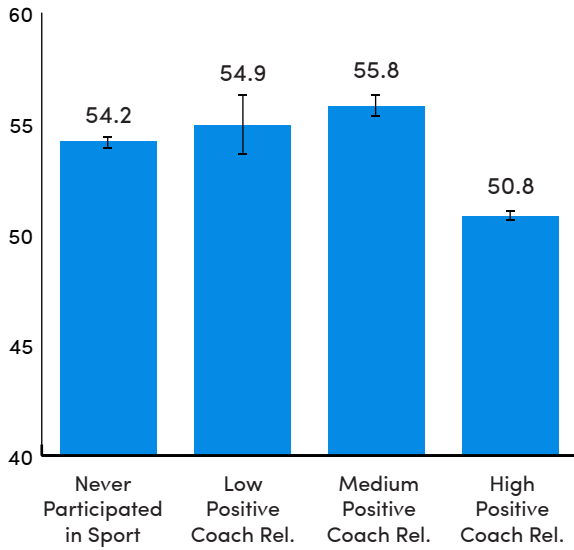
positive relationships with their coaches, depression and anxiety scores were similar or worse than for non-sport participants. However, those reporting high levels of coach relationships had significantly lower depression scores (Figure 62, on following page) and anxiety scores (Figure 63, on following page) than all other participants. This same trend held for meaning and purpose (Figure 64, on following page).

Interestingly, girls who reported either a high or a low relationship with their coach reported significantly higher scores on peer relationships than both those in the medium coach relationship and non-sport participants (Figure 65, on following page). It is possible that girls with a poor coach relationship take refuge in the relationships with other players on the team.

Figure 66 (on page 46) shows that only 13.4% of girls in the high coach relationship group were categorized in the moderate-to-high depression group, which is significantly lower than the 28.9% of girls with moderate-to-high depression scores in the medium coach relationship group. Similarly, Figure 67 (on page 46) shows that only 8.9% of girls in the high coach relationship group were categorized in the moderate-to-high anxiety group, compared with 21.9% and 20.8% of girls in the medium and low coach relationship groups, respectively.

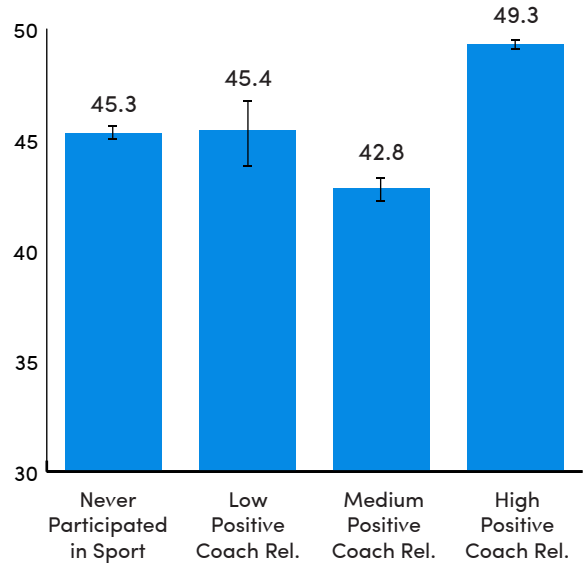


**Figure 62: Depression T-Scores by Positive Coach Relationship**



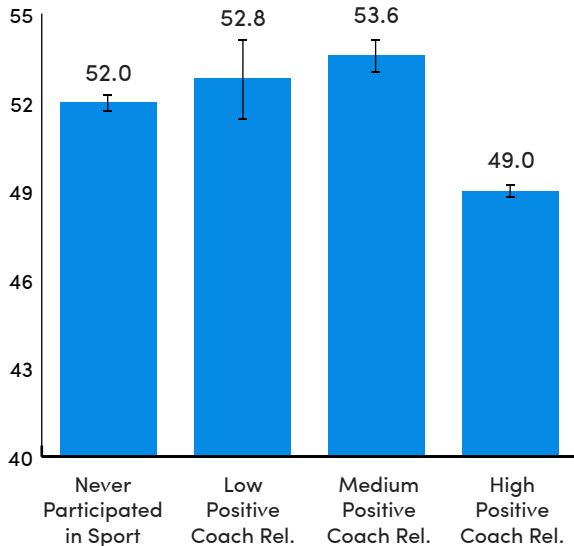
*Note: Statistical significance of 95% confidence exists between those scoring high in positive coach relationships and all other categories, as well as between those scoring medium in positive coach relationships and those who have never participated in sport.*

**Figure 64: Meaning and Purpose T-Scores by Positive Coach Relationship**



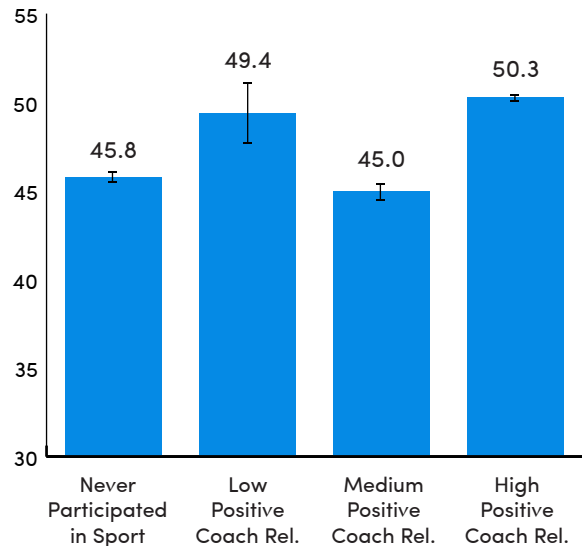
*Note: Statistical significance of 95% confidence exists between those scoring high in positive coach relationships and all other categories, as well as between those scoring medium in positive coach relationships and all other categories.*

**Figure 63: Anxiety T-Scores by Positive Coach Relationship**



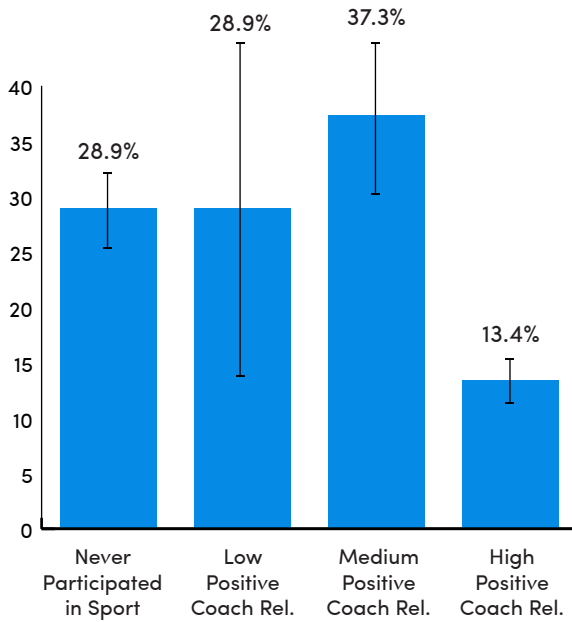
*Note: Statistical significance of 95% confidence exists between those scoring high in positive coach relationships and all other categories, as well as between those scoring medium in positive coach relationships and those who have never participated in sport.*

**Figure 65: Peer Relationships T-Scores by Positive Coach Relationship**



*Note: Statistical significance of 95% confidence exists between those who have never participated in sport and all other categories, as well as between those scoring medium in positive coach relationships and all other categories.*

**Figure 66: Percentage of Girls with Moderate-to-High Depression T-Scores by Positive Coach Relationship**

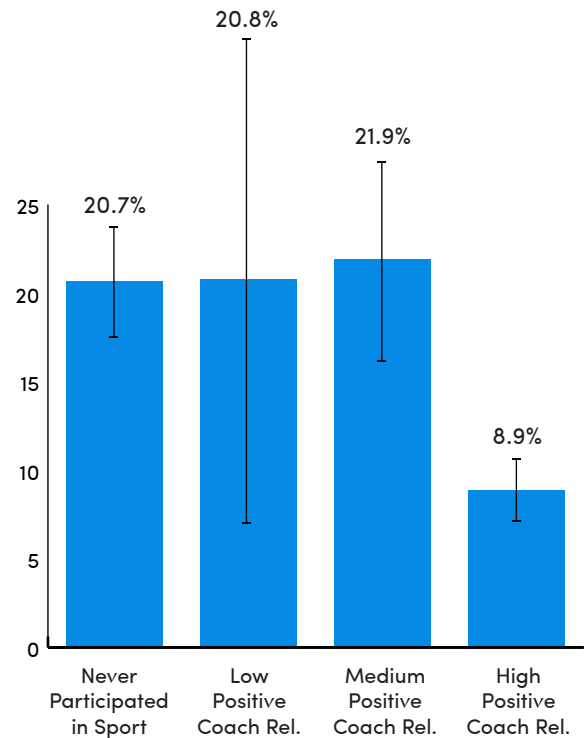


*Note: Statistical significance of 95% confidence exists between those scoring high in positive coach relationships and those scoring medium as well as those who have never participated in sport.*

Indicators of thriving indicated that those in the highest and lowest categories of coach relationship reported the highest scores on both meaning and purpose (Figure 68, on following page) and peer relationships (Figure 69 on following page).

Positive coach-athlete relationships are also known to influence adolescents' intentions to continue participating in sport (Wekesser et al., 2021). Similarly, athletes' positive perceptions of their relationships with their coaches predicted lower instances of depression and better psychological well-being (Powers et al., 2020). On the other hand, interpersonal conflicts between coaches and athletes were shown to predict athlete ill-being and negative affect (Davis & Jowett, 2014). The keys to a healthy and strong coach-athlete relationship lie, in part, on perceptions of closeness (Jowett, 2017). Coaches' efforts to work with athletes holistically, as well as athletes' efforts to find common ground with their coaches, can enhance well-being (Davis et al., 2023).

