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Research article

Effects of psychological safety and cognitive decentering on performance perception of young para-athletes: Mediation of athlete mindfulness in parasports education

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Abstract

Introduction. Research examining sport psychological safety among para-athletes remains limited. This study explores the effects of psychological safety and decentering on performance perception and investigates whether athlete mindfulness mediates the relationship between decentering and performance perception. The goal is to inform the development of sport-specific mindfulness programs tailored for para-athletes.

Materials and Methods. This cross-sectional correlational study was conducted following the STROBE checklist. A purposive sample of 110 para-athletes was recruited from the Punjab Sports Board in Pakistan. The research complied with the ethical standards of Hazara University, Pakistan. Valid and reliable instruments were employed, including the Sport Psychological Safety Inventory (Rice et al. 2022), the Decentering Scale for Sport (Zhang 2023b), the Sport Performance Perception Questionnaire (Adam et al. 2023), and the Athlete Mindfulness Questionnaire (Zhang 2023a). Participants completed pen-and-paper questionnaires from January to March 2025. Data were analyzed using IBM SPSS version 25. Statistical analyses included descriptive and inferential statistics, Pearson product-moment correlation, multiple regression, multivariate analysis of variance, independent samples t-test, and the Hayes PROCESS macro.

Results. Following normality tests, the application of Log10, and square root transformations, parametric tests were conducted. The Pearson product-moment correlation revealed significant positive associations among sport psychological safety, decentering, and performance perception. Multiple regression analysis indicated that both psychological safety and decentering are significant predictors of performance perception in para-athletes. The multivariate analysis of variance revealed a main effect of income and years in sport on all constructs. The Hayes PROCESS macro demonstrated that athlete mindfulness substantially mediates the relationship between decentering and performance perception.

Conclusion. Addressing mental health and psychological factors within sports education is essential. Promoting psychological safety in sports can support para-athletes, children with disabilities, and adolescents facing physical health challenges, thereby fostering a more inclusive sports culture. Emphasis should be placed on enhancing para-athletes' mindfulness through cognitive and behavioral therapeutic interventions.

Keywords: psychological safety, decentering, culture, mindfulness, performance

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Научная статья

Влияние психологической безопасности и когнитивной децентрации на восприятие результатов юными параспортсменами: опосредование осознанности спортсменов в параспортивном образовании

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Аннотация

Введение. Исследования психологической безопасности в спорте среди параспортсменов не распространены. Цель данного исследования — изучить влияние психологической безопасности и децентрации на восприятие спортивных результатов. В статье исследуется, является ли осознанность спортсмена посредником между децентрацией и восприятием результатов. Цель состоит в разработке специальных спортивных программ осознанности для параспортсменов.

Материалы и методы. Это перекрестное корреляционное исследование было проведено в соответствии с контрольным списком STROBE. Из Спортивного совета Пенджаба в Пакистане была отобрана целевая выборка из 110 спортсменов-паралимпийцев. Исследование проводилось в соответствии с этическими стандартами Университета Хазара (Пакистан). Были использованы надежные инструменты, в том числе методики психологической безопасности в спорте (Rice et al. 2022), децентрации в спорте (Zhang 2023b), восприятия результатов (Adam et al. 2023) и осознанности спортсмена (Zhang 2023a). С января по март 2025 года участники заполняли анкеты в формате «карандаш — бумага». Описательная статистика и логические выводы были выполнены с использованием IBM SPSS версии 25 (корреляции Пирсона, множественный регрессионный анализ, многомерный дисперсионный анализ, независимый выборочный тест и макрос Хейса).

Результаты. После проведения тестов на нормальность и анализа данных с использованием преобразований Log10 и SQRT были применены параметрические тесты. Корреляция Пирсона выявила сильную связь между психологической безопасностью в спорте, децентрацией в спорте и восприятием результатов. Множественный регрессионный анализ показал, что как психологическая безопасность, так и децентрация значительно влияют на восприятие результатов параспортсменами. Многомерный дисперсионный анализ выявил основное влияние дохода и стажа в спорте на все показатели. Макрос Хейса продемонстрировал значительное влияние осознанности спортсмена на взаимосвязь между децентрацией и восприятием результатов.

