

AN EXAMINATION OF BURNOUT, SPORT COMMITMENT, AND INJURY
IN COLLEGIATE, ELITE, AND OLYMPIC LEVEL
MALE AND FEMALE GYMNASTS

by

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ABSTRACT

Objective: According to the Association for Applied Sports Psychology, 47% of individuals who compete in athletics reported feeling burned out at some point in their athletic career (Silva, 1990). The purpose of the current study was to examine athlete demographics, sport commitment, and injury in relation to burnout amongst collegiate, elite, and Olympic level male and female gymnasts. **Design:** This survey study design consisted of participants completing a series of demographic questions, the Athlete Burnout Questionnaire (ABQ), and the Sport Commitment Model Scale. After completion of the survey, a data analysis was conducted to examine the relationship between variables. **Setting:** This survey took place online via Qualtrics. **Participants:** 152 gymnasts (female = 102, male = 50). **Main Outcome Measures:** The percentage of participants experiencing symptoms of burnout and the potential contributors. **Results:** 17.76% of participants were experiencing burnout in one dimension at the time of the survey. There was a negligible correlation, but significant relation between burnout and the number of hours trained in ($r = .282, p = .001$) and out ($r = .237, p = .004$) of season. In addition, 48.1% of currently injured gymnasts were experiencing symptoms of burnout in one or more dimensions, however it was a negligible correlation ($r = .237, p = .004$). **Conclusion:** Understanding the effects of burnout in athletes is essential to successfully identifying the characteristics of burnout to help athletes and coaches identify interventions to improve sport enjoyment and competition at the highest level. Although the study had limited moderate to high correlations, results were significant and further research should be conducted.

Keywords: burnout, sport commitment, injury, gymnastics

INTRODUCTION

Burnout is a psychological and physiological response to overtraining that makes it difficult to maintain a high level of competition and optimal performance. Burnout often involves emotional and physical exhaustion, reduced sense of accomplishment, and sport devaluation (Eklund & DeFreese, 2015; Fender, 1989; Raedeke, 1997; Radeke & Smith, 2001). Current studies in youth and recreational settings reveal a relationship between burnout and injury and how the effects of burnout could potentially disrupt an athlete's path toward success by affecting their desire to participate in sport (Moen. Et. Al., 2016). In addition to physical injury, overtraining and burnout can be related to other negative outcomes such as lack of enjoyment, anxiety, amotivation, high perceived stress, mood disturbance, and impaired health (Gustaffsson et.at., 2017).

Understanding the effects of burnout on collegiate, elite, and Olympic level athletes is necessary to develop training programs, rehabilitation techniques, and interventions to improve physical well-being and overall longevity and success in sport. Sports psychologists have asserted athletes are vulnerable to developing burnout to the extent that they experience chronic levels of psychosocial stress and shifts in the quality and level of their sport enjoyment and motivation (Gustafsson et al., 2018). As burnout increases, the level of sport enjoyment may decrease, leading to decline in sport commitment and diminished physical and mental well-being in collegiate, elite, and Olympic level gymnasts. If an athlete has a history of injury, we predict the ramifications of overtraining may directly correlate with an increased rate of burnout (Grylls & Spittle, 2008). Increasing the awareness and recognition of burnout may aid athletes and coaches in implementing preventative measures to promote healthy athletic careers.

With an apparent increase in burnout rates of elite athletes within the last three decades, the need for further research is essential to validate training and competition regimens developed by coaches, managers, and sporting organizations (Gustafsson, DeFreese, & Madigan, 2017). The purpose of this research study was to examine the relation between burnout, sport commitment, and injury history in collegiate, elite, and Olympic level male and female gymnasts. Understanding the characteristics of burnout may help athletes and coaches identify interventions to improve sport enjoyment and competition at the highest level. This study focused on three main research questions in relation to burnout amongst the collegiate, elite, and Olympic level gymnast population. Research questions comprised of the following: 1) Is there a relationship between demographic variables of age, gender, years of competition, discipline of gymnastics, and hours trained in and out of season and burnout? 2) What components of sport commitment predict burnout? 3) Is there a relationship between current and previous injury history and burnout?

REVIEW OF LITERATURE

Background

This review of literature will introduce the three dimensions of burnout and the role they may play in influencing the success of an individual's participation in sport. Researchers often group the characteristics of burnout in sport into three categories: 1) emotional and physical exhaustion, 2) reduced sense of accomplishment, and 3) sport devaluation. The relation of burnout and an individual's commitment to their sport, levels of sport enjoyment, and injury will also be addressed. Gender differences and demographic comparisons amongst levels of competition in sport (youth/recreational, club, collegiate, elite/Olympic) will be presented to understand the demands of sport participation at the highest level and the influence early sport specialization may have on psychological and physical health.

Development of Burnout Models

The widely accepted concept of burnout was developed by Maslach and Jackson and emphasized the determinants of burnout could be attributed to psychological and physical stressors (Maslach, 1993). Maslach and Jackson designed the Maslach Burnout Inventory measure to assess burnout syndrome in various human service occupations (Szigeti et al., 2016). Concepts regarding burnout in sport stemmed from the relation of an athlete's negative adaptations to psychophysiological stress that ultimately were hypothesized to result in an overall reduction in performance (Silva, 1990). Due to the various contributors of burnout and unique individual characteristics, the challenge of determining the prevalence of burnout is rooted in psychometric difficulties (Ahola et al., 2006). With no uniform definition for burnout, researchers often derive new explanations and instruments to assess athlete burnout. The most

commonly used construct to evaluate athlete burnout is currently Raedeke and Smith's (2001) model. Raedeke and Smith's model illustrates burnout as a progressive, multidimensional syndrome involving physical and psychological exhaustion, reduced sense of accomplishment, and sport devaluation (Russell, 2021). Researchers in this area indicate the critical need for continued studies focusing on training volume to better understand how this may influence burnout in sport (Creswell & Eklund, 2006; Gustafsson et al., 2007).