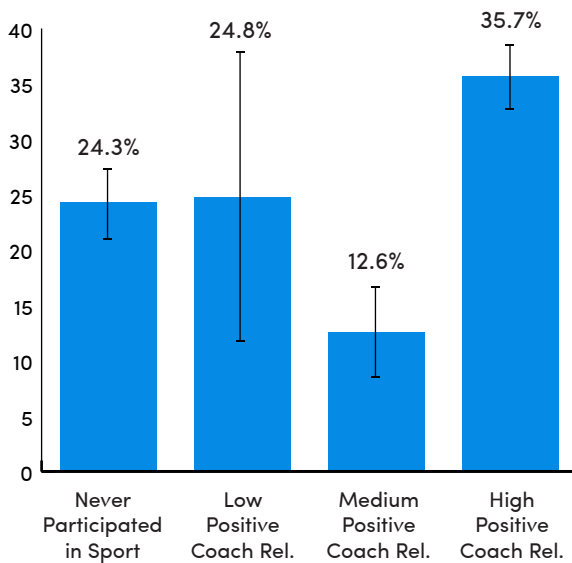
**Figure 67: Percentage of Girls with Moderate-to-High Anxiety T-Scores by Positive Coach Relationship**



*Note: Statistical significance of 95% confidence exists between those scoring high in positive coach relationships and those scoring medium as well as those who have never participated in sport.*

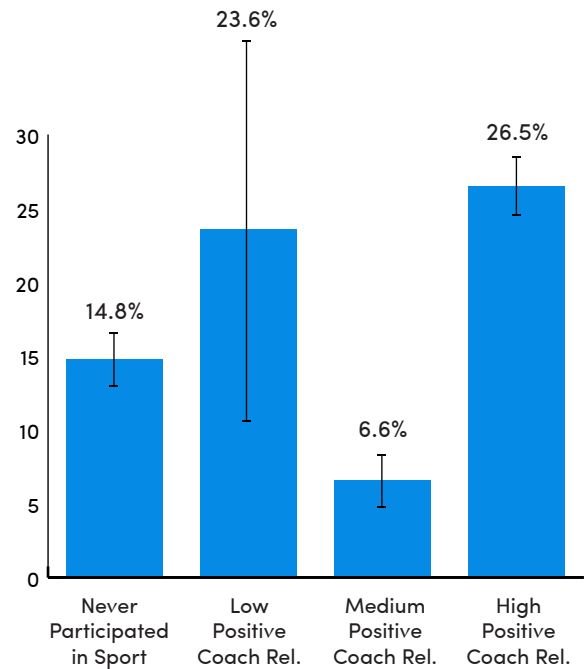


**Figure 68: Percentage of Girls with Moderate-to-High Meaning and Purpose T-Scores by Positive Coach Relationship**



*Note: Statistical significance of 95% confidence exists between those scoring high in positive coach relationships and those scoring medium as well as those who have never participated in sport.*

**Figure 69: Percentage of Girls with Moderate-to-High Peer Relationships T-Scores by Positive Coach Relationship**



*Note: Statistical significance of 95% confidence exists between those all categories with the exception of those scoring low in positive coach relationships, who were only statistically significant when compared to those with medium scores.*



## Demographic Differences in Sport Participation and Mental Health Outcomes

### Section Summary

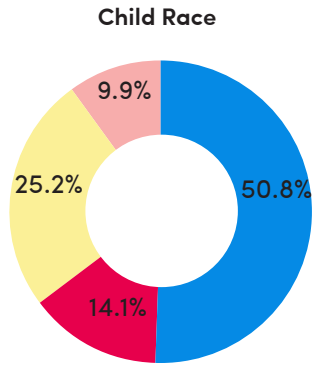
- One-third of girls in the study had never participated in sport; and marginalized girls, including girls of color, sexual minority groups, low-income girls, and girls with disabilities, have the lowest levels of access.
- The association between sport participation and positive mental health outcomes did not differ substantially across race, family income, parent education, sexual identity, and disability status.
- Girls with disabilities who participate in sport report better mental health. They also find a stronger sense of meaning and purpose in life than those who do not participate in sport.

A dearth of previous research exists on whether sport participation is more beneficial for some youth than others, or whether all youth across race, genders, socioeconomic conditions, sexual orientation, and disability benefit similarly. However, research has shown inequities exist in who has access to sport in the first place. Data in the current study report a similar trend. Figure 70 (on following page) shows the overall demographic data of study participants. In examining group differences, data in the current study show that equity, particularly for girls with intersectional identities of groups that have been historically marginalized in both sport and society, remains an issue. Notably, girls who identify as White were significantly more likely to be sport participants than not (57.0% vs. 44.2%), whereas girls who identify as Black (11.3% vs. 17.1%), Hispanic (23.3% vs. 27.2%), or other races (8.4% vs. 11.6%) were significantly less likely to be sport participants (Figure 71, on page 50). Girls also were significantly more likely to be sport participants if their reported household income was over \$100,000 annually and significantly less likely to be sport participants if their annual household income was less than \$50,000 (Figure 72, on page 50).

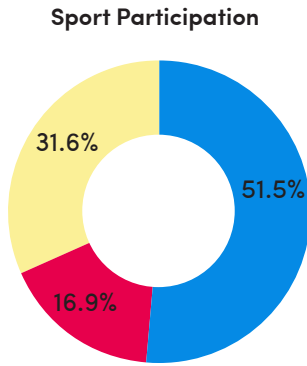




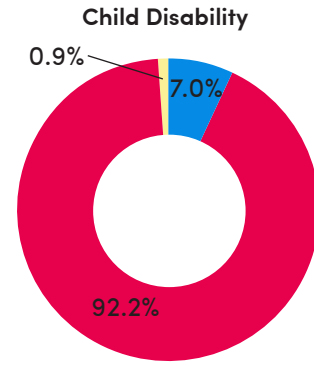
Figure 70: Demographics of Study Participants



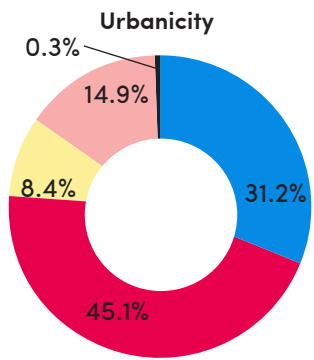
White Black  
Hispanic Other



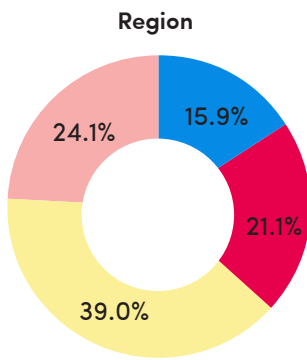
Current Participant  
Past Participant  
Never Participated



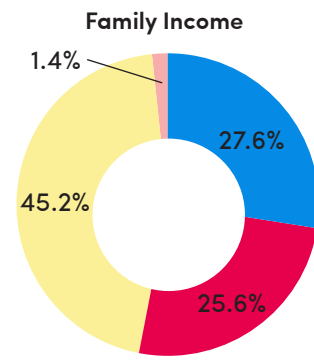
Indicated Having a Disability  
Did Not Indicate Having a Disability  
Preferred Not to Say



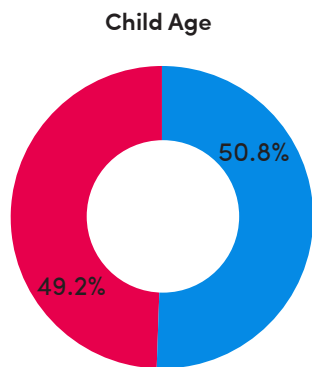
City Suburb Town  
Rural Other



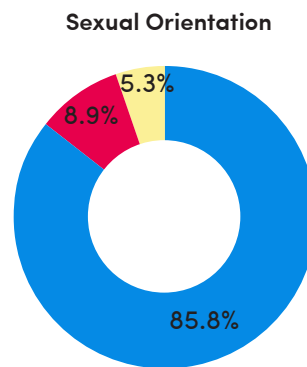
Northeast Midwest  
South West



<\$50,000 \$50,000-\$99,999  
<\$100,000 Preferred Not to Say

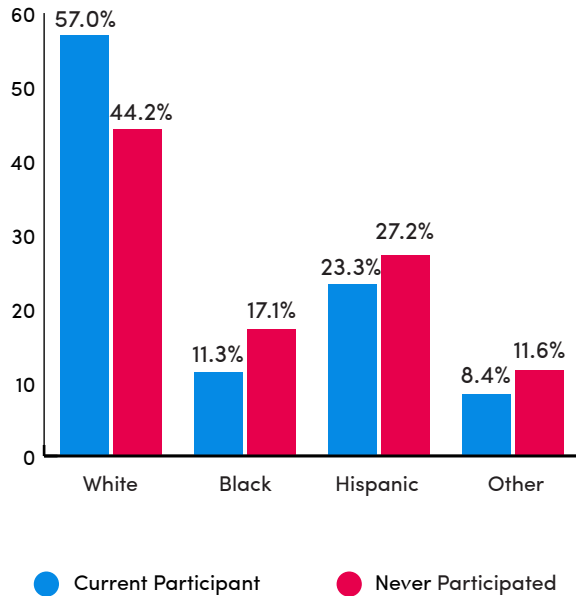


12-14 15-17



Heterosexual/Straight LGBTQ+  
Preferred Not to Say/Don't Know

**Figure 71: Study Participants' Sport Participation, by Race**

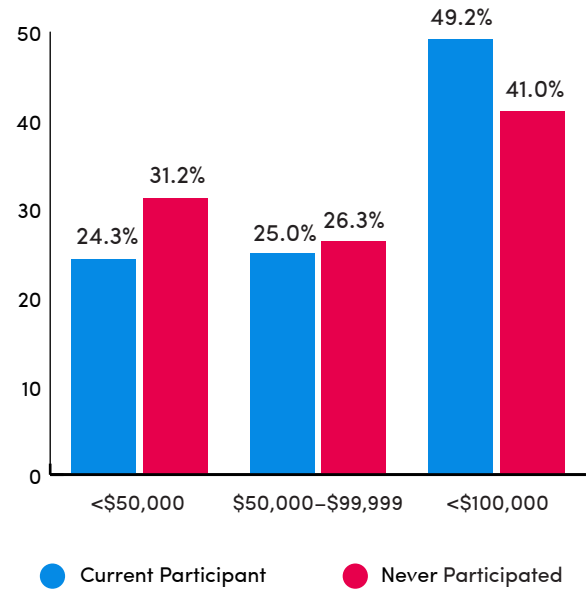


Similar trends can be seen for girls with disabilities. Girls with disabilities were significantly less likely to be sport participants (4.4% of sport participants reported a disability vs. 10.4% of non-sport participants reported a disability) (Figure 73).

Data on sexual orientation also showed a similar trend (Figure 74, on following page). Of sport participants, 89.8% identified as heterosexual, whereas 6.4% identified as LGBTQ+ and 3.8% responded they did not know or preferred not to say.