Заключение. Решение проблем психического здоровья в рамках спортивного образования имеет важное значение. Обеспечение психологической безопасности в спорте может оказать поддержку параспортсменам, детям и подросткам, сталкивающимся с проблемами физического здоровья; будет способствовать формированию более инклюзивной культуры в рамках спортивного образования. Особое внимание следует уделять повышению осознанности параспортсменов с помощью когнитивно-поведенческих терапевтических вмешательств.

Ключевые слова: психологическая безопасность, децентрация, культура, осознанность, результативность

Introduction

The integration of sports education and sports psychology is crucial for exploring mental health outcomes in various underrepresented populations. This study focuses on para-athletes affiliated with the Union Internationale de Pentathlon Moderne in Pakistan. Enhancing the sporting experience of para-athletes is essential, as it reflects human achievement and upholds inherent human dignity. Advocacy teams promote safeguarding systems within para-sport; however, ensuring the well-being of these athletes remains an ongoing challenge (Ruthland et al. 2022; Tuakli-Wosornu, Kirby 2021).

Furthermore, the complexities surrounding sport classification have sparked ongoing debates regarding disability sports (Sőnksen et al. 2018). It is vital to respect athletic differences within an ever-evolving global context while employing the biopsychosocial model. The socioeconomic status of para-athletes, including income and associated privileges, constitutes a significant social determinant of health that also warrants attention (Brown and White 2020). This study explores pathways to holistic well-being by promoting inclusivity and athlete-centered initiatives that are free from microaggressions or bias, thereby amplifying the voices of para-athletes (McNamee and Parnell 2021).

Both the Russian Federation and Pakistan are members of the sporting federations of the Union Internationale de Pentathlon Moderne; however, social inclusion for para-athletes requires greater focus in both regions. Empirical studies examining psychological safety, performance perception, and mindfulness in para-athletes are scarce. Consequently, there is a lack of tailored psychological interventions and therapies designed specifically for this population. Despite growing recognition of the link between sports performance and mental health, research on para-athletes remains limited.

A deeper understanding of mental health within sports education, particularly in the Paralympic context, is necessary. Disability sports involve specific stereotypes and stressors, including trauma, career transitions, athlete identity concerns, and challenges related to sports regulatory focus and psychological safety (Swartz et al. 2019). There is also a need to prioritize championship performance goals alongside individual psychological factors. This requires mental health support and cognitive training for para-athletes in both team and individual sports (Burns et al. 2019).

Currently, many athletes struggle with maintaining professional focus and experience heightened rumination concerning socioeconomic factors such as food security, leisure, and social capital. A lack of career security can adversely affect the mental and physical readiness required for optimal sports performance (Ryskin et al. 2019). Moreover, retrospective studies indicate that sport organizations supporting para-athletes frequently face funding constraints, which pose significant challenges (Sobiecka et al. 2019).

Sport psychological safety

Sport psychological safety is defined through three dimensions: a mentally healthy environment, mental health literacy, and low mental health stigma (Rice et al. 2022). When athletes feel psychologically safe, they are more likely to engage in health-seeking behaviors (Mikhailova et al. 2022). In patriarchal cultures, the emphasis on mental toughness and a winning-at-all-costs attitude can undermine psychological safety, particularly for male athletes. Psychological safety refers to the confidence to take risks and make mistakes without fear of negative judgment. The connection between psychological safety and mental well-being is an increasingly important area of study (Fransen et al. 2020). It plays a crucial role in fostering open communication, trust, and effective decision-making in elite sports (Ezhova 2025).