Dimensions of Burnout

Emotional and Physical Exhaustion

The first dimension of burnout is often referred to as the core dimension of burnout and includes emotional and physical exhaustion. Emotional exhaustion refers to psychosocial stressors, while physical exhaustion is the exertion of energy used to perform training and competition demands within the parameters of sport (Raedeke & Smith, 2009). Defining characteristics of this burnout dimension consist of individuals exhibiting tiredness, fatigue, frustration, and lack of motivation (Cresswell & Eklund, 2006).

Reduced Sense of Accomplishment

The second dimension of burnout in sport is reduced sense of accomplishment and is associated with feelings of inadequacy. Typically, feelings of accomplishment serve as a positive influence on learning persistence, engagement, motivation, satisfaction and achievement (Tang et al., 2021; Luo et al., 2022; Feraco et al., 2022; Wu et al., 2022). Individuals who are experiencing a reduced sense of accomplishment tend to evaluate oneself negatively in terms of sport performance and accomplishments (Raedeke & Smith, 2009). Studies in youth and recreational settings indicate the effects of burnout could potentially disrupt an athlete's path

toward success by affecting their desire to participate in sport (Moen. et. al., 2016). In addition, athletes experiencing a high degree of burnout reported negative reflections on their athletic careers and involvement in sport (Goodger et al, 2007). A reduced sense of accomplishment can lead to inconsistencies and lack of improvement (Creswell et al., 2006), reduced confidence (Silva 1990), and a cost and reward imbalance represented through frustration (Goodger, 2007).

Sport Devaluation

The third dimension of burnout is sport devaluation and is often referred to as depersonalization. When devaluing a sport, athletes may present physical and emotional indicators of burnout such as a lack of focus, perception of little benefit to participation, doubts of purpose in engagement of sport, and unwillingness to reflect and learn from past performances (Creswell et al., 2006). Burnout is often characterized as a transition from passionate engagement in sport to involvement underpinned by an absence of motivation, if not withdrawal from sport altogether (Cresswell et al., 2005, Gould, 1996).

Sport Commitment and Burnout

Sport commitment is often defined as a psychological construct representing the desire and resolve to continue sport participation (Scanlan et al., 1993a). The model of sport commitment developed by Scanlan, and her colleagues suggests sport enjoyment, involvement alternatives, personal investments, social constraints, and involvement opportunities influence an athlete's commitment to their sport. Sport enjoyment is defined as a positive affective response to the sport experience that reflects generalized feelings such as pleasure, liking, and fun. Involvement opportunities are referred to as the attractiveness of the most preferred alternatives to continued participation in the current endeavor. Personal investments are represented by

personal resources that are put into the activity which cannot be recovered if participation is discontinued. Social constraints resemble the social expectations or norms which create feelings of obligation to remain in the activity. The final construct often contributing to sport commitment is involvement opportunities which are valued opportunities that are present only through continued involvement.

Burnout and Injury

According to the American Medical Society for Sports Medicine, there is limited knowledge regarding the correlation between burnout and injury (DiFiori, Benjamin, & Brenner, 2014). Whether participating at the recreational level or as an elite-caliber athlete, the prevalence of injury in sport is a natural occurrence. Researchers collected data on injury rates amongst participants from the U17 and U19 European and World Soccer Championship teams to understand the prevalence of injuries in both training and competition settings. Data revealed training injury rates ranged from 1.1 to 7.4 injuries every 1,000 hours, while during competition and games the rates ranged from 11.7-88.1 injuries for every 1,000 hours (Hägglund, Waldén, & Ekstrand 2004-2008). Depending on the severity of an injury, athletes may be removed from practice and competition settings temporarily or permanently. If given medical clearance to return to the field of play, athletes are not guaranteed to return to the level they were pursuing prior to the time of the injury.

Often when returning to sport, athletes continue to experience impairments from their previous injuries potentially restricting their overall performance capabilities. Athletes with musculoskeletal injuries have demonstrated increased negative emotional responses, such as anxiety, fear, confusion, isolation, and depression (Lichtenstein, Gudex, Andersen, Bojesen, &

Jorgensen, 2019). One study indicated 50% of patients with anterior cruciate ligament repairs (ACLR) did not return to sport due to fear of reinjury (Flanigan, Everhart, et al., 2013). The demands and exhaustion of rehabilitating from an injury may result in negative emotions such as the devaluation of sport or loss of desire to participate. Continued research on the effects of injury, both current and previous, in relation to burnout can help coaches, athletic trainers and other healthcare providers identify appropriate and effective intervention strategies.

Implementing these individualized strategies may assist in the retention of an athlete's commitment to their sport and a continued desire to compete.

Demands of Gymnastics

Specialization at Young Age

Individuals who reach the pinnacle level of sport have often been solely participating and training in that specific sport since childhood. High levels of performance and success are achieved through years of engagement and deliberate practice in structured environments from a young age (Ericsson & Starkes, 2003). Researchers have reported children who participate in gymnastics have earlier rates of specialization and begin specializing around age nine (Pasulka et.al, 2017). In addition to higher rates of early specialization, gymnasts tend to have higher training volumes than athletes in other individual or team sports, with elite female gymnasts training year around for up to 36 hours a week (Caine et., al, 2003). Young athletes who specialize in one sport often start their sporting career highly motivated; however, after several years of a competitive drive for success, the sport may become a central aspect of their identity (Martin & Horn, 2013). The sport of gymnastics demands high levels of specific posturing, movement quality, and coordination requiring gymnasts to use a combination of motor skills,

control, balance, and strength (Root et al., 2019). Due to the complexity of gymnastics skills and equipment used, concerns have been raised regarding how sport specialization can increase the risk of overuse injury and burnout in gymnastics.

