Coach-Gymnast Relationships, Psychological Well-Being, and Self-Reported Performance Among Competitive Gymnasts: A Cross-Sectional Study

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ABSTRACT

The coach-athlete dyad is the central interpersonal component of an athlete's psychosocial training. The purpose of the study was to find out the relationship between perceived quality of the coach-gymnast relationship, psychological well-being, and self-reported performance markers in competitive gymnasts. Descriptive analytical cross-sectional design was adopted with a purposive sample of 25 competitive gymnasts (Male = 15 and Female = 10) between 19-25 years of age in Rohtak, Haryana, India. A 20-item survey with five-point Likert scale was given to the participants, including 10 items that measured coach-athlete relationship quality based on the 3+1 Cs framework and 10 items that measured mental preparedness, pre-performance stress, emotional stability, fatigue recovery, evaluation anxiety, motivation, sleep quality, self-confidence, perceived performance improvement, and coach psychological support. Descriptive statistics, independent samples t-test, Pearson's correlation coefficient was used to analyse the data. Relationship quality perceptions were largely favorable, with the highest rating being that the relationship aids in better performance (4.40 ± 0.56). The coach-athlete relationship scores showed a strong ($r = .714$, $p < .001$) statistically significant positive correlation with composite psychological well-being/performance score. Male gymnasts reported significantly higher composite scores (4.01 ± 0.45) than female gymnasts (3.62 ± 0.50; $t[23] = 2.18$, $p = .039$). The results support the strong relationship between interpersonal dyadic positivity and increased psychological preparedness and self-perceived athletic development. Because this was a cross-sectional design, based on subjective self-report, with a small sample size, causal explanations are not justified.

Keywords: *coach-athlete relationship; gymnastics; well-being; athlete; gender differences.*

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INTRODUCTION

An elite level of skill, repetitive physical training, continuous assessment, and swift injury care are necessary to succeed in artistic and competitive gymnastics. In this time-limited, intense psychosocial and physical environment, coaches have a powerful impact not only on the technical and biomechanical aspects of the gymnastics but throughout the social and emotional landscape of the gymnasts. Coaches' thoughts, feelings and behaviours are interdependent and operate in a dynamic partnership with athletes' thoughts, feelings and behaviours (Jowett & Cockerill, 2003; Jowett & Ntoumanis, 2004; Jowett, 2017). The qualitative and empirical findings suggest that effective and positive athletic relationships develop in the context of trust, communication, common athletic goals and different behavioral roles (Jowett & Meek, 2000; Philippe & Seiler, 2006).

According to the 3+1 Cs conceptual framework (Jowett & Ntoumanis, 2004; Jowett & Shanmugam, 2016), the quality of a dyadic relationship is made up of four dimensions: affective bonds (closeness), cognitive intentions (commitment), cooperative, reciprocal task behaviours (complementarity), and shared understanding

and perspectives (co-orientation). This relational structure is operationalized via psychometric tools like the Coach-Athlete Relationship Questionnaire (CART-Q) and has been shown to have good predictive power in different competitive sports and in cross-cultural settings (Jowett & Ntoumanis, 2004; Yang et al., 2015). Relationship maintenance strategies are emphasized in complementary models such as positive affective interaction, openness, assurance, task-oriented motivation, support systems and proactive conflict management (Rhind & Jowett, 2010, 2012).

The coach's interpersonal approach is crucial to the athlete's functioning, as it either supports or undermines the athletes' basic psychological needs of autonomy, competence, and relatedness, which are grounded in self-determination theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2017). Autonomy-supportive coaching environments enable autonomous self-regulation, intrinsic motivation, and positive emotional affect, while controlling, coercive, and neglectful coaching environments lead to need frustration, burnout, and psychological distress (Adie et al., 2008, Appleton et al., 2016, Mageau & Vallerand, 2003, Reinboth & Duda, 2006). Recent research has shown that the relational quality unfolds in complex psychological ways and affects the subjective and objective sport performance of athletes. For instance, Pan and Sui (2025) found that the quality of the relationship between the coach and athlete directly and indirectly affected the athlete's performance levels, mediated by emotional intelligence and athletic engagement. In individual sports such as gymnastics, it is much more dyadic, and the athlete's psychological setting is much more about the direct relationship between athlete and coach. Individual sports have much more dyadic interdependence, meaning that the athlete's psychological ecosystem is much more focused on the relationship between the athlete and the coach.

