



## Psychological Skills Training and Athletic Performance: A Quasi-Experimental Investigation among University Athletes in Pakistan

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### ABSTRACT

**Background:** Although Psychological Skills Training (PST) has demonstrated robust efficacy in Western athletic contexts, its systematic investigation in Pakistani university sport remains limited, despite the sector's strategic importance within the national athlete development pathway.

**Objective:** This study examined the effectiveness of a structured eight-week PST intervention on athletic performance, competitive anxiety, and self-confidence among university athletes across Pakistan.

**Methods:** A sequential explanatory mixed-methods design was employed. In the quantitative phase, a quasi-experimental pretest–posttest design was used with an experimental group ( $n = 210$ ) and a matched control group ( $n = 210$ ) drawn from eight universities across all four provinces of Pakistan. Athletes represented ten sports disciplines. Validated instruments the Athletic Coping Skills Inventory-28 (ACSI-28), Ottawa Mental Skills Assessment Tool-3 (OMSAT-3), and Competitive State Anxiety Inventory-2R (CSAI-2R) assessed psychological outcomes alongside standardized sport-specific performance metrics. The PST intervention comprised eight weekly two-hour group sessions covering progressive relaxation, PESTLEP-informed imagery, cognitive restructuring, self-talk, attention control, and goal setting, delivered in Urdu. A qualitative phase involved semi-structured interviews with 30 athletes and 15 coaches.

**Results:** All five primary hypotheses were supported. The experimental group demonstrated significantly greater improvements in PST skill levels ( $d = 1.44$ ), sport-specific performance ( $d = 1.01$ ), cognitive anxiety reduction ( $d = 1.23$ ), somatic anxiety reduction ( $d = 1.06$ ), and self-confidence ( $d = 1.29$ ) compared to controls (all  $p < .001$ ). Mean sport-specific performance improved by 18.4% ( $SD = 4.2\%$ ) in the experimental group versus 2.1% ( $SD = 1.8\%$ ) in controls.

*Sport type significantly moderated PST effectiveness, with individual sport athletes demonstrating greater gains ( $d = 1.61$ ) than team sport athletes ( $d = 1.28$ ).*

**Conclusion:** *A culturally adapted, Urdu-delivered PST program produced large, practically meaningful improvements across all measured outcomes. The study introduces the Pakistan University Athletic Psychological Skills (PUAPS) Framework as a culturally informed model for PST implementation in South Asian Muslim-majority sporting contexts.*

**Keywords:** *Psychological Skills Training; Athletic Performance; University Athletes; Pakistan; Mental Imagery; Competitive Anxiety; Cultural Adaptation; Sport Psychology*

### **Introduction**

Athletic performance is shaped not only by physiological capacity and technical proficiency but also by the quality of mental preparation athletes bring to training and competition. As margins between elite competitors narrow, psychological superiority has emerged as a decisive differentiating variable (Weinberg & Gould, 2023; Williams & Krane, 2021). Psychological Skills Training (PST) defined as the systematic learning and rehearsal of mental strategies to optimize psychological functioning during athletic preparation and competition (Vealey, 2007) represents one of the most extensively researched interventions in sport science, with meta-analytic evidence consistently confirming its efficacy across diverse sports and performance levels (Greenspan & Feltz, 1989; Meyers et al., 1996).

The canonical PST skill set encompasses goal setting, mental imagery, self-talk, arousal regulation, attentional control, and confidence enhancement. Goal-setting theory (Locke & Latham, 2002) provides the empirical foundation for understanding how specific, challenging targets direct effort and sustain motivation. Mental imagery activates shared neural substrates with actual movement the functional equivalence hypothesis (Jeannerod, 1994) enabling skill rehearsal without physical execution. Self-talk interventions yield moderate but robust performance effects (weighted  $g = 0.48$ ; Hatzigeorgiadis et al., 2011), with motivational content benefiting endurance tasks and instructional content benefiting fine-motor precision. Arousal regulation techniques, including progressive muscular relaxation and diaphragmatic breathing, enable athletes to modulate activation states toward individually optimal zones (Hanin, 2000). Together, these skills form an interconnected psychological architecture that supports consistent high performance across competitive conditions.