Training Loads

With the demanding nature of elite level gymnastics, athletes may feel trapped within their training and competition environments resulting in continued involvement despite decreased levels of enjoyment. To succeed at the highest level of sport, athletes must train from a young age, engage in intensive training almost daily, and compete year-round (Gould & Whitley, 2009). Although minimal research has examined the exact causes of burnout, athletes may be vulnerable to the syndrome due to high training and competitive demands and long training sessions (Gustafsson, Kenttä, Hassmén, & Lundqvist, 2007). Elite level gymnasts usually practice two sessions a day up to four hours each session. Overall, they typically train around 20 hours per week and in peak seasons they may train 30 to 40 hours per week with only one rest day (Malina et al., 2013). Studies have shown a positive association between training demands and burnout (Cresswell & Eklund, 2006), while others have found a negative association (DeFreese & Smith, 2013), or no association at all (Gustafsson et al., 2007). Because athletes are experiencing an imbalance between high levels of training and low levels of recovery time, they are considered to have an increased risk of burnout (Lower-Hoppe et al., 2022). When requiring high demands and excessive training hours with a lack of enjoyment or decreased desire to participate, gymnasts may experience a loss of enthusiasm, question their career goals, and may perceive little to no benefit or purpose in participating. A gymnast may experience burnout when experiencing these negative characteristics. Some gymnasts will try to overcome this obstacle while others may withdraw from sport.

Physical Injury Prevalence

Competing at the highest level in any sport requires a high level of investment regarding training intensities and time spent in practices and competition. This may lead to consequences of overtraining, resulting in burnout and injuries (Gustaffson, Hassmén, Kenttä, & Johansson, 2008; Meeusen et al., 2013). Gymnasts have significant risk for injury because of the intense coordination, spatial awareness, and musculoskeletal capabilities required to execute high-level skills on various pieces of equipment. A study by the USA Gymnastics medical staff at the Women's Artistic Gymnastics National Championships from 2002-2004 evaluated the prevalence of injury amongst elite gymnasts. Data from this study indicated 44.9% to 71.7% of the registered competitors were treated for 16 different types of injuries, with 11% requiring surgery (Caine et. al 2005). With gymnastics being a sport that is constantly evolving, defies the odds of gravity, and increases the level of difficulty of skills performed every year, the margin of error for serious injury is considerable. Experiencing an injury may lead many talented gymnasts to retire prematurely or withdraw from the sport.

Summary

Burnout is characterized by emotional and physical exhaustion, reduced sense of accomplishment, and sport devaluation. These burnout constructs can also be correlated with physical injury, feelings of amotivation, loss of focus, and feelings of incompetence which can create potential barriers prohibiting athletes from achieving their goals (Lin, Chen, & Hsu, 2021). Given the growing number of elite athletes reporting chronic stress and withdrawing from the sport at the peak of their athletic careers, a greater understanding is needed surrounding the factors that may protect individuals from maladaptive outcomes (Gustafsson et al., 2007). The

limited research on burnout in gymnasts focuses on factors of sport enjoyment and how it relates to burnout. Insight into how individual demographics, sport commitment, and injury affect burnout can inform athletes and coaches on how to design training loads for optimal performance and aid in creating and implementing training components to promote happiness and enjoyment.

METHODS

Participants

Participants consisted of 152 female (n =102) and male (n = 50) gymnasts across three gymnastics disciplines, including Women's Artistic Gymnastics (n=48), Men's Artistic Gymnastics (n=26), and Trampoline and Tumbling Gymnastics (n=78). The ages of participants across all disciplines ranged from 18-39 years old with the mean age being 20.5 years. The level of competition varied with 69 gymnasts currently competing collegiately, 70 at the elite level, six with representation at a previous Olympic Games, and seven identifying two or more levels of competition.

Design

This quantitative research study used an online survey design to administer the Athletic Burnout Questionnaire (Raedeke et al., 2009) and the Sport Commitment Scale (Scanlan et al., 1993a). Information regarding demographics was also collected including age, gender, discipline of gymnastics, current level of competition, and the number of hours trained both during competition season and in the off season. These demographics were represented as independent variables to examine the relation between level of competition and training intensities to the presence of burnout. Responses to questions involving injury history and sport commitment levels were also included as independent variables to evaluate trends of injury and sport commitment on burnout. Burnout included the three subscales of emotional and physical exhaustion, sport devaluation, and reduced sense of accomplishment which served as the dependent variables for this study.

Athlete Burnout Questionnaire

Burnout amongst gymnasts was first measured through distribution of the Athlete Burnout Questionnaire (ABQ). The ABQ is a reliable 15-item instrument aiming to evaluate three potential contributing categories of burnout including emotional & physical exhaustion, reduced sense of sport accomplishment, and sport devaluation (Gustafsson et. al., 2017). This questionnaire is reputable as it evaluates the common characteristics known to affect burnout. The results of this questionnaire provide researchers with a better understanding of the extent to which each of the subscales can influence the presence of burnout. When completing this instrument, participants responded using the 5-point Likert scale ranging from 1-meaning "Almost Never," to 5-representing "Almost Always". The scores were then computed according to the ABQ scoring guide to achieve a score for each subscale. According to the ABQ Manual, a score of ≥ 4.40 is considered clinically relevant to burnout (Raedeke & Smith, 2009). For this study, if any subscale scores were ≥ 4.40 , we defined that individual as experiencing burnout symptoms for that specific subscale. Once scoring for each subscale was complete, further analysis was evaluated between these subscale scores and the demographics participants responded to previously. The independent variables for the analysis of this instrument consisted of the participant's age, the discipline of competition, years of participation in gymnastics, and hours trained during competition season. Additional analysis was conducted for individuals deemed burned out to examine if injury history had an influence on symptoms of burnout. Results from these measures may provide enhanced awareness of how athletes' training intensities are correlated to injury levels in hopes of identifying more appropriate training protocols.