Relational mechanisms have a close relationship to athlete's welfare and mental health. Whether it be the pressure to make it to a select team, the scrutiny of the public or the foreclosure of athletic identity, chronic fatigue, competitive athletes suffer from mental health stressors everywhere (Gouttebarge et al., 2019; Reardon et al., 2019; Rice et al., 2016). Modern approaches to sports psychiatry and athlete well-being focus on fostering a psychologically safe sporting environment, early identification of distress and ready referral systems (Henriksen et al., 2020; Purcell et al., 2019). However, cultural stigma and low levels of mental health knowledge, as well as worries about deselection or derogation, are significant barriers to help-seeking (Cosh et al., 2024; Gulliver et al., 2012). This is especially the case for gymnastics where training is often intense and begins early in development, giving coaches an evaluative powerhouse. Positive environments create competence and resilience, and unchecked power differences can create the wrong norms, for example by training through severe injury, excessive body surveillance, or emotional intimidation (Bennie et al., 2015; Mountjoy et al., 2016; Stirling & Kerr, 2008). Such environments can lead to athletic burnout – defined as feelings of emotional exhaustion, depersonalization and diminished athletic performance (Gustafsson et al., 2011; Raedeke & Smith, 2001) often compounded by perfectionism and poor recovery (Hill et al., 2009; Isoard-Gautheur et al., 2012; Madigan et al., 2015).

MATERIALS AND METHODS

Study Design

A cross-sectional survey design was used. The study conducted at two university gymnastics training centers at Rohtak, Haryana, India.

Participants

The participants were active competitive gymnasts, age range 19-25 years, with systematic training schedules, and continuous working with primary coach for at least one year. A purposive sampling of 25 gymnasts (15 men (60%) and 10 women (40%)) was obtained. Due to the specific nature of the elite group and the one-city nature of this sample, the sample was considered exploratory. All athletes gave informed consent before data collection and the procedures.

Measurement and Instrumentation

A structured self-administered questionnaire with 20 statements was used to collect data, where 1 = strongly disagree and 5 = strongly agree. The questionnaire contained two 10 item dimensions:

1. Coach-Athlete Relationship Quality (10 items): Adapted from the conceptual dimensions of the 3+1 Cs model (closeness, commitment, complementarity and co-orientation; Jowett & Ntoumanis, 2004; Jowett & Shanmugam, 2016). Facilitated items included trust, perceived respect, emotional closeness, mutual commitment to goals, constructive feedback and value of athlete input.
2. Psychological Well-Being and Perceived Performance (10 items): This scale aimed to determine important aspects of subjective athlete functioning such as mental preparation, stress before competition, emotional stability when performing, recovery after competition, anxiety in evaluation, constant motivation, sleep quality, self-confidence in competition, improvement in athlete perception and psychological support of the coach.

The expert panel of sports scientists and gymnastics coaches assessed and confirmed the content and face validity. Five competitive gymnasts (not included in the final analytical sample) were used for a preliminary pilot administration to confirm clarity and readability. Items that were negatively worded (pre-performance stress and coach evaluation anxiety) were reverse-scored before the composite scores were calculated so that higher numerical composite scores represented more positive psychological well-being and adaptive performance experiences.

The relationship-quality items included in this study were study-specific and not the validated Coach-Athlete Relationship Questionnaire (CART-Q), although conceptually similar to that of the 3+1 Cs model (Jowett & Ntoumanis, 2004; Jowett & Shanmugam, 2016). Findings, therefore, should be interpreted as the constructs measured in this study using its instrument and not as CART-Q scores. The full 20-item questionnaire is available as Supplementary Material, to aid transparency and replication.

Statistical Analysis

IBM SPSS Statistics (Version 26.0) was used for all analyses. The mean (M) and standard deviation (SD) of each item, subscale and age group were calculated. Pearson's product-moment correlation was used to analyze the relationships between perceived coach-athlete relationship quality and composite psychological well-being scores, and Fisher's z-transformation was used to calculate 95% confidence intervals. Independent-samples t-test was used to compare the composite scores in males and females, and standard error was used to calculate confidence intervals. Significance was defined as $p < .05$ (two-tailed) and results were reported to three decimal places (APA style), values $< .001$ were reported as $p < .001$.