Despite a substantial international evidence base, PST research has been criticized for relying predominantly on Western, Educated, Industrialized, Rich, and Democratic (WEIRD) samples (Henrich et al., 2010), leaving the cross-cultural generalizability of PST frameworks inadequately examined (Schinke & Hanrahan, 2009). Pakistan constitutes a particularly salient but understudied context for PST investigation. As a nation of over 240 million people with a rich competitive tradition in cricket, field hockey, squash, and wrestling, Pakistan produces internationally competitive athletes despite significant institutional resource constraints, collectivist sociocultural norms, Islamic religious orientations, and gender-based participation inequalities (Farooq, 2018; Iqbal & Shahzad, 2021). University sport serves as a critical developmental bridge between school-level talent identification and professional competition, yet systematic psychological support for this athlete cohort remains almost entirely absent.

Existing Pakistani sport psychology literature, while growing, consists predominantly of small-scale, single-sport survey studies without intervention components, control group comparisons, or mixed-methods designs (Shahzad & Naeem, 2011; Chaudary, 2020). No previous study has implemented, evaluated, and reported a structured multicomponent PST program with Pakistani university athletes using validated instruments, objective performance

metrics, and qualitative investigation of cultural mediators. This methodological gap constitutes the primary motivation for the present investigation.

The study aimed to: (a) assess the impact of an eight-week PST intervention on psychological skill levels, competitive anxiety, self-confidence, and objective sport-specific performance; (b) examine the moderating roles of gender, sport type, competitive experience, and university type; (c) explore cultural, institutional, and motivational factors shaping PST adoption and effectiveness; and (d) develop and propose a culturally adapted PST framework for Pakistani university sport. Based on established theoretical models and the broader PST literature, we hypothesized that the experimental group would demonstrate significantly greater improvements than controls on all primary outcome variables, with gender and sport type moderating intervention effectiveness.

## **Methods**

### **Research Design**

A sequential explanatory mixed-methods design (Creswell & Plano Clark, 2018) was employed, integrating a quasi-experimental quantitative phase with a qualitative explanatory phase. The quantitative phase utilized a pretest–posttest design with a matched control group. Full randomization was not feasible given team-based organizational structures and the ethical imperative of not indefinitely withholding potentially beneficial training; threats to internal validity were mitigated through group matching, statistical covariate control, and treatment fidelity monitoring. Ethical approval was obtained from the Institutional Research Ethics Committee, and all participants provided written informed consent.

### **Participants and Sampling**

The target population comprised student athletes enrolled at HEC-recognized Pakistani universities who were formally registered members of their university sports teams. A stratified purposive sampling strategy selected eight universities two from each of Pakistan's four provinces ensuring representation across provincial/private university types, institutional resource levels, and geographic regions. Within each university, eligible participants were identified through sports directors and coaches across ten sports disciplines: cricket, football, hockey, squash, badminton, athletics, wrestling, swimming, volleyball, and basketball. Eligibility criteria required current full-time enrollment, active interuniversity competition participation, no prior formal PST involvement, and absence of any injury precluding full training participation.

A total of 420 student athletes were recruited (experimental:  $n = 210$ ; control:  $n = 210$ ). The sample comprised 280 male (66.7%) and 140 female (33.3%) athletes, with a mean age of 20.9 years ( $SD = 2.0$ ), mean training experience of 5.3 years ( $SD = 2.7$ ), and mean competitive experience of 3.1 years ( $SD = 1.7$ ). Only 5.2% of participants reported any prior formal PST exposure. The experimental and control groups were statistically equivalent on all demographic and baseline performance variables at pretest (all  $p > .05$ ).

### **Instruments**

Athletic Coping Skills Inventory-28 (ACSI-28; Smith et al., 1995): A 28-item instrument assessing seven psychological skill dimensions coping with adversity, peaking under pressure, goal setting and mental preparation, concentration, freedom from worry, confidence and achievement motivation, and coach ability on a 4-point Likert scale. The instrument demonstrated acceptable internal consistency in the present sample ( $\alpha = .74-.82$ ).