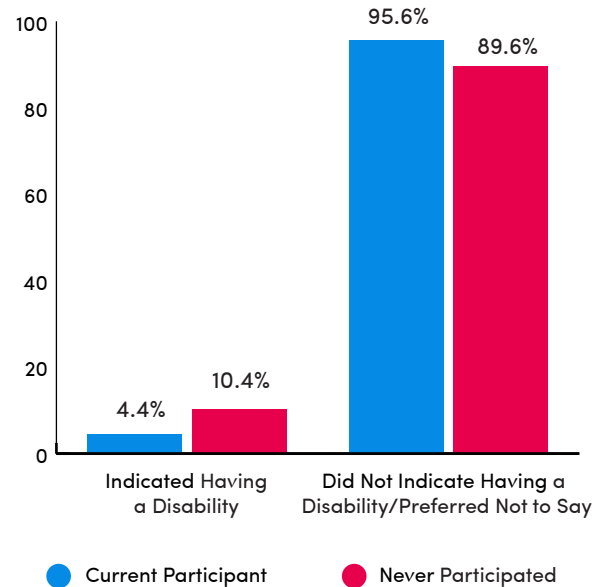


**Figure 72: Study Participants' Sport Participation, by Family Income**

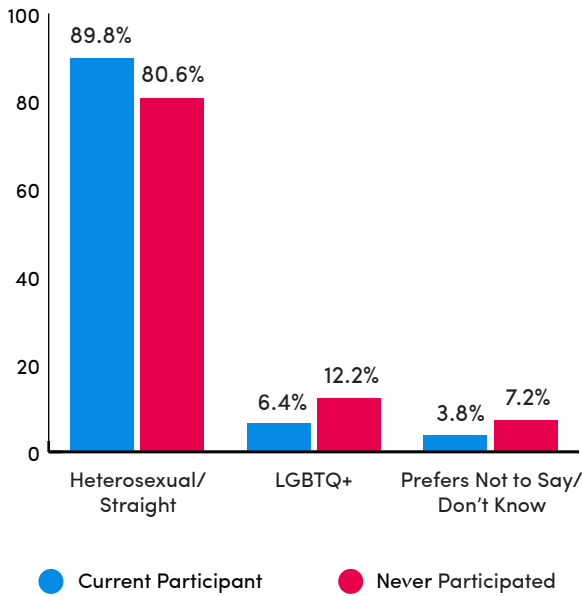


*Note: The parent/guardian of 1.3% of current sport participants and 1.5% of those who never participated in sport preferred not to disclose income.*

**Figure 73: Study Participants' Sport Participation, by Disability Status**



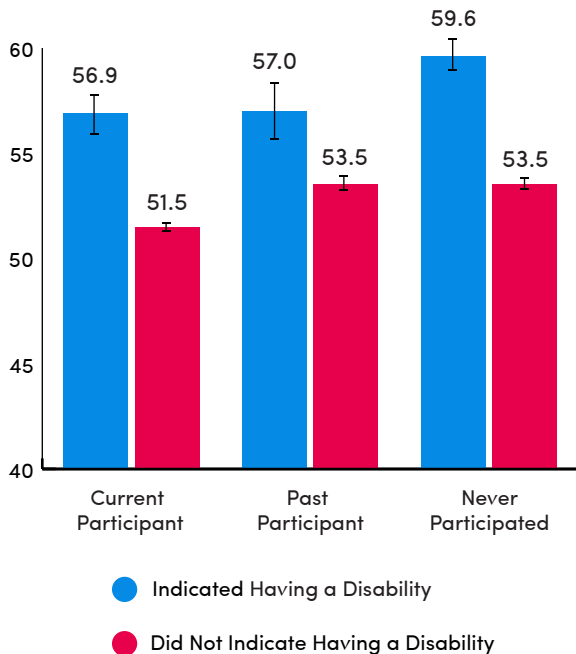
**Figure 74: Study Participants' Sport Participation, by Sexual Orientation**



Of non-sport participants, 80.6% reported identifying as heterosexual, 12.2% as LGBTQ+, and 7.2% reported that they did not know or preferred not to say. Given the significant differences between the groups, data suggest that sexual orientation still serves as a barrier to participation in sport.

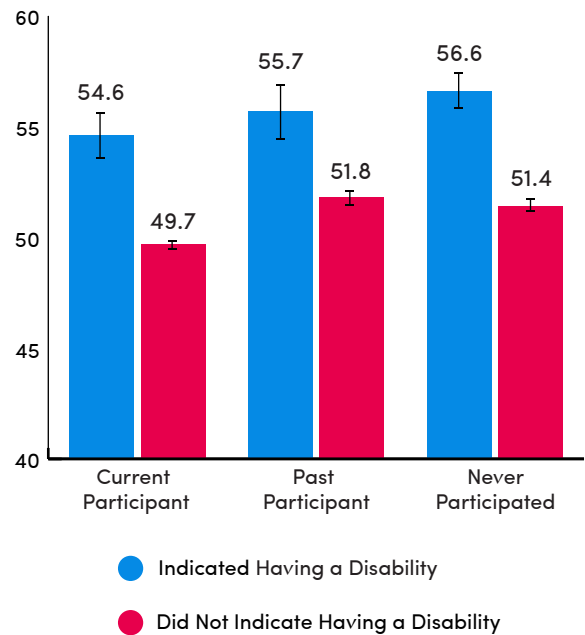
In terms of mental health benefits, data showed that, for girls with disabilities, current sport participants had significantly lower depression (Figure 75) and anxiety (Figure 76) scores, and significantly higher peer relationships (Figure 77, on following page) and meaning and purpose (Figure 78, on following page) scores than girls with disabilities who had never participated in sport. Previous research has clearly indicated a disparity when it comes to access to sport and physical activities for individuals with disabilities (Krahn et al., 2015; Martin, 2013; Rimmer, 2005; Rimmer et al., 2004). Additionally problematic is that, for adolescents, there is a lack of matriculation into higher levels of sport, given the lack of opportunities to compete at higher levels (Fines & Block, 2021; Shapiro & Pitts, 2014).

**Figure 75: Depression T-Scores by Involvement in Sport and Disability Status**



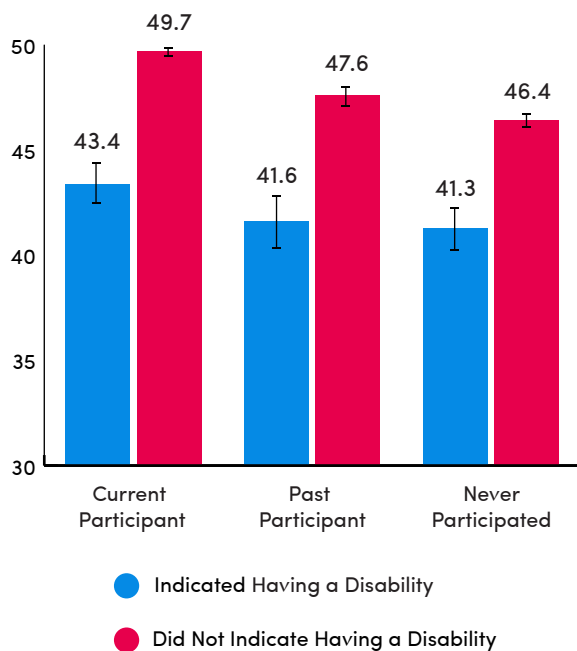
*Note: Statistical significance of 95% confidence exists between girls with and without disabilities at all levels of involvement; between current sport participants with disabilities and their peers who have never participated in sport; as well as between current sport participants without disabilities and their peers who are past sport participants and those who have never participated in sport.*

**Figure 76: Anxiety T-Scores by Involvement in Sport and Disability Status**



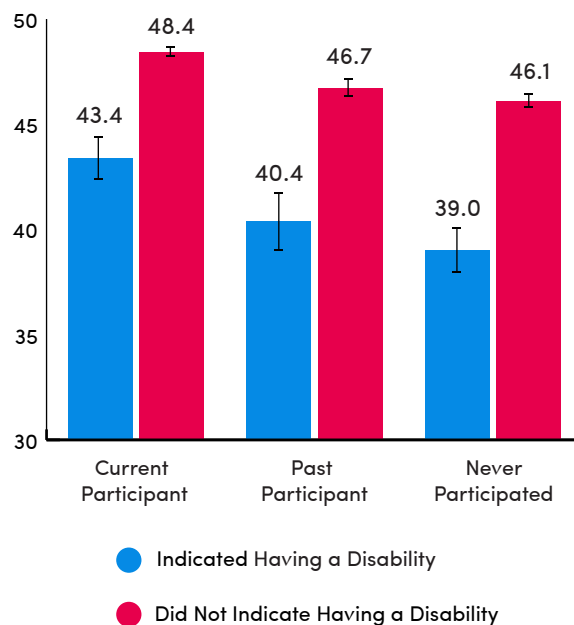
*Note: Statistical significance of 95% confidence exists between girls with and without disabilities at all levels of involvement; between current sport participants with disabilities and their peers who have never participated in sport; as well as between current sport participants without disabilities and their peers who are past sport participants and those who have never participated in sport.*

**Figure 77: Peer Relationships T-Scores by Involvement in Sport and Disability Status**



*Note: Statistical significance of 95% confidence exists between girls with and without disabilities at all levels of involvement; between current sport participants with disabilities and their peers who have never participated in sport; as well as between current sport participants without disabilities and their peers who are past sport participants and those who have never participated in sport.*

**Figure 78: Meaning and Purpose T-Scores by Involvement in Sport and Disability Status**



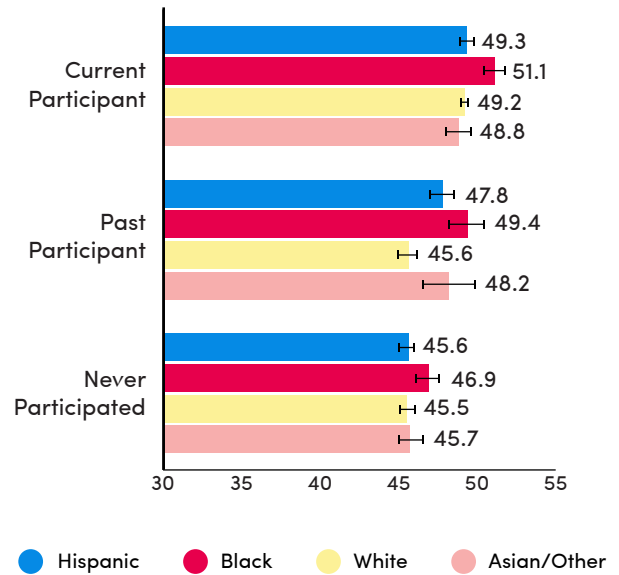
*Note: Statistical significance of 95% confidence exists between girls with and without disabilities at all levels of involvement; as well as between current sport participants with and without disabilities and their peers who are past sport participants and those who have never participated*

Yet, the current study shows there are measurable benefits for the mental health of girls with disabilities who participate in sport and supports previous findings of the benefits for sport in this population (Puce et al., 2019; Te Velde et al., 2018; Yazicioglu et al., 2012). Given the low levels of mental health in this population vis-à-vis their non-disabled peers in the study, sport should receive considerably more attention as an avenue to increase the mental health and well-being of girls with disabilities.