5 Point Likert Scale- As Defined by the Athlete Burnout Questionnaire

1	2	3	4	5
Almost Never	Rarely	Sometimes	Frequently	Almost Always

Sport Commitment Model Scale

Upon completion of the ABQ, participants then completed the Sport Commitment Model Scale, a 27-item evaluation based on six critical factors of sport commitment. These factors include sport commitment, sport enjoyment, involvement alternatives, personal investments, social constraints, and involvement opportunities (Scalan, Carpenter, Schmidt, Simmons, & Keeler, 1993). Similar to the ABQ, participants responded to the Sport Commitment Model through the 5-point Likert Scale, with 1 being a form of "not at all/ none/ or nothing" and 5 being in the form of "very much" or "a lot". The purpose of this instrument is to determine which factors potentially predict the presence of burnout in gymnasts at the highest level of competition. Upon completion and closing of the survey, data was organized into three separate samples based on the gymnastics discipline (Sample 1: Women's Artistic Gymnastics, Sample 2: Men's Artistic Gymnastics, Sample 3: Trampoline and Tumbling Gymnastics) to further understand comparisons between groups. The mean, standard deviation, and skewness for each sample were then calculated for each item. Recognizing factors and feelings that predict burnout may be beneficial to athletes, coaches, staff, and sporting organizations to recognize early symptoms of burnout and act accordingly to help eliminate the progression of burnout that could lead to further harmful consequences. In addition, this construct provides a basis as to why

gymnasts may participate in gymnastics and where their motivation stems from. Details regarding the root of their desired participation and motivation levels can provide crucial insight to coaches and staff to emphasize the importance of personalizing each athlete's training regimen and training intensity to match their desires and goals in sport. This is important to understand so coaches can challenge those athletes who are motivated to excel at the highest level of competition compared to challenging those individuals who desire participation in gymnastics for just the enjoyment and social aspect. The constructs of sport commitment may also potentially demonstrate the relation to burnout making it of primary concern to create awareness when athletes may be approaching burnout.

Reliability Analysis

Previously published psychometric data for both the Athlete Burnout Questionnaire (ABQ) and the Sport Commitment Model (SCM) demonstrate strong reliability. The use of the ABQ burnout measure has demonstrated scores of strong internal consistency reliability with alpha coefficients ranging from .84 to .91 in the initial scale development process (Radeke & Smith, 2009). As researchers have continued to distribute and analyze this questionnaire, alpha coefficients have ranged from .70 to .91, however most often exceed .80 (Black & Smith, 2007; Creswell & Eklund, 2004, 2005a, 2005b; Lemyre, Treasure, & Roberts, 2006; Lonsdale et al., Lonsdale, Hodge, & Jackson, 2007). Reliability analysis on the Sport Commitment Model Scale also resulted in a high level of consistency on the six constructs including sport commitment ($\alpha=0.89$), sport enjoyment ($\alpha=0.95$), involvement alternatives ($\alpha=0.60$), social constraints ($\alpha=0.88$), and involvement opportunities ($\alpha=0.80$) (Nunally, 1978; as cited by Scalan et. Al., 1993b). The personal investments scale was determined to have weak internal consistency

($\alpha=.50$). It should be recognized that the personal investments subscale presented less than acceptable values of reliability and conclusions regarding this scale should be carefully reviewed.

Procedures

Recruitment of participants began by contacting a Program Coordinator of USA Gymnastics to schedule a time to distribute survey materials via email to gymnasts who met inclusion criteria. Additional participants were recruited through a flier shared by the primary researcher via the social media platform, Instagram. All materials and procedures for this research study were approved by the Departmental Review Board (IRB #2022-74). Before participating in this study, participants were required to sign and complete a written informed consent which included the goal of the study, potential risks, and benefits. Participants were also informed that they may withdraw during the study at any time. Once consent was obtained, participants responded to a series of demographic questions regarding age, gender, discipline, hours of training, years of competition, as well as injury history. For this study, an injury was defined using the National Collegiate Athletic Association's (NCAA) definition of injury. The NCAA states an injury is any incident which occurred as a result of participation in an organized practice or competition that required medical attention by a team certified athletic trainer or physician and resulted in the restriction of the athlete's participation or performance for one or more calendar days beyond the injury date (Dick, 2007). The survey was administered via Qualtrics and participants were able to participate in any setting of their choice.

Inclusion criteria for the study required participants to be a male or female gymnast, 18 years of age or older, hold an Athlete Membership through USA Gymnastics or are competing

for a National Collegiate Athletic Association (NCAA) gymnastics program. Inclusion criteria also stated participants must be currently competing at the collegiate, elite, or Olympic level in one or more of the following disciplines: Trampoline and Tumbling Gymnastics, Women's Artistic Gymnastics, or Men's Artistic Gymnastics. Participants who failed to meet all inclusion criteria were excluded from the study and corresponding data was removed.

Statistical Analyses

Participants completed the survey for this research study via Qualtrics. Responses were then exported as an Excel spreadsheet and inserted into the Statistical Package for Social Sciences (SPSS) software where data and statistical analyses were performed. Means and standard deviations were calculated on demographic independent variables including age, gender, discipline of gymnastics, years of competition in gymnastics, and hours trained per week in season and out of season. To investigate the first research question of this study, bivariate correlation analyses were utilized to examine the relationship between demographic variables mentioned previously and burnout. Significance level was set at $p < 0.05$. The strength of Pearson correlations was dependent on the size of the correlation ranging from negligible correlation (.00-.30), low correlation (.30-.50), moderate correlation (.50-.70), high correlation (.70-.90), and very high correlation (.90-1.00) (Mukaka, 2012). The second research question of this study aimed to determine which components of sport commitment predict burnout. A linear regression analysis was performed to predict which constructs of sport commitment influenced emotional and physical exhaustion. Finally, the third research question evaluated if there is a relationship between current and previous injury history and burnout. Pearson product moment correlations were used to determine if having previous injuries, a current injury, or being removed from gymnastics due to injury influenced the three burnout subscales.