Ottawa Mental Skills Assessment Tool-3 (OMSAT-3; Durand-Bush et al., 2001): A 48-item instrument assessing twelve mental skills across foundation, psychosomatic, and cognitive skill categories on a 7-point Likert scale ( $\alpha = .77-.89$  in the present sample).

Competitive State Anxiety Inventory-2R (CSAI-2R; Cox et al., 2003): A 17-item instrument assessing cognitive anxiety, somatic anxiety, and self-confidence, administered one hour before standardized performance assessments at pre- and posttest.

Sport-specific performance metrics: Standardized performance batteries were developed in consultation with expert coaches for each of the ten sports disciplines, assessing objectively scorable performance indicators (e.g., batting strike rate, service accuracy, and sprint/jump times). Performance was expressed as a percentage of the athlete's maximum established capability to enable cross-sport comparison.

All instruments were translated into Urdu through a forward–backward procedure validated by a bilingual panel of sports psychologists and athletes.

### **PST Intervention Protocol**

The eight-week PST intervention was grounded in Vealey's (2007) tripartite PST model encompassing foundation, performance, and facilitative skills and incorporated PETTLEP imagery guidelines (Holmes & Collins, 2001). Sessions were conducted in Urdu with supplementary regional language materials (Punjabi, Sindhi, Pashto) to maximize accessibility. Each week comprised a two-hour group session (60 minutes didactic and experiential instruction; 60 minutes supervised practice) and structured individual practice assignments. The protocol addressed progressive muscular relaxation (Week 3), PETTLEP-informed imagery (Weeks 4 and 7), cognitive restructuring and self-talk (Week 5), arousal regulation and pre-performance routines (Week 6), and concluding integration of all skills (Week 8). Islamic psychological concepts *tawakkul* (trust in Allah's will), *muraqabah* (mindful awareness), and *niyyah* (purity of intention) were incorporated into the educational rationale for PST techniques to address anticipated cultural and religious concerns. Intervention fidelity was monitored through session logs, facilitator notes, and attendance records. Session attendance in the experimental group averaged 94.3%.

### **Statistical Analysis**

Quantitative data were analyzed using IBM SPSS Statistics Version 27.0 and R (Version 4.3.1). Descriptive statistics, internal consistency coefficients, and assumption-testing procedures (Shapiro Wilk, Levene's test) were computed for all variables. Independent-samples t-tests and Analysis of Covariance (ANCOVA), controlling for pretest scores, were the primary inferential procedures for between-group hypothesis testing. Effect sizes were estimated using Cohen's *d*. Moderation analyses employed the PROCESS macro (Hayes, 2022). The significance threshold was set at  $\alpha = .05$  throughout.

Qualitative interview data were analyzed using Braun and Clarke's (2006) six-phase thematic analysis procedure, supported by NVivo 14 software. Credibility was strengthened through reflexive memoing, peer debriefing, and member checking with eight participant athletes. Mixed-methods integration was achieved through a joint display matrix mapping quantitative findings to qualitative themes.

## **Results**

### **Primary Outcome Variables: Hypothesis Testing**

All five hypotheses were supported. Table 1 presents inferential statistics and effect sizes for each hypothesis test. Following ANCOVA adjustment for pretest scores, the experimental group demonstrated significantly higher posttest scores on all primary outcome variables compared to controls. The magnitude of effects was uniformly large (Cohen's *d* range: 1.01–1.44), indicating practically meaningful, not merely statistically significant, intervention benefits.