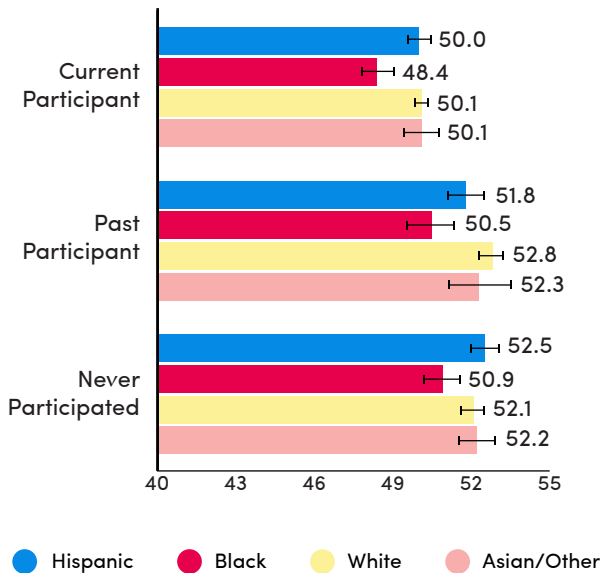
In terms of child race and ethnicity, data showed that sport participants reported better mental health outcomes than non-sport participants, regardless of racial/ethnic group status for anxiety (Figure 79), peer relationships (Figure 80, on following page), and meaning and purpose (Figure 81). The same trend held for depression (Figure 82, on following page), except for there being no difference in sport and non-sport participants on depression for those who identified with a racial identity in the “other” category. Further, sport participants who identified as Black reported lower levels of depression and anxiety, and higher levels of peer relationships and meaning and purpose than other racial/ethnic groups, suggesting that sport might be even more advantageous for girls who identify as Black. There were no differences found on any of the four mental health measures and reported household income. However, at each income bracket, girls who participated in sport reported significantly better scores than girls who did not.

**Figure 80: Peer Relationships T-Scores, by Involvement in Sport and Race**



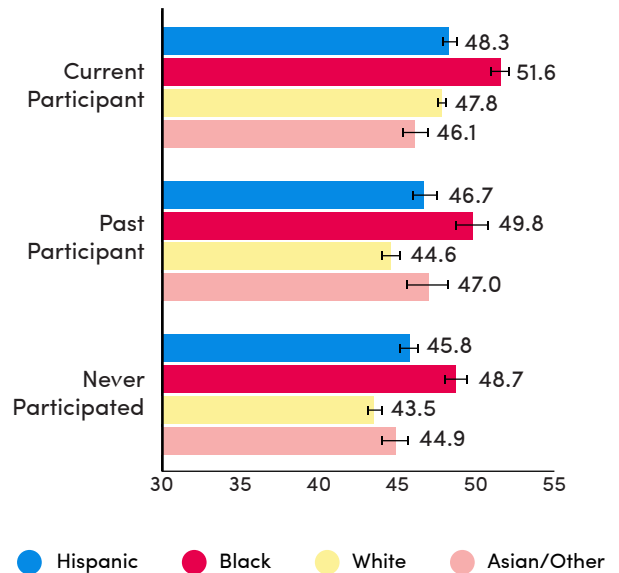
Note: Error bars that do not overlap reflect statistically significant differences.

**Figure 79: Anxiety T-Scores, by Involvement in Sport and Race**



Note: Error bars that do not overlap reflect statistically significant differences.

**Figure 81: Meaning and Purpose T-Scores, by Involvement in Sport and Race**

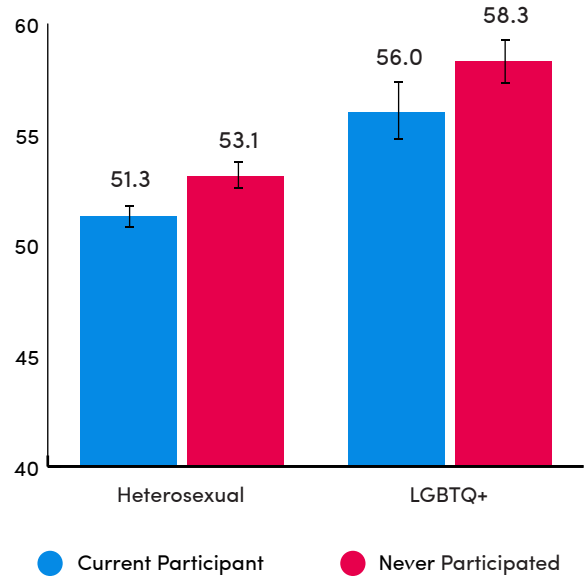


Note: Error bars that do not overlap reflect statistically significant differences.

Finally, as it relates to sexual orientation, results showed that for girls who identified as LGBTQ+, those who participated in sport had significantly lower levels of depression (Figure 83) and significantly higher levels of peer relationships (Figure 84) and meaning and purpose (Figure 85, on following page) than their non-sport counterparts. There were not statistically significant differences in anxiety scores; however, girls who identified as LGBTQ+ who participated in sport reported lower scores overall than their non-sport counterparts (Figure 86, on following page).

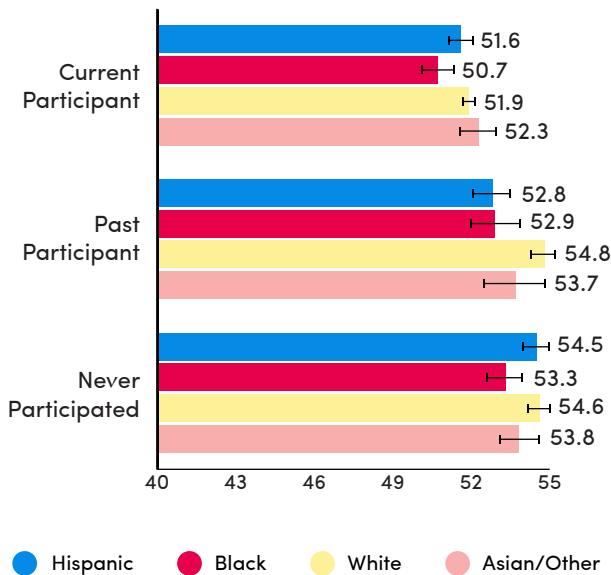
Previous research has shown that entry into sport includes several barriers for girls, particularly those with non-heterosexual identities. Given the historical roots of sport (i.e., rooted in masculinity), norms regarding gender and sexuality may cause girls to fear being seen as unfeminine when playing sport and can discourage participation in sport (Murray et al., 2021). Further, the perpetuated myth of female athletes as lesbians has been used to justify exclusion, homophobia, and microaggressions against women and lesbians in sport (Krane & Symons, 2014), which likely has a negative mental health impact. Yet despite both barriers and discrimination, sport can also be a place that supports mental health and well-being for girls who identify as LGBTQ+.

**Figure 83: Depression T-Scores by Current Sport Involvement and Sexual Orientation**



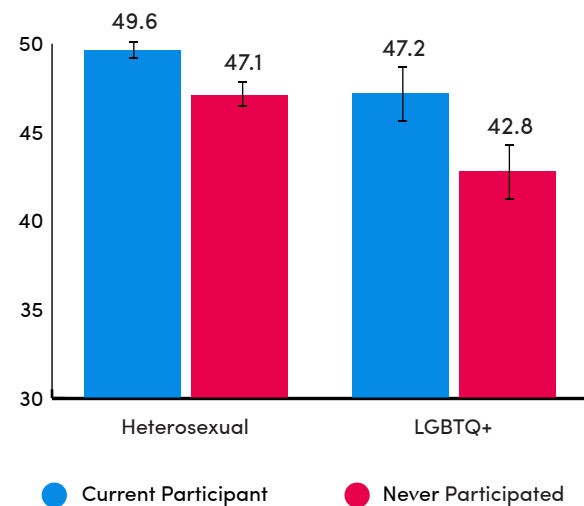
Note: Statistical significance of 95% confidence exists between all categories.

**Figure 82: Depression T-Scores, by Involvement in Sport and Race**



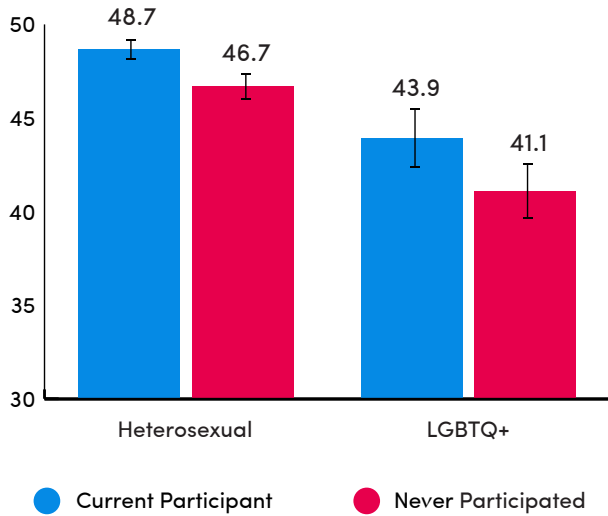
Note: Error bars that do not overlap reflect statistically significant differences.

**Figure 84: Peer Relationships T-Scores by Current Sport Involvement and Sexual Orientation**



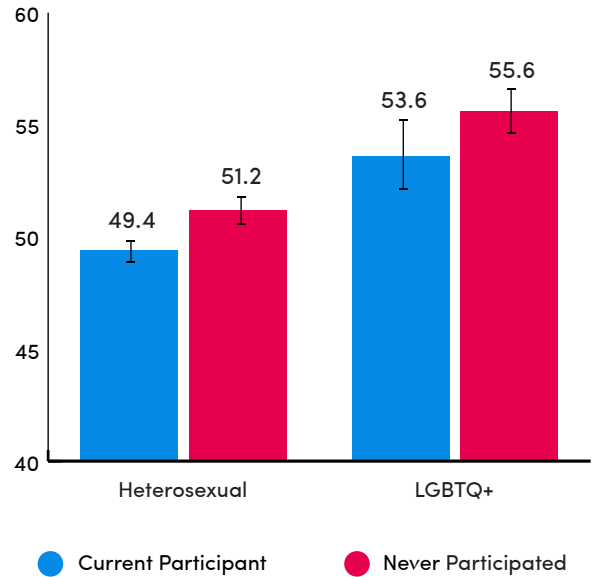
Note: Statistical significance of 95% confidence exists between all categories.

**Figure 85: Meaning and Purpose T-Scores by Current Sport Involvement and Sexual Orientation**



*Note: Statistical significance of 95% confidence exists between all categories.*

**Figure 86: Anxiety T-Scores by Current Sport Involvement and Sexual Orientation**



*Note: Statistical significance of 95% confidence exists between all categories with the exception of between LGBTQ+ participants who currently participate in sport and those who never participated in sport.*



# Section III: In Their Own Words: Themes from Focus Groups with Girl Sport Participants

## Design, Sample, and Data Analysis

From February–March 2023, eight focus groups were conducted with programs connected to the Women’s Sports Foundation. A total of 45 girls across eight focus groups from sport programs spanning the United States took part. Demographically, all of the girl participants were in either middle school or high school. Some were preparing to matriculate to university, while others had just left elementary school. Of the competition level of the eight programs, coaches in three programs reported it being “recreational,” four were “somewhat competitive,” and one was “highly competitive.” The majority of participants across the programs were Black or Hispanic, and none of the programs reported having more than 25% of girl participants from a White background. The highest percentage of girl participants with disabilities was 25%; the rest of the programs reported they had no participants, or a small percentage, with disabilities.