RESULTS

In this results section, demographics will first be presented by descriptive statistics across each gymnastics discipline. Bivariate correlations will also be presented for demographic variables, injury history, and burnout subscales of emotional and physical exhaustion, reduced sense of accomplishment, and sport devaluation. Pearson correlations results were used to understand the relationship amongst gender or discipline of gymnastics in correlation to burnout. Finally, linear regression results will be presented regarding potential predictors that may influence each subscale of burnout.

Demographic Variables

The sample was made up of 102 females and 50 males across the three gymnastics disciplines of Women's Artistic Gymnastics (n=48), Men's Artistic Gymnastics (n=26), and Trampoline and Tumbling Gymnastics (n=78). Participants comprised of elite (46%), collegiate (45.4%), and Olympic (4%) level gymnasts with some gymnasts competing at one or more of these levels (4.6%). Among the 152 participants, the average number of years these gymnasts have been competing was 13.1 years. Averages across the three gymnastics disciplines and gender varied slightly, however all expressed an average greater than 10 years of experience. The mean reported number of hours trained in season by participating gymnasts was 18.5 hours, while out of competition season was slightly less at 17.97 hours. A bivariate correlation was run to determine significance between hours of training in competition with emotional and physical burnout (<.001), sport devaluation (.008), and reduced sense of accomplishment where no significance was found. Analysis of hours of training out of season also indicated a significance

between emotional and physical burnout ($<.001$) and sport devaluation (.008), and again not showing a significance in relation to reduced sense of accomplishment.

Table 1.

Means and Standard Deviations of Demographic Variables Based on Discipline of Gymnastics

Variable	Discipline of Gymnastics	Women's Artistic Gymnastics (n = 48)	Men's Artistic Gymnastics (n = 26)	Trampoline & Tumbling Gymnastics (n = 54)	Trampoline & Tumbling Gymnastics (n = 24)
Gender	M/SD	Female	Male	Female	Male
Age	M	20.46	19.92	20.67	21.17
	SD	3.29	1.32	2.75	5.08
Years of Competition	M	14.27	12.96	12.81	11.67
	SD	2.46	3.22	3.73	4.96
Hours Trained In Season	M	21.52	22.23	16.19	13.67
	SD	4.84	4.47	6.62	4.83
Hours Trained Out of Season	M	19.92	22.92	15.24	14.83
	SD	7.18	5.81	6.84	5.09

Athlete Burnout

17.7% of gymnasts reported scores ≥ 4.40 on the emotional and physical burnout subscale of the Athlete Burnout Questionnaire. Women's Artistic Gymnastics participants made up 59% of this population, 37% were Trampoline and Tumbling gymnasts, and 4% were Men's Artistic Gymnastics participants. Seven participants scored ≥ 4.40 on the sport devaluation dimension of burnout subscale, all of which also experienced symptoms of burnout related to emotional and physical exhaustion. A Pearson correlation revealed a moderate positive correlation between emotional and physical exhaustion and sport devaluation ($r = .647$, $p = .001$). Slight gender differences were apparent when evaluating the relationship between emotional and physical exhaustion and sport devaluation. Females presented a slightly larger moderate correlation ($r = .635$, $p = .000$) than males ($r = .583$, $p = .000$). No participants scored ≥ 4.40 on the reduced sense of accomplishment subscale, however moderate correlations were also

found between reduced sense of accomplishment and sport devaluation ($r = .502, p = .001$). A moderate correlation ($r = .426, p = .001$) existed between emotional and physical exhaustion and reduced sense of accomplishment. Relationships were explored between emotional and physical exhaustion and sport devaluation amongst Women's Artistic Gymnastics ($r = .630, p = .000$), Trampoline & Tumbling Gymnastics ($r = .675, p = .000$), and Men's Artistic Gymnastics ($r = .496, p = .010$). Hours of training per week in competition season in relation to emotional and physical exhaustion had a negligible correlation ($r = .282, p = .004$), as did the number of hours trained out of season ($r = .237, p = .004$). Demographic variables of age, years of competition, and level of competition in relationship to the burnout dimensions were negligible.

Predictors of Sport Commitment on Burnout

A linear regression analysis was used to examine if constructs of sport commitment from the Sport Commitment Model predicted burnout. The regression equation indicated sport enjoyment, sport commitment, and personal investments of the gymnast were the most influential variables in distinguishing individuals with the potential of emotional and physical exhaustion. Sport enjoyment, sport commitment, and personal investments explained 34.5% of the variance in regard to emotional and physical exhaustion. The overall regression was statistically significant (R Square: .345, $F(3, 125) = 21.969, p = .000$).

Influence of Injury on Burnout

Of the respondents who participated in this survey, 96.6% revealed that they have experienced an injury at some point in their career. Gymnasts across all three disciplines averaged 7.23 injuries and 36.29 weeks of removal from sport due to injury during their years of participation in gymnastics. Further analysis was conducted to evaluate how injury may have

contributed to the presence of burnout. There was a significant negligible correlation between the amount of time off during their career as a result of injury and emotional and physical exhaustion ($r = .204, p = .013$). The mean number of injuries for those experiencing burnout was slightly higher than the rest of the participants at 7.93 injuries during their gymnastics career. In addition, the average time removed from gymnastics due to injury was 52.33 weeks. At the time of the survey, 31.6% of gymnasts indicated they were currently injured and represented 48.1% of the gymnasts experiencing burnout. A negligible relationship was found between gymnasts currently experiencing an injury and emotional and physical exhaustion ($r = .237, p = .004$).

DISCUSSION, CONCLUSIONS, & RECOMMENDATIONS

Burnout in sports is often conceptualized as a multidimensional cognitive-affective syndrome characterized by symptoms of emotional and physical exhaustion, reduced sense of accomplishment, and sport devaluation (Eklund & DeFreese, 2015; Fender, 1989; Raedeke, 1997; Raedeke & Smith, 2001). Athletes may be susceptible to burnout due to physical and emotional ramifications of their sport, lack of sport enjoyment, and injury. Gymnasts competing at the collegiate, elite, or Olympic level may be particularly susceptible to burnout due to the culture of the sport, increased training durations and intensities, and the desire to reach unrealistic expectations of perfection. It has also been seen athletes with reduced perceived control and reduced autonomy may feel entrapped within their sporting environment thus remaining involved despite low levels of enjoyment (Dubuc, 2010).