**Table. 1.** Hypothesis Testing: ANCOVA-Adjusted Group Comparisons at Posttest

Outcome Variable	Hypothesis	df	T	p-value	Cohen's d
ACSI-28 Total (PST Level)	H1: PST skills improve	418	14.82	< .001	1.44
Sport-Specific Performance (%)	H2: Performance improves	418	10.37	< .001	1.01
CSAI-2R Cognitive Anxiety	H3a: Cog. anxiety reduces	418	12.64	< .001	1.23
CSAI-2R Somatic Anxiety	H3b: Som. anxiety reduces	418	10.91	< .001	1.06
CSAI-2R Self-Confidence	H4: Confidence increases	418	13.28	< .001	1.29
Gender × Group Interaction	H5a: Gender moderates	2, 414	F = 4.72	.009	$\eta^2 = .022$
Sport Type × Group Interaction	H5b: Sport type moderates	9, 408	F = 6.14	< .001	$\eta^2 = .120$

Note. All p-values are two-tailed. Effect sizes:  $d \geq 0.80$  = large. ACSI-28 = Athletic Coping Skills Inventory-28; CSAI-2R = Competitive State Anxiety Inventory-2R.

**Sport-Specific Performance Outcomes**

The experimental group's mean sport-specific performance improved by 18.4% (SD = 4.2%) from pre- to posttest, compared to 2.1% (SD = 1.8%) in the control group. Table 2 presents sport-by-sport performance improvements. The greatest gains were observed in precision-dependent individual sports squash (22.2% net improvement) and badminton (20.4%) while team tactical sports football (12.4%) and volleyball (13.2%) showed more modest but nonetheless substantial improvements.

**Table. 2. Sport-Specific Performance Improvements: Experimental vs. Control Groups**

Sport Discipline	Exp. Group Δ (%)	Ctrl Group Δ (%)	Net Difference (%)	t-statistic	p
Cricket (batting)	20.3	2.4	17.9	8.43	< .001
Football	14.2	1.8	12.4	6.21	< .001
Hockey	15.8	2.2	13.6	6.87	< .001
Squash	24.1	1.9	22.2	10.14	< .001

Sport Discipline	Exp. Group $\Delta$ (%)	Ctrl Group $\Delta$ (%)	Net Difference (%)	t-statistic	p
Badminton	22.7	2.3	20.4	9.81	< .001
Athletics (sprint/jump)	16.4	2.0	14.4	7.23	< .001
Wrestling	17.9	2.1	15.8	7.68	< .001
Swimming	19.2	2.5	16.7	8.12	< .001
Volleyball	15.1	1.9	13.2	6.45	< .001
Basketball	14.8	2.0	12.8	6.32	< .001

Note. Values represent percentage improvements from pretest to posttest. All comparisons significant at  $p < .001$ .

### Moderating Variables

Gender moderation analyses revealed that female athletes demonstrated greater relative gains in mental imagery ( $d = 1.24$  vs.  $d = 0.98$  for males) and self-talk ( $d = 1.19$  vs.  $d = 0.88$ ), while male athletes showed marginally larger gains on goal-setting and concentration subscales. The overall group-by-gender interaction was statistically significant but small in magnitude ( $F(2,414) = 4.72$ ,  $p = .009$ ,  $\eta^2 = .022$ ), indicating that gender moderated but did not substantially alter the broad pattern of PST benefits.

Sport type exerted a more pronounced moderating effect. Individual sport athletes demonstrated larger overall PST skill gains ( $d = 1.61$ ) than team sport athletes ( $d = 1.28$ ), consistent with the greater autonomy individual sport athletes have over pre-performance preparation and the more direct correspondence between psychological state and individual performance outcomes. Competitive experience moderated PST gains in a curvilinear fashion: athletes with three to five years of competitive experience demonstrated the greatest gains ( $d = 1.58$ ), outperforming both novices (0–2 years:  $d = 1.12$ ) and veterans (>5 years:  $d = 1.31$ ) a pattern consistent with an optimal challenge framework in which athletes possess sufficient competitive context to apply newly acquired skills, without having developed rigid habitual coping patterns.

### Qualitative Findings

Thematic analysis of interviews with 30 athletes and 15 coaches generated five superordinate themes that elaborated the mechanisms and conditions underlying quantitative outcomes.

