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Short communication

Family cohesion, children's thoughts, and children's cognitive assessments: Mediating role of sport anxiety

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Abstract

Introduction. The aim of this quantitative cross-sectional correlational study is to explore the relationship between family cohesion and children's cognitive assessments. Today, against the backdrop of digitalization, it is crucial to emphasize the importance of sports to ensure people have more physical activity. From the perspectives of sports psychology and education, understanding the role of parental involvement, family bonding, and boundaries is essential for exploring their impact on children's sports performance.

Materials and Methods. A purposive sampling technique was employed, selecting 200 sports education students and trainees. Informed written consent was obtained from all participants prior to data collection. Following formal consent procedures, valid and reliable instruments were used. Data analysis was conducted using IBM SPSS Version 25, employing both descriptive and inferential statistics. Statistical methods included Pearson's correlation, logistic regression, the Hayes' PROCESS Macro, and analysis of variance (ANOVA). The Family Cohesion Scale (FACES II; Olson et al. 1983), the Children's Thoughts Questionnaire (CTQ; (Marien et al. 2007)), the Children's Cognitive Assessment Questionnaire (CCAQ; Zatz, Chassin 1985) and the Sport Anxiety Scale (Smith et al. 2007) were the primary instruments used.

Results. Data normalization was performed, adjusting for normality using Shapiro-Wilk tests, skewness, and kurtosis values. Parametric tests were applied, and Pearson's product-moment correlation revealed significant associations. Multiple logistic regression analysis showed that both family cohesion and children's thoughts positively influenced children's cognitive assessments. Hayes' PROCESS Macro further demonstrated that sport anxiety has a significant mediating effect between thoughts and cognitive outcomes, including negative self-evaluations, off-task evaluations, positive self-evaluations, and on-task thoughts.

Conclusions. Proactive family involvement in children's sports education is crucial. Families serve as valuable resources that support progress in training and sports performance. They also influence children's cognitive responses, particularly in terms of self-evaluations (both positive and negative), off- and on-task thoughts.

Keywords: family cohesion, children's thoughts, children's cognitive assessment, sport anxiety, Pakistan

Краткое сообщение

Сплоченность семьи, мысли детей и их когнитивная оценка: опосредующая роль спортивной тревожности

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Аннотация

Введение. Целью этого количественного поперечного корреляционного исследования является изучение взаимосвязи между сплоченностью семьи и когнитивными оценками детей. Сегодня, на фоне цифровизации, крайне важно подчеркнуть важность спорта для обеспечения большей физической активности людей. С точки зрения спортивной психологии и образования, понимание роли родительского участия, семейных связей и границ необходимо для изучения их влияния на спортивные результаты детей.

Материалы и методы. Использовалась целенаправленная выборка. Было отобрано в общей сложности 200 студентов и стажеров спортивных учебных заведений. От участников было получено письменное информированное согласие на участие в исследовании. Для интерпретации описательной и логической статистики использовался IBM SPSS версии 25. Применялись корреляционный анализ, логистическая регрессия, макро-анализ процесса Хейса и дисперсионный анализ, Шкала сплоченности семьи FACES II (Olson et al. 1983), опросник «Мысли детей» (Marien et al. 2007), опросник когнитивной оценки детей CCAQ (Zatz, Chassin 1985) и опросник спортивной тревожности (Smith et al. 2007).

Результаты. Данные были скорректированы в соответствии со значениями Уилка, асимметрии и эксцесса Шапиро. Использовалось параметрическое тестирование. Корреляция момента продукта Пирсона продемонстрировала значимые связи. Множественный логистический регрессионный анализ показал, что сплоченность семьи и мысли детей оказывают значительное положительное влияние на когнитивные способности детей. Макроанализ процесса Хейса был использован для того, чтобы показать, что спортивная тревожность характеризуется взаимосвязью между мыслями и когнитивными аспектами негативных оценок вне задания, положительных оценок и мыслей, связанных с выполнением задания.

Заключение. Активное участие семьи в развитии детского спортивного образования является его неотъемлемой частью. Семья — это ценный ресурс, который помогает в учебном процессе, в том числе в спортивном образовании. Близкие люди дополнительно влияют на когнитивные реакции детей: негативную/позитивную самооценку, мысли, отвлекающие внимание от выполнения задач (off-task thoughts) и когнитивные способности, которые помогают фокусироваться на задачах (on-task thoughts).