Due to an apparent increase in elite athlete burnout within the last three decades, further research is essential to validate training and competition regimens developed by coaches, managers, and sporting organizations to maintain an athlete's enjoyment and longevity in sport (Gustaffson, DeFreese, & Madigan, 2017). The present study aimed to identify relationships between an athlete's training demographics and emotional and physical exhaustion, sport devaluation, and reduced sense of accomplishment. In addition, a second research question was designed to understand the relationship between a gymnast's injury history and current injury status on the three dimensions of burnout. A third question explored potential contributors of burnout amongst sport commitment, sport enjoyment, involvement alternatives, personal investments, social constraints, and involvement opportunities. The independent variables for this study included demographics, injury, and sport commitment as measured by the Sport Commitment Model. The dependent variable included the three dimensions of burnout

represented by emotional and physical exhaustion, sport devaluation, and reduced sense of accomplishment as measured by the Athlete Burnout Questionnaire.

Demographics and Burnout

Gymnasts may be prone to burnout due to the demands and nature of the sport that often requires heavy and long training durations in addition to early sport specialization, typically resulting in numerous years of competition. In the present study, the first research question aimed to evaluate if demographic variables such as age, gender, discipline of gymnastics, and increased training durations per week would result in a greater risk of burnout amongst gymnasts. As athletes experience physical changes, cognitive development, and modified social expectations, adolescent athletes often enter a more challenging state of athletic development associated with increased specialization and become vulnerable to feelings of burnout (Morano et al., 2022). Researchers have found as athletes age, they become more susceptible to burnout; however, the data presented in this study rejected that hypothesis, as no relationship between age and burnout was found. Previous literature has addressed gender differences in regard to burnout, with females typically experiencing greater prevalence and levels of burnout than males. For example, a study done with female and male NCAA Division 1 athletes revealed female athletes were more likely to experience emotional and physical exhaustion compared to male athletes competing at the same level (Giusti, 2022). In addition, another researcher found female athletes experience significantly higher rates of reduced sense of accomplishment than male athletes (Isoard-Gauthier, 2015). These findings were supported in the present study as female gymnasts had slightly higher correlation values to emotional and physical exhaustion than male participants.

The present study revealed the hours trained in and out of season had a significant, but low correlation with symptoms of burnout. Therefore, the hours athletes participate in weekly training should be further researched to better understand the most appropriate training regimens for athletes to be successful and avoid burnout. Sport specialization often requires stressors of long training hours, social isolation, increased anxiety, decreased family time, and burnout (Brenner et al., 2019). It was hypothesized the longer the gymnast had been participating in gymnastics, the greater risk of experiencing symptoms of burnout, however, there was not a significant correlation in the present study. Athlete burnout is associated with great distress, health problems, reduced sports performance, and termination of an individual's athletic career. Recognition of burnout symptoms may allow early intervention and adjustment of training regimens and durations to help protect an athlete's well-being and longevity in sport.

Sport Commitment and Burnout

Researchers often recognize burnout as a chronic condition which typically occurs when an individual works too hard for too long in high-pressure scenarios (Figley, 2002). Competing at the collegiate, elite, or Olympic level demands a high commitment to training, mental toughness, personal investments, and sacrifice. Sport commitment is defined as the psychological state to persist in the sport over time (Scanlan, 2016). Research has shown there is not one symptom to diagnose burnout, but instead a spectrum of components can dictate and influence onset and severity of burnout (Maslach, 2016). Constructs of sport enjoyment, sport commitment, social constraints, personal investments, involvement opportunities, and involvement alternatives were examined to determine their relation to burnout. Among these constructs, the literature often suggests sport enjoyment is the greatest predictor of sport commitment (Scanlan et al., 1993a). The present study supported this hypothesis as level of sport

enjoyment served as the most significant predictor of burnout amongst gymnasts. In addition, overall commitment levels and personal investments explained the variance regarding burnout for this population. Variables such as time commitment, effort, and financial demands represent the personal investments construct. At this level of competition, athletes may have scholarships or funding from their sporting organizations; however, the time, effort, and expenses dedicated up until this point could influence commitment levels and desire to participate in sports.

Encouraging athletes to accomplish their goals at the pinnacle level of their sport should not come at the cost of their enjoyment of participating in their sport, or burnout may arise. Further insight into how the variables of sport commitment can affect burnout may inform athletes and coaches how to design training loads for optimal performance and aid in creating and implementing training components to promote happiness and enjoyment with the goal of preventing symptoms of burnout.

Injury and Burnout

Whether participating at the recreational or elite caliber levels of sport, injury is a natural occurrence. Although there has been minimal research conducted on the relationship between injury and burnout, a few studies have found evidence supporting a relationship between injury history and burnout. For example, a study with NCAA Division 1 athletes found those with a history of injury, whether prolonged or overuse, experienced higher levels of reduced sense of accomplishment than those who have not experienced injury (Giusti, 2022). In the present study, no participants reached the threshold of experiencing burnout in the reduced sense of accomplishment dimension. However, it is important to note participants in the present study were experiencing sport devaluation which may be associated with a reduced sense of accomplishment (Raedeke, 2009). Oftentimes, injuries at this high level of sport are associated

with feelings of frustration and depression due to the sudden lack of sport involvement (Clement, 2015). This often results in lack of motivation and eagerness to return to sport. With nearly half of the currently injured participants in the study experiencing emotional and physical exhaustion and/or sport devaluation, it is essential for coaches, parents, medical staff, and sporting organizations to support their athletes and create individualized rehabilitation programs to aid in retaining athlete enjoyment and desire to participate in sport. The relationship between time removed from sport due to injury throughout a participant's career and burnout was explored, however there was a negligible correlation. In a meta-analysis analyzing return to sport after injury and fear of reinjury, 63% of participants returned to sport (Hsu et al., 2017). However, the fear of reinjury was the most frequently cited reason resulting in reduction of sports participation. Athletes who are injured are challenged physically to return back to a healthy state, however, they also experience psychosocial repercussions that can influence their desire to return to sport. Education on symptoms of burnout allows for coaches, parents, and medical staff to intervene and ensure an athlete's safety and well-being are the utmost priority.