Theme 1 Transformative Self-Awareness: Athletes consistently described a shift from unreflective, reactive psychological engagement toward a more deliberate, monitored stance. A cricket player articulated this transformation: "Before PST, I didn't know what was happening in my head when batting. The pressure just came and I would freeze. Now I can see my thoughts coming, and I can choose what to do with them." This metacognitive development appeared to function as a mediating mechanism linking PST skill acquisition to performance improvement.

Theme 2 Cultural Integration of PST within Islamic Frameworks: The most salient cultural finding concerned athletes' integration of PST within Islamic belief frameworks. Initial concerns about whether mental imagery and self-talk might conflict with Islamic injunctions against hubris or excessive self-reliance were resolved through the intervention's explicit alignment of PST concepts with Islamic psychological principles. A wrestler from Peshawar explained: "I see imagery as preparing my body and mind as a gift from Allah, and then trusting the result to Him it is not arrogance, it's being a good steward." The conceptual parallels drawn between tawakkul and imagery-based preparation appeared to be a critical facilitating factor in the program's high engagement rate.

Theme 3 Institutional Barriers and Enablers: Coach buy-in emerged as the most important institutional determinant of PST adoption, with coaches who actively reinforced PST language and practices in training creating substantially more conducive environments than skeptical counterparts. Resource disparities between well-funded urban universities and under-resourced provincial institutions introduced meaningful inequalities in practice opportunity.

Theme 4 Collective Identity as Performance Context: Athletes consistently described performing for family and community, not merely for individual achievement. This collective motivational orientation occasionally created a sense of cultural discordance with PST's individualistic framing, but also functioned as a powerful motivational amplifier when imagery and self-talk scripts were adapted to incorporate relational and communal motivations.

Theme 5 Gender-Specific Experiential Complexity: Female athletes navigated additional psychological demands including social surveillance, limited same-sex coaching, and family-level skepticism superimposed upon those common to all athletes. Notwithstanding these challenges, female athletes reported particularly strong engagement with imagery and self-talk components, valued as privately accessible tools requiring no institutional infrastructure.

## Discussion

The primary finding of this study that an eight-week, Urdu-delivered, culturally adapted PST intervention produced large improvements in psychological skill levels, competitive anxiety, self-confidence, and objective sport-specific performance among Pakistani university athletes contributes meaningfully to both the cross-cultural PST literature and the applied sport psychology evidence base for South Asian Muslim-majority contexts.

The effect sizes observed here (performance:  $d = 1.01$ ; self-confidence:  $d = 1.29$ ; cognitive anxiety:  $d = 1.23$ ) are consistent with, and in several cases exceed, those reported in PST intervention studies with Western samples. Comparable effects include Calmels et al.'s (2004) imagery program for elite gymnasts ( $d \approx 0.93$ ), Rogerson and Hrycaiko's (2002) centering and self-talk protocol for ice hockey goaltenders ( $d = 1.12$ ), and the weighted mean effect size from Meyers et al.'s (1996) meta-analysis ( $d = 0.62$ ). The relatively larger effects observed in the present study likely reflect the near-complete PST naivety of the sample fewer than 5% of participants had prior formal PST exposure a characteristic associated with steeper initial learning curves and correspondingly larger pre–post gains. These 'PST-naïve' samples represent precisely the population for whom basic psychological skills education delivers maximum marginal benefit.

The differential pattern of gains across sport disciplines with precision-dependent individual sports (squash: 22.2% improvement; badminton: 20.4%) outperforming team tactical sports (football: 12.4%; basketball: 12.8%) replicates an established pattern in the literature (Cumming & Hall, 2002) and may be explained by several mechanisms. Individual sport performance is more directly attributable to personal psychological states, which are less mediated by team coordination dynamics and collective efficacy processes. Individual sport

athletes typically exercise greater autonomy over pre-performance preparation, enabling more consistent PST technique application. The PST protocol's emphasis on pre-performance routines and individualized mental preparation maps more directly onto the self-paced performance structure characteristic of squash and badminton than onto the reactive, externally determined timing structure of football and hockey.