All focus groups were conducted by the same researcher, with a mental health expert also in attendance. For some focus groups each participant joined the virtual call separately, while some focus groups had all of the girls in-person with the researcher and mental health expert online. On each occasion, the program coach or organizer was present, helping to clarify questions and encouraging participation. The questions asked within each focus group related to how participants perceive mental health, along with the people, activities, and places that boost and worsen their own mental health. A brief activity was



conducted that encouraged the sharing of experiences related to the role of sport in boosting or worsening mental health. The final questions related to how the girls’ coaches and teammates influence their feelings of physical and emotional safety, as well as their mental health.

The focus groups were audio recorded, fed through a transcription software, and reviewed for accuracy to ensure the audio matched the transcribed text. Transcriptions were then read in full several times so participants’ stories, experiences, and unique phrases became familiar. The researcher coded each transcript by the following: (a) responses to facilitator questions, (b) comments made with conviction and/or strong emotion, (c) patterns and motifs throughout a single focus group, as well as across all focus groups, and (d) other comments and experiences related to the topics of mental health and sport. Once preliminary coding was completed for each of the eight focus groups, all of the codes were combined and grouped together by conceptual similarity (i.e., codes that were mentioned multiple times and were of significance to the research).

The main themes fall into four distinct categories: attitudes towards sports, benefits of sport, contributors to mental well-being and mental ill-being, and sport-based relationships (i.e., teammates, coaches).





## Section Summary

- Peer relationships, coach relationships, and sport culture are the primary drivers of mental health for girl sport participants.
- Accumulative pressure from having to constantly perform in school, sport, and other domains negatively impacted mental health.

## Attitudes Towards Sports

Findings point to generally positive attitudes and experiences in sport as it relates to mental health. Several girls mentioned that they are naturally competitive people and approach sport with a positive attitude. For example, one girl suggested that it was fun to compete and try to succeed: “Everything I do with sports is positive. I love, like, playing the sport, and it’s like really positive because I try to score touchdowns.” Another said, “I’m surrounded by people with the same love and passion for sports, so it’s enjoyable playing competitively.” Many others echoed this sentiment, reiterating that their overall perception of sport was positive. This is not surprising, as we spoke with girls who were actively involved in sport and often multiple sports. Previous research supports these findings, adding that positive attitudes towards sport contributes to positive experiences in sport (Collins & Barcelona, 2018) and are predictive of future engagement in sport and physical activity (Graham et al., 2011).

With that said, many girls recognized that sport was not a positive experience all of the time. Losing and not performing to their potential was an oft-cited frustration. Tiredness, and even exhaustion from multiple life obligations, including school, sport, family, and extracurricular activities, were also mentioned, which is consistent with literature on student-athletes’ well-being (Lentz et al., 2018). For instance, one girl lamented, “When I’m playing the game, I want to make my parents proud, but sometimes I forget the s, and at the end of the game, I get frustrated because I feel like I disappointed my parents by not doing what I was supposed to.” Another explained that she partly dreads training because it takes time away from other things that she wants to do, such as spending time with friends. Remembering that sport is supposed to be fun was reassuring for some girls: “When I play sports and I lose, sometimes I feel bad about it, but then like, playing sports is just to have fun. But then it also to win, too.”

**“I’m surrounded by people with the same love and passion for sports, so it’s enjoyable playing competitively.”**



In the end, the positive perceptions of sport appeared to mask the negative. One girl said about her experiences in sport: “I feel like the positive outweighs the negative a lot for me. Like those moments of laughing and running around. It’s a lot. It makes the hard parts worth it.” Another admitted, “We have days where we don’t feel like practicing, but once I actually get in there, I feel better about it.” And yet another said, “When I play sports, I’m positive, and my mental health is, like, good. And it actually, like, betters it because I get to engage with my friends if I get to play a sport with my friends.”

## Benefits of Sport

The benefits of sport appeared to be distinct, but they have a lot of overlap with “Attitudes Towards Sport.” The benefits refer to what girls get out of sport, whereas their attitudes are more related to their perception or outlook on sport in general. Most girls shared experiences where sport has boosted or helped maintain their mental well-being, as explained below. The best example of this was one girl who shared her experience with sport and anxiety: “Sports has helped me a lot with my anxiety. It gives me [the] ability to just, like, just be me; in sports you don’t really have to think. I mean, you have to think obviously, but you just go out, and you just, like, I feel like it really helps me lock in and focus on something.” A robust body of research supports the role of sport in protecting against, as well as reducing, symptoms of anxiety as well as other mental health ailments and disorders (Panza et al., 2020). Furthermore, when asked what girls were looking forward to in the coming weeks, girls from nearly every focus group mentioned they were looking forward to a sport starting back up or to a specific game or competition. This indicates a general appreciation and love for sport. Finally, many described sport as fun, an outlet for negative emotions (e.g., anger), and social time. Sport is experienced by this particular sample as a distraction from life and other stressors. For instance, sport was seen as “good to get away from things,



like, you go to practice to get away,” or “an outlet kind of, mostly for anger and stuff.” Multiple girls referred to sport as their “happy place,” indicating that sport is akin to a haven. This aligns with previous research investigating the role of sport as an “intoxicating respite from the complexities and confusions of everyday life” (Segrave, 2000, p. 61).

### Contributors to Mental Well-Being and Mental Ill-Being

The most common responses for people, activities, and places that boost girls’ mental health included physical activity, sport, or social time with family, friends, and pets. For example, one girl explained, “I talk to my friends a lot. I like talking to my friends. It helps me calm down. Like, if I’m in a stressful situation, my friends, boom! are the first ones who learn about the situation, then they help me a lot with it. ...They listen, and when I ask for it, they give me advice.” A couple of girls mentioned that they enjoy moving their bodies to boost her mental health: “I go outside to run or go to the gym or go swim or do something or just, like, be outside with my friends,” as well as “running it out” and “playing soccer.” Yet another mentioned an all-girls club at school helped because she felt it gave her a feeling of “sisterhood.” The offering by many girls of interactions with peers and family, as well as extracurricular activities, as boosters is consistent with previous literature on protective

factors for adolescent mental health (Oberle et al., 2020; Wille et al., 2008). In addition to in-person interactions, several girls spoke about their engagement in solo activities to boost their spirits, including listening to music, creating art, and reading. One shared, “Being alone while making a bracelet gives a sense of calmness. Making that bracelet is the only thing on my mind.” Others mentioned “crafting,” and “painting and drawing and stuff like that also. Or I’ll feel inspired to clean my room.” Resting, as well as staying true to oneself (e.g., “not letting things get to you”) were also mentioned as contributors to mental well-being.

When talking about factors in the girls’ lives that worsened their mental health, contributors were often framed as frustrating or annoying, rather than elements that truly negatively impact their mental health. Interestingly, experiences and people at school, such as their learning environments and how teachers or peers treat them, were the most often cited contributors to mental ill-being. “We have a lot of just certain people at the school that make me not want to be there,” one girl explained. Another shared, “academic stress is probably one of the biggest things for teenagers right now, or for most. Because I’m part of a club, the National Honor Society. It’s very demanding. So having to space out my time for that or for work or for my dog at home or for my homework, it gets very overwhelming.” When it came to family members, a handful mentioned siblings and parents (namely, fathers) who made them feel worse about themselves. Just as interpersonal interactions were seen above

as boosters for girls' mental health, scholars have noted it is also the case that such interactions can be negative and a source of stress and mental ill-being (Wille et al., 2008). One of the older girls in one focus group talked about the increasing demands of being a captain of the team and how that has impacted her: "I have more responsibility on the team, it can get a little draining, but not to the point where I'm going to quit or anything." Further, one mentioned the pressure she puts on herself worsens her mental health, "I'm really hard on myself, and that's why it's very stressful in sports, because I play travel ball and everybody's trying to get that college spot. Everybody's trying to be the best team. And so, it's just really stressful." It is unclear from this research whether these feelings of pressure and responsibility were self-imposed or imposed by parents or coaches; however, these markers of maladaptive perfectionism have been linked to increased levels of stress and ill-being (González-Hernández et al., 2019).

### Sport-Based Relationships

Coaches were a crucial element of the conversation around sport participation and mental health. Discussions of relationships with coaches were mixed across the eight focus groups. Few talked about their current sport coaches when they mentioned negative experiences; rather they shared stories of past coaches. Sport coaches were sometimes reported as "harsh," and sources of pressure through an over-emphasis on winning. Some girls did not feel emotionally safe, nor did they always get along with their coaches. In a very astute manner, one girl shared her coach may have been acting in a certain way because of the coach's own struggles: "We got a new coach, and she just seemed very miserable all the time because she was new to the school. She was not very happy with the environment she was put in with the kids that she was teaching, and so that all that kind of came off on the players." Further, one girl described that she and her teammates were yelled at under different circumstances: "I feel like maybe the coach shouldn't yell at me every time if I do something right. Some of them have been here for a long time; they should know yelling at the practice isn't going to [help] people." These negative experiences with coaches did not appear to discourage girls from continuing to play sport, but made those sport experiences negative, sometimes leading to poor performances. Such instances have been cited in literature on negative coach-athlete relationships, where poor connections with coaches can negatively impact athletes' performances (Jowett, 2017).

Current coaches, on the other hand, were spoken about in a positive light. Some were described as "understanding," "trusted," and "safe." One explained, "It's amazing to have coaches and adults on campus that we can trust and that get to see those wonderful sides of us. So, it just makes life a lot easier to live as a teenager." This poignant sentiment was felt across focus groups, too. Another girl shared, "the support that coaches provide, whether it be emotionally, mentally, physically,

they provide it really well and they show that they provide it. So, whether it's an injury or you just had a really bad day and are having a breakdown, they're going to be there for you no matter what." That most girls felt safe with their current coaches points to the importance of positive coach-athlete relationships to ensuring athletes' physical and psychological safety (Gosai et al., 2021).