Conclusions

Previous research has concluded there is not one definition nor one defining symptom of burnout, but rather a spectrum of contributors which can influence athlete well-being and performance. The current study demonstrated demographic variables such as age, gender, the discipline of gymnastics, years of competition, and the number of hours trained in and out of season may be associated with dimensions of burnout in collegiate, elite, and Olympic level gymnasts. Participants at the collegiate, elite, and Olympic level who are female, have a greater number of training hours per week, are currently injured, or have been removed from sport for long durations due to injury are more likely to experience symptoms of burnout than other

athletes. A linear regression analysis in the current study provided insight on how sport enjoyment, sport commitment, and an individual's personal investments can all influence burnout. Therefore, examination of demographics, sport commitment, and injury can aid in education, intervention, and implementation that may contribute to the reduction of burnout prevalence in collegiate, elite, and Olympic level gymnasts.

Limitations

There are various approaches to what determines a gymnast being in-season versus out-of-season; however, for this study, a gymnastics season begins at the point of an individual's first competition and ends when they have competed in their last competition of the calendar year. A limitation of the study was that data collection occurred at different periods of the gymnastics season depending on the discipline and level of competition. For example, NCAA collegiate gymnastics for females and males begins in January and concludes with the National Championship in April. Some collegiate programs may experience an earlier season end date if they do not qualify to participate in the National Championship. On the other hand, the elite and Olympic level competition generally starts in February and ends in late November or early December. One important aspect to recognize for the sport of gymnastics is that it is common to be competing at the collegiate, elite, and Olympic levels simultaneously. In other words, a participant competing solely in collegiate gymnastics responded to this survey towards the end of their competition season in April. Conversely, an elite gymnast may have been at the end of their collegiate season, but at the midpoint of their elite or Olympic season.

Another limitation of the present study was the lack of junior elite gymnast participation as they were minors and required additional consent. This study was targeted towards individuals

ages 18 and older, however, distributing this survey to this younger elite population would be beneficial in understanding the prevalence of burnout differences between junior elite athletes and those collegiate, senior elite, and Olympic athletes. This would provide further insight into the trajectory of youth and junior elite athlete burnout and the potential effects on the longevity of their time in the sport.

Recommendations for Further Research

Previous research has investigated why athletes experience performance decrements, changes in motivation, decreased enjoyment, and reasons for withdrawing or retiring from sport prematurely. The current study provided insight related to sport commitment, injury, and burnout amongst gymnasts with various demographics. Understanding what stressors or constructs influence burnout can allow an athlete's support system to intervene before or at early onset to avoid prolonged burnout symptoms and protect the well-being of the athlete. To better understand when the onset of burnout symptoms may arise in gymnasts, a pre/ mid/ posttest design may be useful to evaluate how burnout symptoms progress and at what time in the season they are most prominent. Knowing when gymnasts are more vulnerable to burnout can allow coaches to adjust training demands proactively to promote athlete success and enjoyment of their sport.

The present study revealed a negligible correlation between those currently injured and emotional and physical burnout. This study did not collect information related to the participants specific injury and time they were removed from sport. A participant could have been experiencing a minor ankle sprain and be out for a week, while another gymnast could be recovering from an ACL reconstruction which could take six months up to a year to recover and

return to activity. Both require different demands of recovery, time spent away from gymnastics, and different psychosocial factors which could be influencing the individual. Future research should investigate how various injuries and their respective recovery timelines influence the prevalence of burnout. Understanding this spectrum could help athletic trainers, physical therapists, physicians, and coaches to engage athletes in activities related to sport within their recovery protocol to help the gymnast remain invested in their sport, included with their team, and improve the desire to return back to the field of play.

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APPENDIX A:

DEMOGRAPHICS

What is your gender?

- ◇ Female
- ◇ Male

What is your current age in year?

What discipline do you currently compete in?

- ◇ Women's Artistic Gymnastics
- ◇ Men's Artistic Gymnastics
- ◇ Trampoline & Tumbling Gymnastics

How many years have you been competing in gymnastics?

On average, how many hours do you train in a typical week during competition season?

On average, how many hours do you train in a typical week when out of competition season?

What is your current level of competition? (select all that apply)

- ◇ Collegiate
- ◇ Elite
- ◇ Olympic

What is your ultimate goal in gymnastics?

The following questions pertain to injury. We are defining injury based on the following criteria (all three must be true).

1. Occurred as a result of participation in an organized practice or competition
2. Required medical attention by a certified athletic trainer or physician
3. Resulted in restriction of the athlete's participation or performance for one or more calendar days beyond the day of injury

Based on the above criteria, have you ever been injured during your time competing in gymnastics?

- ◇ Yes
- ◇ No

Based on the above criteria, how many times have you experienced an injury in gymnastics?

Considering all injuries, how much time (in weeks) have you been out of practice and competition?

Are you currently injured?

- ◇ Yes
- ◇ No

APPENDIX B:

INFORMED CONSENT TO PARTICIPATE IN RESEARCH

Principal Investigator: Stephanie Jevas [Co-investigators:] Alyssa Oh

Overview: You are invited to participate in a research study that collects and correlates each athlete's (participants) injury history, sport enjoyment and commitment to burnout. Participants must currently be 18 years of age or older and competing in a National Collegiate Athletic Association affiliated gymnastics program or hold an Athlete Membership through USA Gymnastics. Participants must be competing at the collegiate, elite, or Olympic level in one of the following disciplines: Women's Artistic Gymnastics, Men's Artistic Gymnastics, or Trampoline and Tumbling Gymnastics.