The International Olympic Committee's Mental Health in Elite Athletes Toolkit highlights the importance of psychological safety for understanding mental health outcomes and encourages timely support-seeking (Burrows et al. 2021). Research indicates that psychological safety is more effectively cultivated in team sports than individual sports (Saxe and Hardin 2022). Promoting both physical and psychological safety is essential within sports organizations. Mental health challenges can be addressed through proactive strategies that enhance both athlete safety and performance (Schinke et al. 2024). Para-athletes, in particular, face a heightened risk of depression if they perceive their training and competitive environments as psychologically unsafe (Beable 2024).

Decentering in sports

Decentering in sports refers to the cognitive ability to focus on thoughts and sensations as mental events rather than just factual information athletes encounter (Zhang 2023b). Decentering is a complex mental operation that involves introspection and capacity for detachment (Lange 2025). Challenges to decentering include a lack of integrated mindfulness practices within Paralympic sports education. Additionally, the specific stressors athletes face and their coping mechanisms are crucial for stress management and can further enhance decentering abilities (Loftus et

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al. 2022). Psychological tension and negative moods can act as significant barriers to achieving high performance. As a comparatively novel construct in sport psychology, dedicated training is needed to improve decentering, which may also assist in pain management (Diotauiuti et al. 2023).

Sport performance perceptions

Perceptions of sport performance are informed by frameworks such as the Long-Term Athlete Development Model (Balyi et al. 2013). This model encompasses several dimensions, including athlete development, mastery and growth, preparedness and strategy, recovery and injury prevention, and psychological skills (Adam et al. 2023). Sports performance can be enhanced through self-compassion — a potential outcome of effective athlete mindfulness training (Killham et al. 2018). For para-athletes, it is also essential to create a safe training environment for supporting the achievement of their sport-specific goals. It is important to note that many para-athletes often perceive themselves primarily as athletes first and secondarily as individuals; this perspective warrants re-evaluation (Miller et al. 2024).

Athlete mindfulness

Athlete mindfulness is a dispositional measure that encompasses three dimensions: present-moment attention, awareness, and acceptance (Zhang et al. 2023). The sports environment is saturated with stimuli that can trigger impulsivity and anxiety during peak performance. Para-athletes, in particular, frequently face critical judgments and negative evaluations, resulting in spectator pressure and mental stress during competitions. Athletes may respond with impulsive reactions or, alternatively, maintain a mindful state to manage errors effectively (Zhong et al. 2024). Mindfulness interventions have been shown to be effective in promoting positive sport behaviors. Achieving a flow state is closely associated with mindfulness, while higher mindfulness can reduce the likelihood of incidental sports injuries (Carraça et al. 2019). Furthermore, increased mindfulness is associated with improved healing imagery and reduced athletic pain levels (Mozafari Zadeh et al. 2019). Mental skills can be enhanced through emotional and self-regulation (Rogowska and Tataruch 2024).

Athlete mindfulness is also closely related to interoception, a concept gaining prominence in sports education. Interoception is a cognitive process that involves active monitoring of bodily sensations to effectively cope with challenging situations. During competitions, confidence, self-awareness, and positive body image are particularly critical for para-athletes (Seabury et al. 2023). Para-athletes with strong interoceptive awareness can better optimize their training, managing factors such as rest, sleep, and nutrition in accordance with their schedules (Wallman et al. 2021).

Materials and methods

This study utilized a correlational cross-sectional design with sample of 110 para-athletes recruited from a sports governing body in Pakistan affiliated with the Union Internationale de Pentathlon Moderne. The research complied with the ethical standards set by Hazara University, Pakistan. Written informed consent was obtained from all participants, who had an average age of 16.5 years. For participants under 16, parental consent was secured. The sample comprised professional swimmers, runners, and long jumpers. Inclusion criteria required participants to be proficient in English and fully registered with the governing body. A purposive sampling technique was employed.