In addition to coaches, teammates were another crucial sport-based relationship that interact with girls' mental health. As seen in the previous theme of "contributors to mental well-being and ill-being," peer interactions can be both helpful and harmful for adolescents. For instance, sometimes girls mentioned not getting along with their teammates, namely when teammates would get upset with them for making a mistake: "Sometimes when I miss the ball my team is like, 'why didn't you get the ball?'" Similarly, one mentioned her team as a source of pressure: "Your team puts you under a lot of pressure, and it's like you have to win. You have to do this right." Drama was another aspect of teammate relationships that girls felt was undesirable and took away from their sport experiences. Importantly, one of the girls realized that sport was bigger than any issues that may occur between teammates: "This is our sport, and we obviously want to be the best. And when we , we put those emotions [towards teammates] aside." Nonetheless, negative teammate interactions can impact team cohesion, team performance, and individual sport performance (Partridge & Knapp, 2016). Another girl mentioned that, while her teammates are distinct from her friends, during sport they are all very close. "I love my teammates. I don't see them all the time, but when we get together, we always just vent and tell stories, and it's just really fun. You experience something with them that you haven't experienced with anybody else." Another spoke about how she felt welcome in trying a new sport: "Joining the cross country team for the first time in the summer made that summer one of the funnest I've had. My teammates were supportive for my first meets." And the words of teammates, while they can hurt (see quote above), they can also boost one another: "Teammates at times they can make me feel good, make me feel confident." These sentiments mimic findings from previous literature on the association between teammate acceptance and lower levels of depression as well as higher self-esteem (Hill, 2013).

**"I love my teammates. I don't see them all the time, but when we get together, we always just vent and tell stories, and it's just really fun. You experience something with them that you haven't experienced with anybody else."**

<sup>1</sup> Note: in many of the focus groups coaches were present as they helped set up the technology for the researchers to interact with the team.

# Conclusions

Today's youth are facing increasingly high rates of mental health challenges, while rates of physical activity and sport participation continue to drop. Despite declines in participation, sport remains a popular activity among youth and has the potential to benefit both physical and mental health in young people. The current report addressed two important questions to inform youth sport policies and practice to ensure that when youth access sport, it can be designed in a way that maximizes benefit and reduces harm. First, this report set out to examine the impact of sport participation on girls' mental health with attention to both clinical mental health conditions and markers of thriving. Within this, we examined dosage and frequency of sport participation, sport participation dosage and frequency compared to other non-sport extra-curricular activities, types of sports and levels of competition, and demographic factors of participants to provide a more robust understanding of the sport participation and mental health relationship. Second, we examined how the environmental conditions of sport impacted the relationship between participation and mental

health. To accomplish this aim we assessed perceptions of the motivational climate in sport, perceptions of autonomy in the sport environment, social cohesion between teammates, and relationships with coaches. We also conducted focus groups with female sport participants to add more depth and nuance to the data we collected.

Using a nationally representative sample of children aged 9–10 years old from the ongoing Adolescent Brain and Cognitive Development (ABCD) Study (Barch et al. 2018), our findings indicated that participation in sport significantly lowered the chances of clinical mental health diagnoses across a range of mental health problems (e.g., anxiety, depression, somatic complaints, social problems, thought problems). This relationship was observed for both girls and boys and strengthened with higher dosages of sport participation (i.e., years of participation, number of sports played). However, the ABCD study is not specifically designed to investigate sport, and thus left many questions as to what drives the relationship



between sport participation and mental health outcomes. Thus, we then collected data using a nationally representative sample of girls aged 12–17 years old and their parents/guardians. Overall, our findings indicated that there was a significant and robust relationship between sport participation and the mental health and thriving of our participants. Notably, participants who were involved in sport reported more favorable scores for depression, anxiety, peer relationships, and meaning and purpose than their non-sport participant counterparts. This relationship strengthened when considering number of sports played, years of sport participation, and hours per week involved in sports. Furthermore, individual characteristics (e.g., race, sexual orientation, disability status, family income) did not drastically impact the effect sport had on mental health, nor did the type of sport or level of competition in which girls participated.

The design of the current report, notably the lack of observations across time and experimental manipulation of groups, cannot infer that sport is a causal agent in the mental health of girls. However, that (a) the relationship between sport participation and mental health strengthened with higher doses of sport; (b) the relationship between sport and mental health remained when controlling for participation in other enrichment activities; and (c) the relationship between sport and mental health was consistent across multiple types and levels of sport, provides confidence in the findings and conclusions reported within. Yet these findings highlight and reinforce a clear equity issue in sport, which also was demonstrated in the current report: While sport participation confers a range of benefits, sport participation is not equitably accessed. In the current report, girls with disabilities, girls with non-heterosexual identities, girls from racially marginalized groups, and girls from lower-income households were less likely to be sport participants than their peers who did not have marginalized identities. It is well past the time for policy makers and governmental and



non-governmental agencies to prioritize the unique needs of girls, particularly those with intersectional and marginalized identities, in terms of resource allocation, training, and access to sport. Given school-sponsored activities and community recreational programs are more accessible to youth across diverse backgrounds (Eyler et al., 2018; Sabo & Veliz, 2014), there is a need to ensure these environments are funded and supported to maximize impact.

Additionally, and of critical importance, data in this report point to the fact that sport in and of itself does not inherently support youth mental health. *Rather, sport that is designed to maximize autonomy, support positive peer and coach relationships, and promote a range of goals that include personal development, effort, fun, and connection is necessary to provide an environment supportive of mental health.* Notably, the odds of better mental health outcomes were up to 10 times greater for youth participating in high-quality sport environments (i.e., those scoring low in performance climate and high in autonomy, cohesion, and strong coach relationships) than for those in more negative environments. Further, those not participating in high-quality sport environments did not fare better, as it relates to measures of mental health, than their non-sporting peers. Perhaps not surprising to sport psychology researchers who have long reported the importance of psycho-social-motivational aspects of the sport climate, these data suggest a need to renew efforts to expand coach training and oversight beyond physical safety and risk prevention. Sport settings that emphasize mastery of skills, rather than having a sole focus on external motivations (such as winning, social comparisons, and public/social recognition) nurture a sense of purpose and are shown to foster important life skills, including strong work ethic, taking initiative and committing the time and effort needed for learning and growth, leadership and teamwork, and persistence and resilience in the face of failures/disappointments or setbacks (Gould & Carson, 2008; Goudas, 2010; Petitpas et al., 2005). Further, sport has been shown to give youth both a place to belong and people to belong to (Massey & Whitley, 2016), as well as a place of value (Blanchard et al., 2009; Edwards, 2015) all of which are critical to mitigating negative mental health issues and promoting thriving in youth.

During the stressful, and often unpredictable, journey through adolescence, sport settings can help meet the developmental, physical, and mental health needs of youth as they navigate developmental transitions. Yet a critical point is that how relationships are built and nurtured will likely determine whether sport settings provide an environment to explore a positive developmental trajectory or one that risks the potential for harm. The need for sport organizations to ensure coaches and program leaders are building sport in ways that will benefit today's youth could not be more pressing.

# Policy and Practice Recommendations

## Coaches

1. Establish physical and emotional safety from day one. Create team expectations and invite athlete input on what should be expected and how everyone should treat one another.
2. Create a positive, safe, and fun environment that builds strong connections between coach and athletes, as well as among the athletes. Create an environment where each individual athlete feels valued and a sense of belonging.
3. Create an environment that focuses on the whole person, rather than just the athlete. Demonstrate care beyond just their athletic abilities.
4. Build community outside of the athletic environment and tap into other key figures in athletes' lives, such as parents, caregivers, teachers, and mentors.
5. Ask girls what their goals are with sport. Find out what they want from the experience and what motivates them.
6. Listen to athletes' concerns and ideas. Invite input. Ask athletes what they like and what can improve. Let them lead, not just follow.
7. Model empathy. Be aware of your own biases and assumptions. Create space for athletes to share their feelings without judgment.
8. Let improvement and effort drive the culture. Ensure you are highlighting the small wins that happen every day, not just the outcomes of competition. Instead of comparisons with other athletes, encourage individual progress over time and collaborative activities in which the athletes work together to achieve success.
9. Encourage risk taking and treat mistakes as opportunities to learn, as opposed to failures.
10. Seek out ongoing learning opportunities. Creating an environment that prioritizes mental health requires ongoing development of skills and adaptation to cultural and environmental situations rather than the one-time learning of a skill set.



## Coach Training

1. Train coaches in cultural proficiency and sensitivity to create a welcoming and supportive environment for athletes from diverse backgrounds. Reinforce the benefits of how a culturally responsive positive youth sport experience can contribute to mental health.
2. Mandate that all coaches receive training on creating a sport environment that helps kids thrive physically and promotes positive mental health outcomes. Design and/or prioritize coach training that focuses on promoting autonomy, mastery, positive relationships, and psychological and physical safety.
  - a. In places where limited mandates for coach training exist (often school-based sports at the state level), add these trainings to current requirements.
  - b. In places where no mandates exist (most sport environments, including parks and recreation, community clubs and travel sports), work to implement this requirement in a way that meets the unique needs of the coaching population.
  - c. In places where there are extensive coach training systems and requirements (often sports-based youth development organizations), encourage programs to track and incentivize these trainings through a centralized system.

As examples, provided below are several training programs that local districts can adopt for mandated training on mental health in sport:

- i. Positive Coaching Alliance: “Coaching with Empathy,” “Developing Competitors through Positive Coaching”
  - ii. National Federation of High School Sports: “Sportsmanship,” “Bullying, Hazing, and Inappropriate Behavior,” and “Implicit Bias”
  - iii. The Center for Healing and Justice through Sport: “Sports-Based Youth Development,” “Trauma Informed Sport,” “Girls in Sport”
3. Institutionalize a system for tracking the credentials of youth coaches such that: 1) it is easy for a coach to share the trainings that they have completed; 2) it is easy to update a coach’s background; and 3) parents know how much training their child’s coach has received and what is mandatory. Ensure that a tracking/credentialing system has the option to publicly revoke credentials of coaches who do not meet standards.
  4. Incentivize schools and community-based organizations to ensure their coaches receive training. Consider a reward system for coaches that consistently provides high-quality sport environments for youth. Include the quality of the sport environment as part of a coach’s core evaluation and success metrics.



5. Explore resources to expand successful coach training programs and consider compensating coaches for any required additional training. Since many coaches currently work on stipend pay, it’s essential to acknowledge the added time and effort required for additional certifications and training.
6. Incentivize coaches to participate in on-going training and professional development through which they continue to hone their skills, learn and develop new strategies, and expand their understanding of how to support athletes’ mental health.

## Physical/Mental Health Practitioners

1. Encourage sport participation in supportive settings (i.e., programs that prioritize personal development as well as sport skills) as a means to promote positive mental health and thriving among all young people.
2. Learn more about the neurobiological mechanisms behind autonomy, mastery, and psychological safety in sport through certification programs like the Neurosequential Model in Sport.
3. Build on the success of ExerciseRX from the Sports Institute at the University of Washington, a platform that allows medical providers to track a patient’s physical activity levels and customize a program that will promote the development of positive habits that contribute to that patient’s physical and mental health.
4. Educate families about the broader purposes of sport beyond performance and competition to include and prioritize holistic development, mental health, and overall well-being.

5. Provide parents with insights and strategies they can apply at home to ensure a positive sport experience for their children.