The cultural findings of this study make perhaps the most theoretically significant contribution. Previous calls for culturally sensitive sport psychology practice (Schinke & Hanrahan, 2009) have remained predominantly theoretical; the present study provides concrete empirical evidence of how cultural adaptation specifically, alignment with Islamic psychological concepts functions as a facilitating mechanism rather than a peripheral accommodation. The explicitly integrated tawakkul and muraqabah framework may explain, in part, the program's exceptionally high attendance rate (94.3%), which itself likely contributed to the magnitude of observed gains. These findings extend Si and Lee's (2008) work on PST with Chinese athletes and Haque's (2004) theoretical arguments for Islamic-informed sport psychology, providing the first large-scale empirical evidence base for cultural adaptation of PST in a Muslim-majority athletic context.

The gender moderation findings greater relative female advantage in imagery and self-talk invite careful interpretation. The qualitative data suggest that female Pakistani university athletes value the private, self-contained nature of these techniques in a cultural environment that constrains public psychological expressiveness for women. Imagery and self-talk require no equipment, no institutional space, and no public performance; they are psychologically potent precisely because they are internally executed. This finding has practical implications for PST program design in gender-constrained athletic environments: invisible, portable techniques may be disproportionately valuable for female athletes navigating restrictive sociocultural contexts.

Several study limitations require acknowledgment. The quasi-experimental design, while methodologically appropriate given practical constraints, cannot entirely rule out selection effects or differential attrition influences. The eight-week assessment window, while adequate to detect immediate post-intervention effects, does not address the maintenance of gains or long-term developmental trajectories. The sport-specific performance batteries, though developed in consultation with expert coaches, represent operationalization's of complex sport performance that may not capture all performance dimensions relevant to competitive outcome. Future research employing longitudinal follow-up designs, randomized allocation procedures where feasible, and sport-specific PST protocols (particularly for cricket, given its unique psychological demands) would strengthen confidence in the conclusions drawn here.

### **Conclusion**

This investigation provides the first large-scale, multi-university, multi-sport, gender-inclusive, quasi-experimental evidence for the efficacy of PST in Pakistani university sport. An eight-week, culturally adapted PST intervention produced large, practically meaningful improvements in psychological skill levels, competitive anxiety, self-confidence, and objective sport-specific performance establishing proof of concept for PST implementation in this population and context.

Theoretically, the study extends PST theory beyond its WEIRD-sample origins by demonstrating both the applicability and the cultural specificity of PST processes in a South Asian Muslim-majority context. The critical role of Islamic psychological integration not merely as a tolerability factor but as an active engagement facilitator challenges PST programs designed for Muslim-majority populations to move beyond translation toward genuine conceptual synthesis.

Practically, the eight-week PUAPS Protocol developed and validated in this study provides coaches, administrators, and sport psychologists with a ready-to-deploy, evidence-based intervention tool for Pakistani university athletes. The proposed Pakistan University Athletic Psychological Skills (PUAPS) Framework organizing PST delivery across four interconnected domains: foundation skills, performance skills, cultural support skills and institutional skills offer a replicable model adaptable to other Muslim-majority or South Asian sporting contexts.

### **Practical Implications and Recommendations**

For university sports administrators: Dedicated sports psychology support services beginning with part-time qualified sports psychologist appointments should be established within university sports programs. The PUAPS Protocol should be mandated as a component of preseason preparation across all university sports teams. Gender-sensitive resources and accessible spaces for female athlete psychological support must be prioritized, and PST performance profiling should be integrated into standard athlete evaluation frameworks.

For coaches: Pursuing professional development in sport psychology through HEC and Pakistan Sports Board coaching certification programs will equip coaches to actively reinforce PST skill development in training. Creating mastery-oriented motivational climates emphasizing process goals, improvement trajectories, and effort alongside competitive outcomes is likely to amplify PST effects. Coach buy-in, identified qualitatively as the most influential institutional determinant of PST adoption, should be cultivated through participatory PST training programs in which coaches receive the intervention alongside athletes.