Data were collected between January and March 2025, using pen-and-paper questionnaires. Initially, 200 surveys were distributed, with 110 being retained for analysis. Descriptive and inferential statistics were analyzed using IBM SPSS version 25. Data were screened for normality and discrepancies were addressed through Log10 and square root transformations. Parametric tests were employed, utilizing Pearson product-moment correlation, multiple linear regression analysis, multivariate analysis of variance (MANOVA), and the Hayes PROCESS macro. Additionally, independent sample t-tests were used to assess mean differences between athletes in individual and team sports. The study adhered to the EQUATOR network's STROBE guidelines for reporting.

The Sport Psychological Safety Inventory, designed by Rice and colleagues (Rice et al. 2022), served as a benchmark metric for assessing mental health culture in sports. This inventory comprises 11 items across three subscales: mentally healthy environment, mental health literacy, and low self-stigma. Items are rated on a 5-point scale from 'strongly disagree' to 'strongly agree'. Sample items include: 'My sport setting is a safe space to disclose mental health problems', and 'I know the mental health signs I should keep an eye on in sport settings'. The overall scale demonstrated a Cronbach's alpha greater than 0.70.

The Decentering Scale for Sport (Zhang 2023b) evaluates an athlete's capacity to focus on mental events without being fully absorbed by them. This scale consists of 12 unidimensional items scored

on a 5-point scale from 'never true' to 'always true'. A sample item is: 'During training and competition, I notice that all kinds of thoughts and feelings are temporary, not necessarily true'. The scale reported a Cronbach's alpha of 0.80.

The Sport Performance Perception Scale (Adam et al. 2023) measures retrospective views on sport performance, featuring a total of 32 items scored on a 7-point scale from 'almost never' to 'almost always'. It includes five subscales: athlete development, mastery and growth, preparedness and strategy, recovery and injury prevention, and psychological skills. Sample items include: 'I complete training that is event or position-specific', and 'I feel like I can manage my emotions in my training'. Cronbach's alpha values ranged from 0.89 to 0.94.

The Athlete Mindfulness Questionnaire (Zhang et al. 2023) consists of 16 items that assess athlete mindfulness across three subscales: present-moment attention, awareness, and acceptance. Sample items include: 'I can maintain my attention to my training', and 'I am aware of changes inside my body during competition'. Subscale Cronbach's alphas ranged from 0.73 to 0.89.

The hypotheses are as follows:

1. There is significant positive association among sport psychological safety, decentering, and sport performance perceptions.
2. Sport psychological safety and decentering are significant predictors of sport performance perceptions.
3. Athlete mindfulness significantly mediates the relationship between decentering and performance perception.
4. There is main impact of income and years in sport on psychological safety, decentering, sport performance perceptions, and athlete mindfulness.
5. There are significant mean differences in all the constructs based on sport type (individual vs. team).

Results

A total of 110 para-athletes participated in the study, comprising 75.5% males (83 individuals) and 23.6% females (27 individuals). Regarding income, 22.7% of participants earned between 30,000 to 60,000 PKR (approximately 8,214 to 16,429 rubles), 35.5% earned between 61,000 to 100,000 PKR (around 16,703 to 27,381 rubles), and 41% earned between 101,000 to 140,000 PKR (approximately 27,655 to 38,334 rubles). In terms of years in sport, 34.5% had 1 to 5 years of experience, 20.9% had 6 to 10 years, and 49% had more than 10 years of experience.

The age distribution was as follows: 63 para-athletes were aged 10–18 years, 41 were aged 19–30 years, and 6 were aged 31–50 years. Regarding sport type, 53 para-athletes competed in individual sports and 57 participated in team sports.