RESULT

Participant Demographics

The analytical sample comprised 25 competitive gymnasts (15 male, 10 female) distributed across three age categories: 19 years (n = 9, 36%), 20–22 years (n = 9, 36%), and 23–25 years (n = 7, 28%). Demographic

distribution is summarized in Table 1.

Table 1: *Distribution of Participants by Age Category and Gender (N = 25)*

Age Group (years)	Male (*n*)	Female (*n*)	Total (*n*)	Percentage (%)
19	6	3	9	36.0%
20–22	5	4	9	36.0%
23–25	4	3	7	28.0%
Total	**15**	**10**	**25**	**100.0%**

Coach-Athlete Relationship Ratings

Favorable mean scores were found for every dimension of the coach-athlete relationship domain, with all means above the 3.00 (neutral) score of the scale (Table 2). Gymnasts indicated the most agreement with the item "Relationship helps to improve your performance" (M = 4.40, SD = 0.56) followed by "Feels good because the coach treats you with respect" (M = 4.36, SD = 0.59), and "You feel you can trust the coach when you're competing" (M = 4.32, SD = 0.61). The least rated item was comfort in talking about personal things with the coach (M = 3.64, SD = 1.02) and this item also had the largest range of ratings from participants.

Table 2: *Item-Level Descriptive Statistics for Coach-Athlete Relationship Quality*

Item Statement	Mean (*M*)	Standard Deviation (*SD*)
Feels emotionally close to the coach	4.20	0.77
Coach listens to and understands needs	4.12	0.69
Coach and gymnast share commitment to training goals	4.28	0.63
Feels respected by the coach	4.36	0.59
Coach provides consistent motivation	4.00	0.82
Feels comfortable discussing personal matters	3.64	1.02
Coach provides constructive feedback	4.24	0.70
Coach values the gymnast's input	3.88	0.88
Relationship contributes to better performance	4.40	0.56
Trusts the coach in competitive situations	4.32	0.61

Psychological Well-Being and Perceived Performance

Gymnasts endorsed the greatest mean for perceived enhancement in recent performances (M = 4.24, SD = 0.64), followed by staying motivated over the course of the training season (M = 4.16, SD = 0.74) and believing that the coach's support decreases the psychological pressure (M = 4.12, SD = 0.68) within the psychological well-being and performance domain in Table 3. The mean score for the pre-performance stress items (unadjusted for negative wording) was 3.60 ± 0.88, while that for the evaluation anxiety items (unadjusted for negative wording) was 3.44 ± 0.93.

Table 3: *Descriptive Statistics for Psychological Well-Being and Perceived Performance Indicators*

Item Statement	Mean (*M*)	Standard Deviation (*SD*)
Feels mentally prepared for training	4.08	0.76
Experiences stress before performance*	3.60	0.88
Maintains emotional stability during difficult routines	3.84	0.81
Recovers well from training-related fatigue	4.00	0.67
Feels anxious during coach evaluations*	3.44	0.93

Maintains motivation throughout the training cycle	4.16	0.74
Has healthy, uninterrupted sleep	3.88	0.79
Maintains confidence before competitions	3.92	0.70
Perceives improvement in recent performance	4.24	0.64
Believes coach support reduces psychological pressure	4.12	0.68

** Means raw (unreversed) item means. In composite scale calculations, these were reverse coded with higher scores indicating less stress/anxiety.*

Correlation Between Relational Quality and Well-Being

A bivariate association was found between perceived coach-athlete relationship quality score and the combined psychological well-being/performance score, which was strong, positive, and statistically significant ($r = .714$, $p < .001$; Table 4). The gymnasts with higher scores on relational trust, respect and communication were also significantly more psychologically prepared, felt lower pressure to evaluate and performed better.

Even with this small sample size, the 95% confidence interval for this correlation (Fisher's z-transformation) was [.44, .87], meaning the correlation was precise and definitely positive.