For national sport policy: The Higher Education Commission should include sport psychology service provision as a formal criterion in university sports program quality assurance frameworks. A national university sport psychology resource center tasked with developing, validating, and disseminating Urdu-language PST materials would represent a high-impact investment in athlete welfare and competitive performance. A dedicated research fund for sport psychology and exercise science should prioritize investigations addressing the specific cultural, institutional, and linguistic needs of Pakistani athlete populations. Integration of Islamic psychological principles into PST frameworks warrants formal inclusion in national sport psychology research and practice agendas.

### **References**

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215. <https://doi.org/10.1037/0033-295X.84.2.191>
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman.
- Beilock, S. L., & Carr, T. H. (2001). On the fragility of skilled performance: What governs choking under pressure? *Journal of Experimental Psychology: General*, 130(4), 701–725. <https://doi.org/10.1037/0096-3445.130.4.701>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Calmels, C., Berthoumieux, C., & d'Arripe-Longueville, F. (2004). Effects of an imagery training program on selective attention of national softball players. *The Sport Psychologist*, 18(3), 272–296. <https://doi.org/10.1123/tsp.18.3.272>
- Chaudary, S. (2020). Psychological demands of squash competition among Pakistani university athletes. *Pakistan Journal of Sport Sciences*, 4(2), 14–29.
- Cox, R. H., Martens, M. P., & Russell, W. D. (2003). Measuring anxiety in athletics: The revised Competitive State Anxiety Inventory-2. *Journal of Sport and Exercise Psychology*, 25(4), 519–533. <https://doi.org/10.1123/jsep.25.4.519>

- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage.
- Cumming, J., & Hall, C. (2002). Deliberate imagery practice: The role of imagery in sporting expertise. *Journal of Sports Sciences*, 20(2), 137–145. <https://doi.org/10.1080/026404102317200846>
- Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. [https://doi.org/10.1207/S15327965PLI1104\\_01](https://doi.org/10.1207/S15327965PLI1104_01)
- Driskell, J. E., Copper, C., & Moran, A. (1994). Does mental practice enhance performance? *Journal of Applied Psychology*, 79(4), 481–492. <https://doi.org/10.1037/0021-9010.79.4.481>
- Durand-Bush, N., Salmela, J. H., & Green-Demers, I. (2001). The Ottawa Mental Skills Assessment Tool (OMSAT-3\*). *The Sport Psychologist*, 15(1), 1–19. <https://doi.org/10.1123/tsp.15.1.1>
- Farooq, M. S. (2018). Motivational climate and achievement goals among Pakistani university hockey players. *Pakistan Journal of Physical Education*, 12(2), 45–62.
- Feltz, D. L., & Landers, D. M. (1983). The effects of mental practice on motor skill learning and performance: A meta-analysis. *Journal of Sport Psychology*, 5(1), 25–57. <https://doi.org/10.1123/jsp.5.1.25>
- Greenspan, M. J., & Feltz, D. L. (1989). Psychological interventions with athletes in competitive situations: A review. *The Sport Psychologist*, 3(3), 219–236. <https://doi.org/10.1123/tsp.3.3.219>
- Hall, C. R., Mack, D. E., Paivio, A., & Hausenblas, H. A. (1998). Imagery use by athletes: Development of the Sport Imagery Questionnaire. *International Journal of Sport Psychology*, 29(1), 73–89.
- Hanin, Y. L. (2000). Emotions in sport. *Human Kinetics*.
- Haq, A. (2004). Psychology from Islamic perspective: Contributions of early Muslim scholars and challenges to contemporary Muslim psychologists. *Journal of Religion and Health*, 43(4), 357–377. <https://doi.org/10.1007/s10943-004-4302-z>
- Hardy, L., Jones, G., & Gould, D. (2018). *Understanding psychological preparation for sport: Theory and practice of elite performers*. John Wiley & Sons.
- Hatzigeorgiadis, A., Zourbanos, N., Galanis, E., & Theodorakis, Y. (2011). Self-talk and sports performance: A meta-analysis. *Perspectives on Psychological Science*, 6(4), 348–356. <https://doi.org/10.1177/1745691611413136>
- Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis* (3rd ed.). Guilford Press.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33(2–3), 61–83. <https://doi.org/10.1017/S0140525X0999152X>
- Higher Education Commission. (2022). *HEC Sports Program Annual Report 2021–2022*. HEC Pakistan.
- Holmes, P. S., & Collins, D. J. (2001). The PETTLEP approach to motor imagery: A functional equivalence model for sport psychologists. *Journal of Applied Sport Psychology*, 13(1), 60–83. <https://doi.org/10.1080/10413200109339004>
- Iqbal, M., & Shahzad, M. (2021). Mental toughness and psychological hardiness in Pakistani university athletes. *Journal of Sport and Exercise Psychology in Pakistan*, 1(1), 18–35.
- Jeannerod, M. (1994). The representing brain: Neural correlates of motor intention and imagery. *Behavioral and Brain Sciences*, 17(2), 187–202. <https://doi.org/10.1017/S0140525X00034026>