Table 1. Psychometrics

Scale	k	M	SD	α	Skewness	Kurtosis
SMHET	4	11.9091	2.53	0.82	–0.334	0.024
SMHLT	4	11.9182	2.27	0.80	–0.144	–1.316
SMLST	3	8.9818	1.89	0.84	–0.278	–0.220
SMHTT	11	32.8091	5.65	0.84	–0.112	–1.486
DT	12	40.9364	11.5	0.78	–0.078	–1.754
SPADT	6	29.5545	7.90	0.81	–0.116	–1.590
SPMDT	7	34.0909	8.97	0.80	0.005	–1.705
SPPST	7	33.6182	7.28	0.79	–0.084	–1.439
SPRT	8	38.5636	8.10	0.79	–0.108	–1.370
SPST	4	19.2273	4.82	0.84	–0.039	–1.336
SPTT	32	155.0545	34.4	0.83	–0.122	–1.855
APMT	6	21.4636	4.83	0.81	–0.100	–1.466
APAT	5	17.8273	4.19	0.82	–0.217	–1.357
AAT	5	17.7818	4.63	0.82	–0.088	–1.537
AMT	16	57.0727	12.7	0.87	–0.197	–1.643

Note: SMHET — mentally healthy environment, SMHLT — mental health literacy, SMLST — low self-stigma, SMHTT — sport psychological safety, DT — decentering for sports, SPADT — athlete development, SPMDT — mastery and growth, SPSST — strategy and preparedness, SPRT — recovery and injury prevention, SPST — psychological skills, SPTT — sport performance perceptions, APMT — present-moment attention, APAT — awareness, AAT — acceptance, AMT — athlete mindfulness.

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The scales showed robust normality, supporting the use of parametric testing. Cronbach's alphas indicated that scales have performed well in the sample with average reliability coefficient values from 0.79 to 0.87.

Table 2. Correlation

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. SMHET	–	0.558**	0.550**	0.759**	0.757**	0.722**	0.738**	0.735**	0.645**	0.673**	0.759**	0.696**	0.665**	0.674**	0.726**
2. SMHLT		–	0.573**	0.846**	0.748**	0.703**	0.736**	0.688**	0.698**	0.672**	0.756**	0.695**	0.684**	0.699**	0.741**
3. SMLST			–	0.814**	0.701**	0.669**	0.667**	0.684**	0.646**	0.639**	0.713**	0.644**	0.593**	0.608**	0.659**
4. SMHTT				–	0.877**	0.832**	0.852**	0.837**	0.788**	0.788**	0.885**	0.809**	0.774**	0.788**	0.846**
5. DT					–	0.877**	0.895**	0.877**	0.864**	0.805**	0.934**	0.829**	0.814**	0.667**	0.901**
6. SPADT						–	0.901**	0.846**	0.833**	0.766**	0.945**	0.827**	0.814**	0.854**	0.890**
7. SPMDT							–	0.884**	0.847**	0.782**	0.962**	0.865**	0.838**	0.853**	0.912**
8. SPPST								–	0.816**	0.776**	0.936**	0.833**	0.800**	0.833**	0.880**
9. SPRT									–	0.714**	0.919**	0.800**	0.832**	0.796**	0.865**
10. SPST										–	0.851**	0.774**	0.692**	0.761**	0.796**
11. SPTT											–	0.887**	0.856**	0.887**	0.942**
12. APMT												–	0.774 **	0.851**	0.941**
13. APAT													–	0.804**	0.913**
14. AAT														–	0.948**
15. AMT															–

Note: SMHET — mentally healthy environment, SMHLT — mental health literacy, SMLST — low self-stigma, SMHTT — sport psychological safety, DT — decentering for sports, SPADT — athlete development, SPMDT — mastery and growth, SPSST — strategy and preparedness, SPRT — recovery and injury prevention, SPST — psychological skills, SPTT — sport performance perceptions, APMT — present-moment attention, APAT — awareness, AAT — acceptance, AMT — athlete mindfulness.