Ключевые слова: сплоченность семьи, мышление детей, когнитивная оценка детей, спортивная тревожность, Пакистан

Introduction

Research on the sports community, specifically concerning children, remains underexplored in Pakistan. This study aims to contribute to the fields of sports and child psychology by examining the dynamics of family cohesion, children's thoughts on anxiety and depression, cognitive assessments, and sport anxiety.

Family cohesion

The family plays a pivotal role as a primary social unit. Family cohesion refers to the emotional bonds that connect family members, influencing the

family's adaptability — its ability to adjust power structures, roles, and meet situational needs. To assess these dimensions, the Family Adaptability and Cohesion Evaluation Scale was developed (Olson et al. 1983; Olson 2000). The Circumplex Model posits that emotions are processed within an 'emotional space' characterized by two subdimensions: valence and arousal (Olson et al. 1979). The model emphasizes the interconnectedness of family cohesion, flexibility, and communication. A study by (Carron, Chelladurai 1981) examined the role of family and team sports cohesiveness among athletes. It was found that cohesion fostered a sense of belonging, membership, and enjoyment, as well as closeness within teams. Cohesion in sports was influenced by the nature of the task and the interaction between athletes and coaches. Cohesion is recognized as a crucial factor in reducing sports anxiety and enhancing performance, particularly among Chinese athletes. It also promotes psychological collectivism to foster engagement (Lehto et al. 2012). Moreover, family cohesion was identified as a significant mediator between aggression and sports mindfulness in an Iranian football team sample (Gharibvand et al. 2022). A study of Taiwanese adolescents highlighted that family cohesion plays an important role in predicting anxiety, depression, and deviance during childhood (Lin, Yi 2019). Research from Argentina suggests that elite athletes perceive family cohesion differently than recreational athletes, underscoring its significance in the development of children's opportunities to succeed in sports (Raimundi et al. 2019). In Brazilian youth athletes, family cohesion is linked to group cohesion, which ultimately fosters social cohesion within the sporting context (Freire et al. 2023).

Children's thoughts

Children's thoughts are often conceptualized in terms of the anxiety and depression they experience at specific developmental stages (Marine, Bell 2007). A study conducted on a sample of young athletes in Australia, ranging in age from 12 to 17, highlighted the importance of mental health, particularly regarding the experience of depressive and anxious thoughts among male athletes (Swann et al. 2018). Furthermore, children and adolescents in Sweden have been found to experience suicidal ideation, while the sense of coherence and coping strategies play a crucial role in mental well-being. The study emphasized the need for a safe environment where children can discuss personal issues, as they are at a heightened risk of abuse by senior athletes. Notably, many of the children in the sample came from immigrant families (Timpka et al. 2021). In a study of Russian and Bulgarian sports students, significant differences were observed across such factors as fame type, qualifications, and nationality. The researchers also noted that anxiety and depression could persist due to factors such as an unpredictable sports calendar and a lack of information regarding athletes' physical condition (Iancheva et al. 2020).

Children's cognitive assessments

Children's cognitive assessments include off-task thoughts, on-task thoughts, negative evaluations, and positive evaluations. However, this measure has rarely been applied in the context of children's sports psychology. In a study of a Turkish sample of elementary school students, it was found that girls exhibited better autonomic responses to test anxiety compared to their boys (Aydın 2019). Similarly, in a German sample of students aged 9 to 15 years, those who experienced social anxiety tended to have more negative cognitive evaluations and fewer positive cognitive evaluations. The emotional bonding within the family was identified as a key factor influencing these cognitive patterns (Schwarz et al. 2020).

Sport anxiety

Sport anxiety is defined as a persistent sense of tension characterized by somatic symptoms, worry, and concentration disruption. It has been suggested that sports coaches should focus on creating a positive motivational climate as an intervention to reduce sport anxiety in young athletes (Greenlees 2021).

Methods

This study has a quantitative cross-sectional correlational design. The sample was drawn from a sports institution that granted permission for data collection across five sports — fencing, jumping, shooting, swimming, and running. These sports are recognized as the five integrated sports of the International Federation. The participants were selected through purposive sampling. The sample consisted of children aged 5 to 12 years, enrolled either in primary or secondary school. Written informed consent was obtained from the parents or guardians of the children. Initially, 280 pen-and-paper questionnaires were distributed, of which 200 were completed and returned, yielding a response rate of 71.4%. The parametric Pearson correlation analysis, with an effect size of 0.3, G*Power 3.1 indicated that a minimum sample size of 134 was required. Importantly, the sample included only those children who could understand, read and respond to simple English language statements (see Table 1).