- Jones, G. (1995). More than just a game: Research developments and issues in competitive anxiety in sport. *British Journal of Psychology*, 86(4), 449–478. <https://doi.org/10.1111/j.2044-8295.1995.tb02565.x>
- Kaufman, K. A., Glass, C. R., & Arnkoff, D. B. (2009). Evaluation of Mindful Sport Performance Enhancement (MSPE): A new approach to promote flow in athletes. *Journal of Clinical Sport Psychology*, 3(4), 334–356. <https://doi.org/10.1123/jcsp.3.4.334>
- Kross, E., Bruehlman-Senecal, E., Park, J., Burson, A., Dougherty, A., Shablack, H., Bremner, R., Moser, J., & Ayduk, O. (2014). Self-talk as a regulatory mechanism: How you do it matters. *Journal of Personality and Social Psychology*, 106(2), 304–324. <https://doi.org/10.1037/a0035173>
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57(9), 705–717. <https://doi.org/10.1037/0003-066X.57.9.705>
- Meyers, A. W., Whelan, J. P., & Murphy, S. M. (1996). Cognitive behavioral strategies in athletic performance enhancement. *Progress in Behavior Modification*, 30, 137–164.
- Moran, A. (2004). *Sport and exercise psychology: A critical introduction*. Routledge.
- Ntoumanis, N., Ng, J. Y., Prestwich, A., Quested, E., Hancox, J. E., Thøgersen-Ntoumani, C., & Williams, G. C. (2021). A meta-analysis of self-determination theory-informed intervention studies in the health domain. *Health Psychology Review*, 15(2), 214–244. <https://doi.org/10.1080/17437199.2020.1718529>
- Rogerson, L. J., & Hrycaiko, D. W. (2002). Enhancing competitive performance of ice hockey goaltenders using centering and self-talk. *Journal of Applied Sport Psychology*, 14(1), 14–26. <https://doi.org/10.1080/10413200209339008>
- Schinke, R. J., & Hanrahan, S. J. (Eds.). (2009). *Cultural sport psychology*. Human Kinetics.
- Shahzad, M., & Naeem, M. (2011). Competitive anxiety and coping strategies among provincial Pakistani cricketers. *Pakistan Journal of Psychology*, 42(1), 51–72.
- Si, G., & Lee, H. C. (2008). Sport psychology in an Asian context. In D. Hackfort & G. Tenenbaum (Eds.), *Essential processes for attaining peak performance* (pp. 282–305). Meyer & Meyer.
- Smith, R. E., Schutz, R. W., Smoll, F. L., & Ptacek, J. T. (1995). Development and validation of a multidimensional measure of sport-specific psychological skills: The Athletic Coping Skills Inventory-28. *Journal of Sport and Exercise Psychology*, 17(4), 379–398. <https://doi.org/10.1123/jsep.17.4.379>
- Vealey, R. S. (2007). Mental skills training in sport. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of sport psychology* (3rd ed., pp. 287–309). John Wiley & Sons.
- Weinberg, R. S., & Gould, D. (2023). *Foundations of sport and exercise psychology* (8th ed.). Human Kinetics.
- Williams, J. M., & Krane, V. (2021). *Applied sport psychology: Personal growth to peak performance* (8th ed.). McGraw-Hill.