Table 4: *Bivariate Pearson Correlation Between Key Variables*

Variable Relationship	**Pearson's *r***	***p*-value**
Coach-athlete relationship score & Combined well-being/performance score	.714	< .001

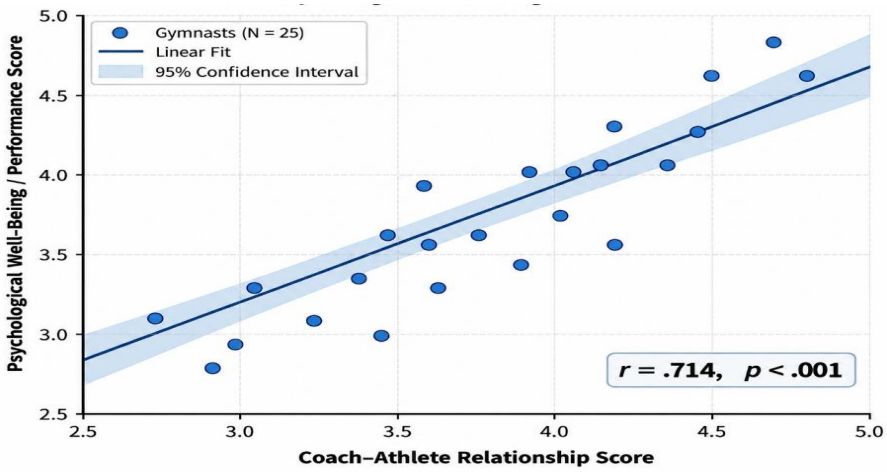

Figure 1: *Scatter plot illustrating the linear association between perceived coach-athletes.*

The linear regression trend is shown as the solid blue line ($r = .714$ $p < .001$) and the shaded ribbon represents the 95% confidence interval.

Gender Differences

An independent-samples t-test was used to compare the composite psychological well-being/performance scores of the male (n = 15) and female (n = 10) gymnasts. Male gymnasts exhibited a statistically significantly higher composite score (M = 4.01, SD = 0.45) compared to female gymnasts (M = 3.62, SD = 0.50; $t[23] = 2.18$, $p = .039$, Cohen's $d = 0.82$; Table 5).

A 95% confidence interval for the difference $\mu A - \mu B$ of the two-population means is (0.02, 0.76). This gender difference is a tentative and exploratory one that, given the low lower bound of this interval and modest sizes of the subgroups (n = 15 vs. n = 10),

should be replicated with a larger, more balance sample of participants.

Table 5: *Independent-Samples t-Test Comparing Composite Scores Across Genders*

Outcome Variable	Gender	*n*	Mean	*SD*	*t*-value	*df*	*p*-value	Cohen's *d*
Combined Well-Being & Performance	Male	15	4.01	0.45	2.18	23	.039	0.82
Combined Well-Being & Performance	Female	10	3.62	0.50				2.18, 23.039, 0.82

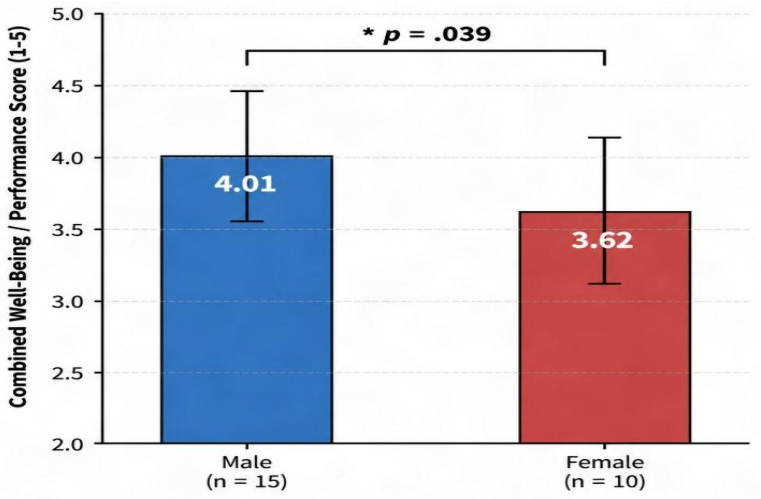

Figure 2: *Comparison of composite psychological well-being and perceived performance scores between male (n = 15) and female (n = 10) competitive gymnasts.*

Bars in the figure indicate group means (4.01 vs. 3.62), and error bars indicate standard deviations (± SD). The asterisk (*) denotes statistical significance at $p < .05$ ($t[23] = 2.18$, $p = .039$, Cohen's $d = 0.82$).