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Table 1. Demographics

Variable	N	Percent
Gender		
Male	102	51.0
Female	98	49.0
Education		
Primary	75	37.1
Secondary	125	62.6
Type of sport		
Fencing	26	13.0
Shooting	35	17.5
Running	62	31.0
Swimming	57	28.5
Jumping	20	10.0
Disposable income (PKR)		
100,000–200,000	41	20.5
200,000–400,000	57	28.5
400,000–600,000	48	24.0
More than 600,000	54	27.0

Hypotheses

1. There is significant association between family cohesion, children's thoughts, cognitive assessments, and sport anxiety.
2. Family cohesion and children's thoughts significantly affect children's cognitive assessments.
3. Sport anxiety has a significant mediating effect between thoughts and cognitive outcomes, including negative evaluations, off-task evaluations, positive evaluations, and on-task thoughts.
4. Gender, income, and type of sport have a significant main effect on family cohesion, children's thoughts, cognitive assessments, and sport anxiety.

Statistical methods

1. Pearson product-moment correlation was used to test the relationships between variables.
2. Logistic regression was used to test regression models.
3. Hayes' PROCESS Macro was used to assess mediating effects.
4. Multivariate analysis of variance (MANOVA) was used to examine the main effects of gender, income, and type of sport.

Scales (see Table 2)

Table 2. Psychometrics

Variable	A	*K*	*M*	*SD*	Skewness	Kurtosis
Family cohesion	0.792	8	24.17	8.234	0.072	–1.745
Children's thoughts	0.978	36	670.69	735.579	1.520	1.655
Negative evaluation	0.696	10	16.62	3.286	0.493	–0.015
Off-task thoughts	0.702	10	15.57	2.461	0.062	–1.129
Positive evaluations	0.707	10	14.85	2.426	–0.269	–0.951
On-task thoughts	0.704	10	13.97	2.332	0.695	0.250
Somatic symptoms	0.769	3	55.27	18.623	0.132	–1.353
Worry	0.742	4	13.1200	4.64797	0.116	–1.288
Concentration disruption	0.737	4	13.2261	4.86007	0.064	–1.336
Sport anxiety	0.764	21	55.27	18.623	0.132	–1.353

Note: α = Cronbach's alpha, K = number of items, M = mean, SD = standard deviation.

The Family Cohesion Scale (FACES II; Olsen et al. 1983) includes three forms. In this study, the 8-item version was used, which is rated on 5-point Likert scale ranging from 1 = almost never or never to 5 = almost always or always. Some of the items include: 'Our family did things together' and 'We approved of each other's friends'.

The Children's Thoughts Questionnaire (CTQ; Marine, Bell 2007) is a 60-item psychometric survey that includes situational items related to anxiety and depression-related thoughts, serving as a cognitive measure. Th CTQ is rated on a 5-point Likert scale ranging from 1 = not at all like I would think to 5 = exactly like I would think.

The Children's Cognitive Assessment Questionnaire (Zatz, Chassin 1985) is a 40- item survey with five subscales: negative self-evaluation, positive self-evaluation, self-distracting thoughts (off-task thoughts), and cognitions focused on the task (on-task thoughts). It uses a dichotomous scale.

The Sport Anxiety Scale (Smith et al. 2007) is a 36-item survey designed to measure sport-specific cognitive and somatic trait anxiety. The instrument has three subscales: somatic symptoms, worry, and concentration disruption. It is rated on a 4-point scale ranging from 1 = not at all to 4 = very much.

Results

Table 3 shows the correlational analysis among all the constructs. Family cohesion demonstrated a strong negative correlation with children's anxiety and depression-related thoughts ($r = -0.654$, $p < 0.001$), a weak negative correlation with negative evaluations in the course of cognitive assessment ($r = -0.113$, $p < 0.001$), and a strong positive correlation with off-task thoughts. Additionally, family cohesion showed a strong negative correlation with sport anxiety ($r = -0.879$, $p < 0.001$) and its subscales: somatic symptoms ($r = -0.851$, $p < 0.001$), worry ($r = -0.871$, $p < 0.001$), and concentration disruption ($r = -0.850$, $p < 0.001$).