Table 3. Multiple linear regression

Variables		B	T	p
Constant		–	1.927	0.05
SMHET		0.118	2.407	0.018
SMHLT		0.120	2.479	0.015
SMLST		0.096	2.136	0.035
DT		0.688	10.330	0.000
F	217.845			
R^2	0.94			

Note: SM — Sport psychological safety subscales, SMHET — mental health environment, SMHLT — mental health literacy, SMLST — low self-stigma, DT — decentering in sports

Table 4 shows a significant positive effect of mental health environment (B = 0.118, p < 0.05), mental health literacy (B = 0.120, p < 0.05), and low self-stigma (B = 0.096, p < 0.05) on sport psychological safety.

Table 4. Mediation

Effect	SE	B	T	P	LLCI	ULCI
Total effect	2.80	0.06	27.38	0.00	2.59	3.00
Direct effect	1.37	0.04	0.18	0.00	1.01	1.73
Indirect effect	1.43	0.02	0.20	0.00	1.04	1.81

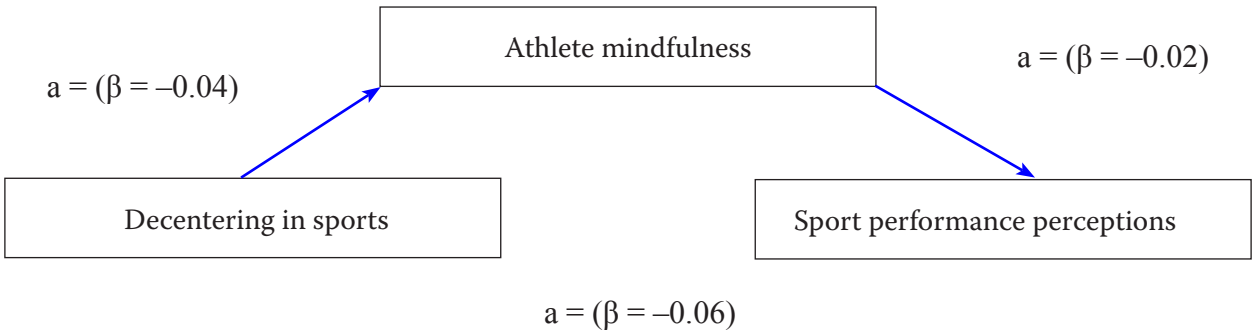

Fig. 1. Path diagram

Table 5. Independent sample t-test

Effect	Individual (n = 53)		Team (n = 57)		t	df	p
	M	SD	M	SD	–10.95	108	0.000
SMHET	10.00	1.94	13.68	1.54	–10.96	108	0.000
SMHLT	10.20	1.65	13.50	1.48	–9.76	108	0.000
SMLST	7.64	1.38	10.22	1.38	–16.76	108	0.000
SMHTT	27.84	3.44	37.42	2.49	–25.67	108	0.000
DT	29.90	5.04	51.19	3.57	–25.36	108	0.000
SPADT	22.20	3.87	36.38	3.02	–21.48	108	0.000
SPMDT	25.77	4.30	41.82	3.62	–21.19	108	0.000
SPPST	26.94	3.74	39.82	2.97	–20.04	108	0.000
SPRT	31.49	4.74	45.14	3.93	–16.35	108	0.000
SPST	15.28	3.05	22.89	2.86	–13.44	108	0.000
SPTT	121.6	15.25	186.07	8.07	–27.36	108	0.000
APMT	17.24	2.80	25.38	2.39	–16.30	108	0.000
APAT	14.18	2.63	21.21	1.91	–15.87	108	0.000
AAT	13.60	1.91	21.61	2.19	–17.60	108	0.000
AMT	45.09	6.67	68.21	3.79	–22.11	108	0.000

Note: SMHET — mentally healthy environment, SMHLT — mental health literacy, SMLST — low self-stigma, SMHTT — sport psychological safety, DT — decentering for sports, SPADT — athlete development, SPMDT — mastery and growth, SPSST — strategy and preparedness, SPRT — recovery and injury prevention, SPST — psychological skills, SPTT — sport performance perceptions, APMT — present-moment attention, APAT — awareness, AAT — acceptance, AMT — athlete mindfulness.