DISCUSSION

The study investigate the correlation between coach-athlete dyadic quality, psychological well-being and perceived performance of competitive gymnasts of Haryana, India. The overall results showed a significant strong positive correlation with the composite well-being/performance score and the quality of the coach-athlete relationship ($r = .714$, $p < .001$). Gymnasts who felt their relationship with their coach was supportive, trusting, and respectful reported higher levels of mental preparedness, sustained motivation, better recovery, and higher confidence in their progress from the previous performance. These findings concur with interpersonal dyadic models that indicate that the psychological scaffolding of athletes functioning in high-level training is derived from a sense of mutual trust, shared commitment, and complementary communication (Jowett & Ntoumanis, 2004; Jowett, 2017; Rhind & Jowett, 2012). Moreover, the results of this empirical study supplement recent findings by Pan and Sui (2025) that high coach-athlete relationship quality positively predicted athletic performance through increased emotional intelligence and engagement.

These dynamics can be explained by the theoretical accounts based on self-determination theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2017). For athletes in competitive sports such as gymnastics,

coaches who encourage independence, accept feedback, and give feedback on technique, but not punishment for error, meet the basic psychological needs for competence and relatedness. This relational security reduces the psychophysiological strain and allows gymnasts to be emotionally stable when faced with pressure to perform during evaluation (Davis & Jowett, 2014; Davis et al., 2018; Mageau & Vallerand, 2003; Reinboth & Duda, 2006).

A key nuance from the item level analysis arose. Athletes reported a high level of trust in their coach ($M = 4.32 \pm 0.61$) and the technical and performance aspects they received from their coach ($M = 4.40 \pm 0.56$), but there was a noticeable lower rating for feeling comfortable discussing personal matters with their coach ($M = 3.64 \pm 1.02$). The separation reveals that technical rapport doesn't automatically equal large emotional laying uncovered. In elite gymnastics, athletes can be fully aware of interpersonal vulnerabilities, mood disturbances, fatigue or minor injuries and can choose to hide these symptoms for fear of being negatively evaluated, losing their competitive status or being deselected. Coaches alone, therefore, should not be expected to notice and intervene in cases of covert distress, meaning that it is essential that there are readily available, confidential avenues for mental health and welfare support within sports academies and universities (Henriksen et al., 2020; Purcell et al., 2019; Reardon et al., 2019).

The exploratory comparison showed that male gymnasts' scores on the composite well-being and perceived performance scale were significantly higher than female gymnasts' scores ($t[23] = 2.18$, $p = .039$, $d = 0.82$). This finding is interesting, but should be viewed with a great deal of caution because of the small sample sizes of each of the subgroups (15 men versus 10 women). In the existing literature on gymnastics there is a strong sociomedical and sociocultural pressure on the body appearance, weight control and perfectionism of female gymnasts (Kerr & Dacyshyn, 2000; Krane et al., 2001; Sundgot-Borgen & Torstveit, 2004). Coach/athlete dyad gender factors such as coach gender, communication style, and authoritarianism may also be factors to consider in the subjective comfort and evaluation anxiety of female gymnasts. Further studies with more balanced samples and higher volumes of training per week, as well as competitive level and injury history, will be necessary to make any definitive conclusions about gender differences.

In terms of applied athlete safeguarding, the researchers' results highlight that high-performance standards should be balanced with the importance of a respectful, athlete-focused approach to coaching. Intimidation, emotional abuse and pressure to perform despite injury are completely counterproductive to sustainable athletic development and psychophysiological well-being (Bennie et al., 2015; Mountjoy et al., 2016; Parent & Fortier, 2018; Stirling & Kerr, 2008). Coaching education programmes for interpersonal communication with a formal approach should be established in institutional bodies and independent sports psychology and safeguarding personnel should be available at regional training centres in India.

CONCLUSION

For competitive gymnasts from Rohtak, Haryana, there was a strong positive relationship between perceived coach-athlete relationship quality and psychological well-being and self-reported performance. Athletes were very appreciative of their coaches' role in helping them perform well and were very competitive with their coaches, however, their reluctance to talk about personal issues points to the importance of independent athlete welfare. Creating a coaching environment that is

communicative, athlete centred, and protecting the mental health of athletes is a key foundational step to achieving long-term success in competitive gymnastics.

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