Table 4 shows regression analysis to explore the effect of family cohesion, children's thoughts and sport anxiety on cognitive assessment. Family cohesion has a significantly positive effect on cognitive assessments of children ($\beta = 0.038$, $p = 0.007$), while children's thoughts have a negative significant effect

Table 3. Correlational Analysis

Variables	1	2	3	4	5	6	7	8	9	10
1. Family cohesion		–0.654**	–0.113	0.670**	–0.692**	–0.527**	–0.879**	–0.851**	–0.871**	–0.850**
2. Children's thoughts			–0.008	–0.483**	0.545**	0.402**	0.633**	0.627**	0.623**	0.601**
3. Negative evaluations				–0.251**	0.178*	–0.209**	0.306**	0.268**	0.294**	0.256**
4. Off-task thoughts					–0.556**	–0.259**	–0.664**	–0.639**	–0.667**	–0.615**
5. Positive evaluations						0.262**	0.717**	0.681**	0.699**	0.675**
6. On-task thoughts							0.349**	0.352**	0.369**	0.334**
7. Sport anxiety								0.957**	0.962**	0.951**
8. Somatic symptoms									0.930**	0.929**
9. Worry										0.891**
10. Concentration disruption										

Note: $p < .001$*.

Table 4. Regression analysis

Variables	B	t	P
(Constant)		16.622	0.000
Family cohesion	0.038	0.266	0.007
Children's thoughts	–0.063	–0.737	0.042
Somatic symptoms	–0.124	–0.544	0.054
Worry	0.124	0.485	0.628
Concentration disruption	–0.145	–0.640	0.054
R^2	0.226		
F	9.375		

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on cognitive assessments (β = –0.063, p = 0.042). Somatic symptoms (β = –0.124, p = 0.054) and concentration disruption (β = –0.640, p = 0.054) has a significant negative effect on children's cognitive assessments.

Hayes' PROCESS analysis of mediation shows that sport anxiety significantly mediates between family cohesion and children's cognitive assessments (see Table 5).

Table 6 shows that the outcomes of sports performance have a significant impact on family cohesion, children's thoughts, their negative and positive evaluations as well as off- and on-task thoughts.

Table 6.1 shows that disposable income has a significant T main effect on family cohesion, children's thoughts, their positive evaluations, on-task thoughts and off-task thoughts as well as sport anxiety.

Gender was found to have no pronounced effect on either of the three constructs, except for off-task thoughts (see Table 6.2).

Table 6.3 shows the main interaction effects. There is no main interaction effect of gender and disposable income as well as no main interaction for gender and type of sport. However, there are main effects of disposable income and fame on negative and positive evaluations as well on-task thoughts. No main interaction effect for gender, disposable income or fame were found to be significant.

Table 5. Mediation analysis

Effect	SE	B	t	P
Total effect	0.001	0.001	3.674	0.000
Direct effect	0.000	0.000	–0.860	0.391
Indirect effect	0.002	0.002		

Note: SE = standard error, β = Beta, p = significance level.

Table 6. Multivariate analysis of variance

Tests of between-subjects effects						
Source	**Dependent variable**	**Type III Sum of squares**	**Df**	**Mean square**	**F**	**Sig.**
Type of sport	F	878.490	4	219.622	3.396	0.010
	CT	4769477.258	4	1192369.315	2.259	0.064
	CN	124.427	4	31.107	2.996	0.020
	CO	56.899	4	14.225	2.416	0.050
	CP	44.204	4	11.051	1.912	0.110
	COT	60.385	4	15.096	2.882	0.024
	S	1887.683	4	471.921	1.371	0.245

Table 6.1. Tests of between-subjects effects

Source	Dependent variable	Type III Sum of squares	df	Mean square	F	Sig.
Disposable income	F	10492.425	3	3497.475	228.620	0.000
	CT	47285934.126	3	15761978.042	51.158	0.000
	CN	39.801	3	13.267	1.233	0.299
	CO	455.784	3	151.928	39.737	0.000
	CP	536.055	3	178.685	55.115	0.000
	COT	311.333	3	103.778	26.399	0.000
	S	48144.471	3	16048.157	150.709	0.000

Table 6.2. Tests of between-subjects effects

Source	Dependent variable	Type III Sum of squares	df	Mean square	F	Sig.
Gender	F	0.531	1	0.531	0.008	0.930
	CT	282096.817	1	282096.817	0.520	0.472
	CN	62.186	1	62.186	5.901	0.016
	CO	1.402	1	1.402	0.231	0.632
	CP	0.650	1	0.650	0.110	0.741
	COT	1.261	1	1.261	0.231	0.631
	S	541.685	1	541.685	1.566	0.212