### Educators

1. Advocate for training across school personnel about the benefits of sport for mental health and consider incorporating more physical activity into classroom learning.
2. Advocate for more opportunities for young people to engage in positive sport experiences and call out when those experiences are not present in your school environment.
3. Ensure that other extra-curricular activities promote autonomy, mastery, and physical and psychological safety, which contribute to positive mental health outcomes.
4. Support the expansion of educator training programs, including at the university level, to include the power of sport as a tool to promote positive mental health. Look for ways to integrate more sport opportunities as part of the overall curriculum.
5. Advocate that PE teachers receive additional training on the connection between sport and mental health.

### Family

1. Engage in conversations with children to find out their sport preferences, discuss available choices, and empower them to explore various sports.
2. Steer clear of sport specialization. The more sports your child engages in and the longer they participate, the greater the mental health benefits.
3. Encourage participation in sport settings that prioritize holistic development, well-being, and overall enjoyment of sports.
4. Seek environments that prioritize a supportive culture over an exclusively competitive one: emphasize goal setting, feature supportive coaches, and promote team dynamics even in individual sports.
5. Actively listen to your children. When they consistently voice concerns about a coach, it's crucial to recognize that coach relationships significantly impact mental health outcomes. Don't feel compelled to stick with a coach just because they claim to be the sole option in your school/community. Remember, there are always alternatives, and no child should have to endure the risk of compromised mental health for the sake of playing under a particular coach.
6. If you are able, volunteer to be a coach or assistant coach. A caring adult who prioritizes mental health can have a positive effect on the overall sport environment. Modeling a positive sport culture alongside coaches and other parents can have a big impact.

## National, State and Local Advocacy

### National Level

1. Advocate for awareness, education, and compliance with Title IX to ensure all girls benefit. Title IX legislation, which was passed in 1972, has been a catalyst for gender equity in sport. It was established to rectify deep-seated gender disparities and discrimination, granting girls and women equal access to sport in American educational institutions. Despite substantial progress, disparities still persist in sport, disproportionately affecting girls of color, LGBTQ+ youth, low-income girls, and those with disabilities. This report aligns with existing literature, which highlights the disparities in equitable sport access for girls from marginalized communities.
2. Recognize how the intersection of race, gender, and other marginalized identities impacts access disparities in sport; and prioritize equity for all:
  - a. Advocate for the modification of the U.S. Department of Education's Civil Rights Data Collection (CRDC) to include race-specific data on sport participation. Expanding the collection of athletic participation data to encompass not only gender, but also gender broken down by race and ethnicity, acknowledges the importance of intersectionality. A notable example of this approach is found in D.C. Council Code, Chapter 8C, titled "Title IX Athletic Equity." This chapter mandates that all D.C. public and charter schools report their data, considering factors such as race, ethnicity, and financial decisions. Given recent research highlighting the invisibility of marginalized girls in Title IX implementation, adopting this comprehensive approach should become the standard practice for all school districts.





- b. Advocate for the passage of the Fair Play for Women Act by the U.S. Congress, a crucial step in ensuring that all student-athletes have the same opportunities to participate and compete. The Act also would ensure transparency and public reporting of data by K-12 and college athletic programs, hold athletic programs and athletic associations more accountable for Title IX violations and discriminatory treatment, and improve education and awareness of Title IX rights among college and K-12 athletes as well as athletics staff.

### State Level

1. Educate state legislators on the role that sport participation plays in promoting positive mental health. Legislators have a pivotal role in both implementing essential policies and allocating funding for initiatives aimed at supporting these crucial objectives.
2. Emphasize, as a priority, the distribution of resources to underrepresented and low-income areas, addressing the disparities in sport participation and the associated mental health benefits.
3. Promote strong state-level oversight of gender equity in school districts, urging the state's Department of Education to proactively investigate and enforce fair practices. It's essential to recognize that inequities in access to sport

create inherent inequities in resources linked to positive mental health.

4. Champion the creation of more opportunities in sport for female athletes at the secondary school level within your state.
5. Advocate for an intersectional approach when it comes to ensuring sport access for girls.
  - a. As there is currently no federal mandate for data reporting at the secondary school level, it is essential for community members to actively advocate for state legislatures to enact legislation mandating transparency in athletic equity practices, considering factors such as sex, race, and ethnicity. D.C. Council Code, Chapter 8C, titled "Title IX Athletic Equity," can serve as a valuable model to present to the local state legislature for consideration.
  - b. Create incentives for the development of community-based sport programs that specifically address the lower participation rates of girls who identify as Black, Hispanic, or other races, as highlighted in the report. These data show a significant gap in sport participation between these groups and their White counterparts.
  - c. State initiatives might include grants for community sport programs that focus on marginalized/



©Black Girls Tennis Club — Photo by Kimberly Salden

underrepresented groups, funding for schools and local organizations to establish culturally relevant sport programs, or partnerships with community groups to develop initiatives that specifically engage and support girls of color in sport.

6. Reach out to your state's high school athletic association to:
  - a. Advocate for policies that ensure equitable access and opportunities in sports for female student-athletes, with a focus on inclusivity of those from marginalized backgrounds.
  - b. Encourage the adoption or expansion of unified sport programs within state athletic associations to foster inclusivity in interscholastic sports. Unified sport integrates students with and without intellectual disabilities onto the same team, promoting teamwork, camaraderie, and mutual respect. In states where unified sport programs are absent, advocate for their establishment to ensure that students with disabilities have equitable opportunities for athletic participation. For states already offering unified sport, advocate for further expansion to include interscholastic sport opportunities specifically tailored for students with physical disabilities, thereby promoting inclusivity across a broader spectrum of abilities.
  - c. Ensure diligent oversight of Title IX compliance and gender equity metrics within member schools. Seek information regarding their annual equity reports to ascertain if girls receive equal access to sport, thus enabling them to access the significant mental health benefits associated with sport participation.

## Local Level

1. Advocate for equitable treatment in interscholastic athletics. Reach out to local administrators to emphasize community concerns about decision-making in sport programs.
2. Advocate for transparency in the allocation of financial resources for sport opportunities, ensuring equity from both gender and intersectionality perspectives. This includes advocating for the expansion and implementation of sport programs tailored for students with disabilities. If your local school district does not currently offer unified sport and/or adaptive sport, this presents a prime opportunity to engage policymakers and advocate for the inclusion of such programs, promoting inclusivity and equal access to sport for all students.
3. Encourage local policymakers to expand girls' access to sport opportunities, driven by the report's findings that establish a direct link between sport participation and positive mental health outcomes.
4. Recommend the use of interest surveys to gauge young girls' sport preferences and ensure that these preferences are met with corresponding offerings in their community. If



certain sports are missing, advocate for their introduction to provide comprehensive options.

5. Encourage and facilitate direct input from low-income and marginalized communities, focusing on girls who are underrepresented in sport, such as those of color, with low incomes, and with disabilities.
6. Advocate for policies that drive increased parent and caregiver engagement in their children's sports activities. This involves creating inclusive, accessible opportunities for parents to support their children's sport participation and fostering a community that values parental involvement.
7. Build and strengthen partnerships with local leaders and organizations in low-income communities to support increased sport participation.
8. Establish community sport advisory committees with diverse community representation to ensure sport facilities meet the unique needs of all community members, focusing on accessibility and cultural relevance.
9. Suggest yearly evaluation via surveys, interviews, etc., to regularly assess sport programs for their effectiveness in addressing equity, and refine policies based on community feedback, ensuring that these programs effectively serve marginalized communities, continue to be accessible and meet community needs.
10. Advocate for compliance with state regulations for physical education programs across all school districts. Given that access remains a significant barrier to sport participation, it's imperative for schools to provide opportunities within their physical education departments. This entails ensuring adherence to state mandates by local school districts and securing additional funding to enhance sport opportunities in both secondary and elementary schools. By prioritizing compliance and allocating resources effectively,



policy-makers can promote equitable access to sport and physical activity for all students.

### Future Research

This report outlines many possible avenues for future research on public policy, the conditions of equality and participation, and the impact of mental health. Examples include:

1. Explore further the impact of specific sport environments on the mental health of girls, aiming to uncover whether distinct settings yield varying mental health outcomes. These specific sport environments encompass secondary school settings, youth organizations, as well as competitive academy or club programs.
2. Conduct targeted research on the characteristics of performance- vs. mastery-driven youth sport climates, including their prevalence and key features. Explore where these differing environments exist and their impact on athletes.
3. Conduct focused research to explore the impact of a coach's gender on the mental health outcomes of female athletes. The national underrepresentation of women in coaching positions is a persistent issue, and the majority of female athletes may go through their entire sporting careers without ever being coached by a woman. There is an urgent need for research to investigate the effects of this lack of representation on young female athletes and their mental health.
4. Conduct targeted research within highly competitive sport environments, where winning is of utmost importance, with a specific focus on strategies to enhance the mental health outcomes of female athletes in these sport environments.
5. Conduct research pertaining to K-12 girl athletes, encompassing challenges related to equity, sport access, and mental health, with a particular emphasis on BIPOC girls, girls with disabilities, and those in low-income communities.
6. Conduct research to determine the most effective methods for educating coaches, athletic directors, family members, and athletes about the findings and implications of this report regarding mental health in sport.

# Appendix: Measures Index

## Non-Sport Activities

Which activities have the children listed below participated in during their lifetime?

- <1> Music
- <2> Acting/singing/performing arts
- <3> Dance
- <4> Girl/Boy Scouts
- <5> Community service activities
- <6> Religious education
- <7> After-school academic tutoring or enrichment
- <8> Art/drawing lessons
- <9> School clubs (school government, chess club)
- <10> Sports/athletic activities
- <98> None of these

And in which activities does your child currently participate or plan to participate in the next year?

- <1> Music
- <2> Acting/singing/performing arts
- <3> Dance
- <4> Girl/Boy Scouts
- <5> Community service activities
- <6> Religious education
- <7> After-school academic tutoring or enrichment
- <8> Art/drawing lessons
- <9> School clubs (school government, chess club)
- <10> Sports/athletic activities
- <98> None of these

For each activity listed, please complete the following:

Activity	Age Started	Age Stopped	Hours Spent on Activity per Week (including any practice/work at home outside of organized activity)
INSERT ALL ITEMS SELECTED	RANGE 0–CURRENT AGE	RANGE 0–CURRENT AGE	RANGE 1–70

## Sport Activities

Which organized sports has your child participated in during their lifetime?

- <1> Archery
- <2> Baseball/Softball
- <3> Basketball
- <4> Cheerleading
- <5> Crew
- <6> Dance
- <7> Equestrian
- <8> Field hockey
- <9> Football
- <10> Golf
- <11> Gymnastics
- <12> Ice hockey
- <13> Ice skating
- <14> Lacrosse
- <15> Martial arts (karate, taekwondo, etc.)
- <16> Rugby
- <17> Soccer
- <18> Swimming/Diving
- <19> Tennis
- <20> Track and field/Cross country
- <21> Water polo
- <22> Weightlifting
- <23> Wrestling
- <24> Volleyball
- <99> Other (Please specify)



For each sport that your child has ever played, please enter how old they were when they started playing organized sports and when they stopped. Here we are not referring to a season ending, but to a decision being made that they would no longer play that sport. There is also a column to say how many hours are spent per week.