Study Details: This study is being conducted via Qualtrics. The purpose of this study is to evaluate and correlate athlete burnout and level of enjoyment with performance outcomes, thus enabling coaches and training staff a more appropriate reference to help their athletes' practice and compete to the best of their ability. Participation in this study will take 10-15 minutes depending on response time.

Participants: You are being asked to take part in this study because you are a collegiate, elite, or Olympic level gymnast who might have experienced injury in sport, burnout, or different levels of sport enjoyment throughout your career. We want to see how these factors influence your extent of burnout. If you decide to be in this study, you will be one of 100 participants in this research study.

Voluntary Participation: Your participation is voluntary. You do not have to participate and may stop your participation at any time.

Confidentiality: Even if we publish the findings from this study, we will keep your information private and confidential. Anyone with authority to look at your records must keep them confidential.

What is the purpose of the research?

The purpose of this study is to examine the relation between burnout, sport enjoyment, and injury history in collegiate, elite, and Olympic level male and female gymnasts. The expected outcomes of this research include identifying direct and indirect relationships between athlete demographics, injury history, sport enjoyment, and athlete burnout. Recognizing the characteristics of burnout may assist athletes and coaches in identifying interventions to improve sport enjoyment and allow athletes to compete at the level they desire. This may include altering practice structures and training loads to avoid overtraining and burnout.

What is my involvement for participating in this study?

We expect your participation to take about 10-15 minutes for the entirety of this study.

Are there any alternatives and can I withdraw?

There is no alternate procedure. You do not have to participate in this research study. You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. To withdraw from the study, please contact and notify Alyssa Oh via email at alyssa.oh@tcu.edu.

What are the risks for participating in this study and how will they be minimized?

Some participants may experience discomfort answering some of the questions, but they are free not to answer any questions they wish not to answer.

What are the benefits of participating in this study?

Currently, no studies exist that examine burnout and sport enjoyment and the role of these constructs in contributing to injury levels in collegiate, elite and Olympic level gymnasts. Understanding the effects of burnout on collegiate, elite, and Olympic level athletes is necessary to develop interventions, training programs and rehabilitation techniques to improve physical well-being and overall longevity and success in sport. This awareness and recognition of burnout and when it begins to arise aids athletes and coaches in preventative action in pursuing a healthy athletic career enabling gymnasts to “go for gold.”

Will I be compensated for participating in this study?

Participants will not receive individual compensation for this study, however participants completing the study and instruments to their entirety will be entered to win a \$25 Amazon gift card. After the completion of the survey, participants will be prompted and redirected to enter their name and email if they choose to be eligible for this compensation. This Amazon Gift Card Entry Form is a separate form in Qualtrics and will not be directly linked to the submission answers of the survey provided in preceding pages. A \$25 Amazon e-gift card will be distributed for every 25th participant via email provided on this Amazon Gift Card Entry Form. Four participants will receive gift cards.

What are my costs to participate in the study?

There are no costs to participate in the study.

How will my confidentiality be protected?

Every effort will be made to limit the use and disclosure of your personal information, including research study records, to people who have a need to review this information. We cannot promise complete secrecy. Your records may be reviewed by authorized University personnel or other individuals who will be bound by the same provisions of confidentiality. Your information or samples collected as part of the research, even if identifiers are removed, will NOT be used or distributed for future research studies. We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.

What will happen to the information collected about me after the study is over?

All signed consent forms and hard data will be stored a minimum of three years in the Principal Investigators office at Texas Christian University in a locked file cabinet.

Who should I contact if I have questions regarding the study or concerns regarding my rights as a study participant?

You can contact Alyssa Oh alyssa.oh@tcu.edu or Stephanie Jervas at s.jervas@tcu.edu with any questions that you have about the study.

Dr. Dru Riddle, Chair, TCU Institutional Review Board, (817) 257-6811, d.riddle@tcu.edu; or

Dr. Floyd Wormley, Associate Provost of Research, research@tcu.edu

By selecting "I consent, begin the study", you are agreeing to be in this study. Make sure you understand what the study is about before you agree. If you wish to not participate, please select "I do not consent, I do not wish to participate". You will be given a copy of this document for your records upon request. If you have any questions about the study after you agree to participate, you can contact the study team using the information provided above.

- ◇ I consent, begin the study.
- ◇ I do not consent, I do not wish to participate.

APPENDIX C

FLIER TO PARTICIPATE IN ONLINE SURVEY



VOLUNTEERS NEEDED FOR RESEARCH STUDY

Effects of Sport Enjoyment and Injury Related to Burnout in
Collegiate, Elite and Olympic Level Male and Female Gymnasts

IRB# 2022-74

- I am conducting research to find out how levels of sport enjoyment and injury contribute and relate to burnout in collegiate, elite, and Olympic gymnasts in Women's Artistic Gymnastics, Men's Artistic Gymnastics, and Trampoline & Tumbling Gymnastics.
- In order to participate, you must currently be 18 years or older and hold an Athlete Membership through USA Gymnastics or be on the roster of an NCAA collegiate gymnastics program. Participants must be competing in the discipline of Women's | Artistic Gymnastics, Men's Artistic Gymnastics, or Trampoline & Tumbling Gymnastics.
- You will be asked to complete a series of questions through an online platform that will take 10-15 minutes.
- Research will take place online through Qualtrics software in a setting of the participants choosing. Some participants may experience discomfort answering some of the questions, but they are free not to answer any questions they wish not to answer.
- After full completion of the survey, you will have the option to enter for a chance to win a \$25 Amazon gift card. Recipients of the gift card will be the 25th, 50th, 75th, and 100th individual to complete the survey.

Click here: [The Effect of Sport Enjoyment and Injury Related to Burnout Survey](#) (put link here) or contact Alyssa Oh (alyssa.oh@tcu.edu) to participate in this study.