Table 6.3. Tests of between-subjects effects

Source	Dependent variable	Type III Sum of squares	df	Mean square	F	Sig.
Gender * disposable income	F	82.608	3	27.536	1.815	0.146
	CT	850780.067	3	283593.356	0.837	0.475
	CN	48.513	3	16.171	1.877	0.136
	CO	42.330	3	14.110	4.501	0.005
	CP	10.465	3	3.488	1.234	0.299
	COT	17.151	3	5.717	1.450	0.230
	S	163.327	3	54.442	0.525	0.666
Gender * type of sport	F	109.925	4	27.481	1.811	0.129
	CT	208163.955	4	52040.989	0.154	0.961
	CN	47.443	4	11.861	1.377	0.244
	CO	31.268	4	7.817	2.494	0.045
	CP	44.841	4	11.210	3.967	0.004
	COT	4.667	4	1.167	0.296	0.880
	S	750.440	4	187.610	1.810	0.129
Disposable income * type of sport T	F	99.723	12	8.310	0.548	0.880
	CT	2175484.168	12	181290.347	0.535	0.889
	CN	264.399	12	22.033	2.557	0.004
	CO	61.942	12	5.162	1.647	0.083
	CP	69.793	12	5.816	2.058	0.022
	COT	27.663	12	2.305	0.585	0.853
	S	673.265	12	56.105	0.541	0.885
Gender * income disposable * type of sport	F	90.139	9	10.015	0.660	0.744
	CT	378897.360	9	42099.707	0.124	0.999
	CN	107.052	9	11.895	1.381	0.201
	CO	44.414	9	4.935	1.574	0.127
	CP	47.488	9	5.276	1.867	0.060
	COT	16.497	9	1.833	0.465	0.896
	S	655.351	9	72.817	0.702	0.706

Note: F = Family cohesion, CT = Children's thoughts, CN = Negative evaluations, CO = Off-task thoughts, CO = On-task thoughts, CP = Positive evaluation, COT = Children's cognitive assessment, S = Sport anxiety.

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Discussion

In children embracing sports, family cohesion encourages higher self-esteem, enjoyment, and intrinsic motivation ensuring sustained participation. The model proposed by J. A. Fredrick and J. S. Eccles' (Fredricks, Eccles 2005) suggests that girls require supportive opportunities and role models, particularly from their parents, to develop self-beliefs that translate into sports and physical activity. Interestingly, mothers tend to provide more support to girls as compared to fathers (Davison, Jago 2009). Without parental encouragement, girls who feel pressured to perform may experience higher levels of anxiety (Bois et al. 2009). Similarly, coaches have a significant influence on girls' psychological outcomes in terms of motivation (Weiss, Weiss 2007).

Children from low-income backgrounds may face barriers to sports participation. Sports, however, can offer significant emotional and social benefits. Research findings indicate that families with lower income tend to exhibit lower family cohesion associated with higher levels of depression and anxiety in children, as well as increased negative self-evaluations and off-task thoughts. These results align with previous studies showing that children from low-income households face a variety of challenges that prevent them from engaging in sports (Nelson et al. 2022).

Conclusion

It is crucial to develop targeted interventions for sports-related concussions, as children, particularly those in elementary and middle school, are more vulnerable to such injuries, which can lead to long-term cognitive issues. In addition, family-integrated therapies are important and should be delivered by sports coaches and sports psychologists. However, Pakistan now lacks registered sports psychologists who can collaborate directly with families and provide sports-related counselling services. Moreover, sports students from Pakistan have participated in countries around the world yet require international sports trainers to intervene for better cross-cultural learning.

Ontological coaching interventions are also essential in children's sports. Coaching frameworks should incorporate positive youth development, life skills training, and humanistic coaching principles to support psychological growth of children and youth (Bloom et al. 2020).

Конфликт интересов

Авторы заявляют об отсутствии потенциального или явного конфликта интересов.

Conflict of Interest

The authors declare that there is no conflict of interest, either existing or potential.

Соответствие принципам этики

Авторы заявляют, что исследование соответствует институциональным академическим и исследовательским принципам страны, где проводится исследование.

Ethics Approval

The authors declare that the study complies with the institutional academic and research principles of the country where the study is conducted.

Вклад авторов

Юмна Али: концептуализация, анализ данных, написание оригинального проекта, ресурсы, администрирование проекта, формальный анализ и проверка.

Сайед Мубашар Икбал Шах: концептуализация, сбор данных, ресурсы, корректура и проверка.

Authors' contributions

Yumna Ali: conceptualization, data analysis, writing original draft, resources, project administration, formal analysis and validation.

Syed Mubashar Iqbal Shah: conceptualization, data collection, resources, proof reading and validation.

Заявление о доступности данных

Данные доступны у соответствующего автора и предоставляются по обоснованному запросу.

Data availability statement

The data is available with the corresponding author and is provided on reasonable request.

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