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Table 5 shows significant mean differences in sport psychological safety, decentering in sports, sport performance perceptions, and athlete mindfulness. Para-athletes in team sports reported higher mean scores across all constructs compared to those in individual sports.

Table 6. Multivariate Analysis of Variance

Source	Dependent variable	Type III Sum of squares	df	Mean square	F	p
Income	SMHTT	141.92	2	70.97	12.12	0.000
	DT	823.22	2	411.61	37.45	0.000
	SPTT	9361.53	2	4680.76	86.19	0.000
	AMT	1046.96	2	523.48	32.10	0.000
Years in sport	SMHTT	282.65	2	141.32	24.14	0.000
	DT	924.68	2	462.34	42.07	0.000
	SPTT	656.23	2	329.51	60.62	0.000
	AMT	977.63	2	488.82	29.98	0.000
Income*Years in sport	SMHTT	324.36	4	81.09	13.85	0.000
	DT	175.7	4	439.29	39.97	0.000
	SPTT	1461.64	4	3654.4	67.29	0.000
	AMT	1806.73	4	45.64	27.69	0.000

Note: SMHTT — sport psychological safety, DT — decentering in sports, SPTT — sport performance perceptions, AMT — athlete mindfulness.

Table 6 indicates that income and years in sport have a significant main effect on sport psychological safety, decentering in sports, and sport performance perceptions. A significant interaction effect between income and years in sport was also observed. Post-hoc test results are provided in the supplementary file.

Discussion

Table 1 demonstrates the robust psychometric properties of the scales used in this study. Table 2 reveals significant positive correlations among sport psychological safety, decentering, sport performance perceptions, athlete mindfulness, and its related subscales. Therefore, Hypothesis 1 is accepted. Previous research supports the idea that sport psychological safety is crucial for fostering positive perceptions of sport performance (Hut et al. 2023), particularly when athletes receive effective cognitive training. Understanding injury epidemiology within para-athlete populations further underscores the role of psychological safety in achieving sport-specific goals (Meidl et al. 2024).

Table 3 presents multiple regression analysis indicating that both psychological safety and decentering are significant positive predictors of sport performance perceptions in para-athletes. Approximately 90% of the variance in sport performance perceptions is accounted for by these two constructs. Thus, Hypothesis 2 is accepted. Decentering improves with mindfulness, especially when para-athletes experience lower levels of somatic and competitive anxiety (Yu et al. 2024). Several psychological determinants of safety are vital in achieving optimal performance, which is essential for para-athletes' cognitive engagement and success (Puce et al. 2019; Robinson et al. 2018).

Table 4 presents mediation analysis confirming that athlete mindfulness serves as a strong mediator between decentering and sport performance perceptions. As a result, Hypothesis 3 is accepted. Athlete mindfulness is associated with improved quality of life and translates into better sporting outcomes. Previous research indicates that athlete mindfulness significantly mediates sports performance (Heckman 2018). For instance, mindfulness programs have led to improved performance in soccer players (Baltzell et al. 2014). Single-session mindfulness therapy focusing on breath awareness helps reduce anxiety (Edwards et al. 2013). Combining athlete mindfulness with cognitive behavioral therapy and neurofeedback aids in attentional regulation and fosters healthier sporting attitudes (Ford et al. 2016). Similarly, mindfulness and relaxation training have been shown to support the emotional well-being of football players (Rooks et al. 2017).

Table 5 indicates that both income and years in sport significantly impact sport psychological safety, decentering, sport performance perceptions, and athlete mindfulness. Therefore, Hypothesis 4 is accepted. Research shows that para-athletes who are poorly compensated and have limited access to sports facilities may face exacerbated challenges, especially when confronted with future disabilities (Sobiecka et al. 2019). Higher income levels (Oggero et al. 2021) and longer years in sport correlate with elevated levels of psychological safety, decentering, sport performance perceptions, and athlete mindfulness.