Regarding the frequency of playing or participating, please think only about your child's **most recent**, active season for the sport and please include practices along with games/competitions.

Please enter your best estimate, using whole numbers.

Activity	Age Started	Age Stopped	Hours Spent on Activity per Week (including any practice/work at home outside of organized activity)
INSERT ALL ITEMS SELECTED	RANGE 0–CURRENT AGE	RANGE 0–CURRENT AGE	RANGE 1–70

For each sport listed, please select the options that best describe the level your child currently s? Select all that apply for each sport.

- <1> Community/Recreational
- <2> Middle School Sports
- <3> Competitive Club/Travel Team
- <4> Freshman High School
- <5> Junior Varsity (JV)
- <6> Varsity

How many head injuries has your child experienced as a result of playing or participating in an organized sport or athletic activity?

### Child and Family Demographic Information (Parent Report)

What is the highest level of education you have completed?

- <1> Did not graduate from high school
- <2> High school graduate
- <3> Some college, but no degree (yet)
- <4> 2-year college degree
- <5> 4-year college degree
- <6> Postgraduate degree (MA, MBA, MD, JD, PhD, etc.)

What is your marital status?

- <1/"Married"> Married, living with spouse
- <2> Separated
- <3> Divorced
- <4> Widowed
- <5/"Single"> Single, never married
- <6> Domestic partnership

What is your zip code?

How would you describe the place where you live?

- <1> City
- <2> Suburb
- <3> Town
- <4> Rural area
- <5> Other

S9. Thinking back over the last year, what was your family's annual income?

- <1> Less than \$10,000
- <2> \$10,000–\$19,999
- <3> \$20,000–\$29,999
- <4> \$30,000–\$39,999
- <5> \$40,000–\$49,999
- <6> \$50,000–\$59,999
- <7> \$60,000–\$69,999
- <8> \$70,000–\$79,999
- <9> \$80,000–\$99,999
- <10> \$100,000–\$119,999
- <11> \$120,000–\$149,999
- <31> \$150,000 or more
- <97> Prefer not to say

How many children do you have in each of the following age groups? Please enter a whole number in each space.

- <1> 0–5 \_\_
- <2> 6–11 \_\_
- <3> 12–17 \_\_\_\_

For each child **aged 12–17**, please fill out each field. We are only asking for your child's name to make asking you questions about that specific child easier. Feel free to use a nickname or first initial only.

All information provided remains anonymous and any information regarding your child will never be associated with the name you provide.

Please enter information for your 5 oldest children.

Child Name or First Initial	Age	Sex Assigned at Birth	Gender Identity	Ethnicity	Race
	Dropdown: 12, 13, 14, 15, 16, 17	Boy Girl	Boy Girl Non-binary Other	Yes No	White Black or African American American Indian or Alaska Native Asian Native Hawaiian or Pacific Islander Two or more races, or other

Does your child identify as a D/deaf or disabled person, or have a long-term health condition (i.e., physical, visual, auditory, cognitive/mental, emotional, or other)? Again, please note that your responses will never be associated with you or your child, and all data is only reported in aggregate.

- <1> Yes
- <2> No
- <97> Prefer not to say

### Child Sports Background

Below are the current organized sports your parent/guardian mentioned you take part in.

Which organized sport would you consider your primary sport?

For the next few questions, think about your primary sport team members and coach/program leader. If there was more than one coach/program leader, please answer about the head coach/program leader or coach/program leader you spent the most time with.

Was your coach/program leader...

- <1> Male
- <2> Female
- <3> Non-binary
- <99> Other



### Motivational Climate Scale For Youth Sports

Pick the response that sounds most like what your team members/coach/program leader.

**Response Options**

- <1> Never
- <2> Almost never
- <3> Sometimes
- <4> Often
- <5> Almost always

**Question Prompts**

- <1> Winning games/competitions was the most important thing for the coach/program leader.
- <2> The coach/program leader spent more time with the team members who were more skilled.
- <3> The coach/program leader told us which team members on the team were the best.
- <4> The coach/program leader paid most attention to the best team members.
- <5> Team members were taken out of games if they made a mistake.
- <6> Coach/program leader told us to try to be better than our teammates.

### Coach/Program Leader-Athlete Relationship Questionnaire

**Response Options**

- <1> Strongly disagree
- <2>
- <3>
- <4> Neither disagree or agree
- <5>
- <6>
- <7> Strongly agree

**Question Prompts**

- <1> I like my coach/program leader.
- <2> I trust my coach/program leader.
- <3> I respect my coach/program leader.
- <4> I appreciate the sacrifices my coach/program leader makes.

## Youth Sport Environment – Social Cohesion

### Response Options

- <1> Strongly disagree
- <2>
- <3>
- <4>
- <5> Neither disagree or agree
- <6>
- <7>
- <8>
- <9> Strongly agree

### Question Prompts

- <1> I invite my teammates to do things with me.
- <2> Some of my best friends are on this team.
- <3> We hang out with one another whenever possible.
- <4> I contact my teammates often (phone, text message, social media).
- <5> I spent time with my teammates outside of sport.
- <6> I am going to keep in contact with my teammates after the season ends.

## Autonomy Needs Satisfaction In Sport

### Response Options

- <1> Strongly disagree
- <2>
- <3>
- <4> Neither disagree or agree
- <5>
- <6>
- <7> Strongly agree

### Question Prompts

- In my sport, I...
- <1> Feel free to make choices with regards to the way I train
  - <2> Have a say in how things are done
  - <3> Have the freedom to make training decisions
  - <4> Pursue goals that are my own
  - <5> Feel like I can be myself

## Child Mental Health Questions

### PROMIS – Pediatric Depression

Next, we have a few questions about how you have felt over the past week.

In the past 7 days, which option best describes how often each of the following items happened?

### Response Options

- <1> Never
- <2> Almost Never
- <3> Sometimes
- <4> Most of the Time
- <5> Always

### Question Prompts

- <1> I could not stop feeling sad
- <2> I felt alone
- <3> I felt everything in my life went wrong
- <4> I felt like I couldn't do anything right
- <5> I felt lonely
- <6> It was hard for me to have fun
- <7> I felt sad
- <8> I felt unhappy

### PROMIS – Pediatric Anxiety

In the past 7 days, which option best describes how often each of the following items happened?

### Response Options

- <1> Never
- <2> Almost Never
- <3> Sometimes
- <4> Most of the Time
- <5> Always

### Question Prompts

- <1> I felt like something awful might happen
- <2> I felt nervous
- <3> I felt scared
- <4> I felt worried
- <5> I worried when I was at home
- <6> I got scared easily
- <7> I worried about what could happen to me
- <8> I worried when I went to bed at night

## PROMIS – Pediatric Peer Relationships

In the **past 7 days**, which option best describes how often each of the following items happened?

### Response Options

- <1> Never
- <2> Almost Never
- <3> Sometimes
- <4> Most of the Time
- <5> Always

### Question Prompts

- <1> I felt accepted by other kids my age
- <2> I was able to count on my friends
- <3> I was able to talk about everything with my friends
- <4> I was good at making friends
- <5> My friends and I helped each other out
- <6> Other kids wanted to be my friend
- <7> Other kids wanted to be with me
- <8> Other kids wanted to talk to me

## PROMIS – Pediatric Meaning And Purpose: 4 Items

Thinking about your life, how much do you agree with each statement?

### Response Options

- <1> Not at all
- <2> A little bit
- <3> Somewhat
- <4> Quite a bit
- <5> Very much

### Question Prompts

- <1> I feel hopeful about my future
- <2> I can reach my goals in life
- <3> My life is filled with meaning
- <4> My life has purpose

**Supplemental Table 1: Descriptive Statistics Reliability Scores for Study Constructs**

	# of Items	Mean	Standard Deviation	Cronbach's Alpha
Depression <sup>a</sup>	8	52.67	8.51	.936
Anxiety <sup>a</sup>	8	50.58	8.52	.929
Peer Relationships <sup>a</sup>	8	48.14	9.28	.928
Meaning and Purpose <sup>a</sup>	4	47.63	9.33	.899
Autonomy <sup>b</sup>	5	25.52	6.22	.851
Ego Climate <sup>b</sup>	6	14.93	5.47	.849
Social Cohesion <sup>b</sup>	6	38.73	13.14	.951
Coach Relationships <sup>b</sup>	4	24.10	4.59	.922

<sup>a</sup>Means and standard deviations are based on the PROMIS t-Scores

<sup>b</sup>Means and standard deviations are based on sum scores



**Supplemental Table 2: Correlation Matrix for Study Constructs**

		PROMIS Pediatric Depression Score	PROMIS Pediatric Anxiety Score	PROMIS Peer Relationship Score	PROMIS Meaning and Purpose Score	Autonomy	Ego Climate Score	Social Cohesion Score	Coach- Athlete Relationship Score
PROMIS Pediatric Depression Score	Pearson Correlation	1	.752**	-.455**	-.534**	-.272**	.189**	-.199**	-.244**
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	2956	2956	2956	2956	1892	1892	1892	1892
PROMIS Pediatric Anxiety Score	Pearson Correlation	.752**	1	-.398**	-.456**	-.193**	.195**	-.121**	-.236**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.000	0.000
	N	2956	2956	2956	2956	1892	1892	1892	1892
PROMIS Peer Relationship Score	Pearson Correlation	-.455**	-.398**	1	.554**	.335**	-.099**	.384**	.279**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	N	2956	2956	2956	2956	1892	1892	1892	1892
PROMIS Meaning and Purpose Score	Pearson Correlation	-.534**	-.456**	.554**	1	.342**	-.057*	.281**	.324**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.014	0.000	0.000
	N	2956	2956	2956	2956	1892	1892	1892	1892
Autonomy	Pearson Correlation	-.272**	-.193**	.335**	.342**	1	-.102**	.457**	.472**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000	0.000
	N	1892	1892	1892	1892	1892	1892	1892	1892
Ego Climate Score	Pearson Correlation	.189**	.195**	-.099**	-.057*	-.102**	1	0.039	-.295**
	Sig. (2-tailed)	0.000	0.000	0.000	0.014	0.000		0.090	0.000
	N	1892	1892	1892	1892	1892	1892	1892	1892
Social Cohesion Score	Pearson Correlation	-.199**	-.121**	.384**	.281**	.457**	0.039	1	.347**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.090		0.000
	N	1892	1892	1892	1892	1892	1892	1892	1892
Coach-Athlete Relationship Score	Pearson Correlation	-.244**	-.236**	.279**	.324**	.472**	-.295**	.347**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	N	1892	1892	1892	1892	1892	1892	1892	1892

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

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