Finally, Table 6 highlights significant mean differences between athletes in individual and team sports, leading to the acceptance of Hypothesis 5. Para-athletes in team sports benefit from social connections forged through friendly matches (Kokun and Shamych 2016). Sports can serve as a bonding platform, with support from national teammates, friends, and fellow athletes enhancing psychological safety, decentering, and overall performance levels (Rodríguez Macías et al. 2022). Para-athletes who participate in individual sports, especially those with fewer years of experience and younger age, demonstrate lower scores in sporting psychological safety, decentering, performance perception, and athlete mindfulness compared to their counterparts in team sports, who tend to have more extensive experience, be older, and score higher across all constructs (Vella et al. 2024).

Conclusion

Cross-cultural online training programs hold significant potential for enhancing para-athlete well-being. Research indicates that computerized cognitive behavioral therapy, delivered through modules, can build psychological safety skills, making it a valuable resource for this population (Ely 2023). The role of the coach is also paramount; an empathetic and emotionally intelligent coach is critical for managing national Paralympic teams. The strategic use of humor can serve as a subtle yet effective tool for promoting team satisfaction and athlete well-being (Alexander-Urquhart et al. 2024).

Additionally, practices involving self-talk can positively influence sport performance perceptions by improving attentional focus (Grushkoa et al. 2019). Mobile-based mindfulness programs have shown promise in helping para-athletes manage anxiety effectively (Gao et al. 2024). It is also essential to tailor Rational Emotive Behavior Therapy for para-athletes to mitigate anxiety, as it can impact athlete mindfulness and decentering capacities (Ali et al. 2025).

For coaches of elite sports teams, access to real-time data is crucial for scheduling training that supports both physical and mental well-being (Shestakov and Myakinchenko 2018). A comparative study involving the Russian Federation and other countries underscores the importance of both physical and psychological training, particularly in fostering psychological compatibility during sports type selection for overall well-being (Osipov et al. 2017). Furthermore, incorporating advanced sporting technologies to adapt to changing sports landscapes can assist athletes with disabilities, similar to the advancements seen in the Cybathlon Games (Barker and Parker 2024).

Конфликт интересов

Авторы заявляют об отсутствии конфликта интересов, как явного, так и потенциального. Данные, представленные в этой статье, были получены в исследовании, одобренном Punjab Sports Board, Pakistan.

Conflict of Interest

The authors declare that there is no conflict of interest, either existing or potential. The data reported in this article were obtained in a study approved by Punjab Sports Board, Pakistan.

Соответствие принципам этики

Программа исследования и ее протокол были одобрены Комитетом по этике Пенджабского спортивного совета Пакистана и Университетом Хазара в Пакистане. Авторы сообщают, что исследование соответствовало этическим принципам исследований с участием людей и/или животных.

Ethics Approval

The research program and its protocol were approved by the Ethics Committee of the Punjab Sports Board, Pakistan, and Hazara University Pakistan. The authors report that the study complied with the ethical principles for research involving human and/or animal subjects.

Вклад авторов

Юмна Али: методология, программное обеспечение, валидация, формальный анализ, курирование данных, администрирование проекта.

Сайед Мубашар Икбал Шах: концептуализация, методология, валидация, формальный анализ, исследование, ресурсы, обзор, курирование данных, администрирование проекта.

Все авторы прочитали и согласились опубликовать эту версию рукописи.

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Author Contributions

Yumna Ali: Methodology, Software, Formal analysis, Data Curation, Project Administration.

Syed Mubashar Iqbal Shah: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Review, Data Curation, Project Administration. Validation all authors. All authors have read and agreed to publish this version of manuscript.

Заявление о доступности данных

Данные доступны по закрытой ссылке по адресу URL: 10.6084/m9.figshare.29251658

Data Availability Statement

The data are available through the private link at URL: 10.6084/m9.figshare.29251658

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