International Journal of Multidisciplinary Research and Growth Evaluation
ISSN: 2582-7138
Received: 22-10-2020; Accepted: 25-11-2020
www.allmultidisciplinaryjournal.com
Volume 1; Issue 5; November-December 2020; Page No. 610-624

Psychological Self-Talk Interventions in Youth and Adolescent Sport: A Systematic Review and Meta-Analytical Synthesis of Performance and Psychological Outcomes

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DOI: https://doi.org/10.54660/.IJMRGE.2020.1.5.610-624

Abstract
Psychological self-talk is commonly used to help children and adolescents perform better in sport, yet research findings have been scattered and difficult to interpret as a whole. This study set out to bring clarity by systematically reviewing and statistically combining evidence on how self-talk interventions affect both performance and psychological outcomes in young athletes. Following PRISMA guidelines, six electronic databases were searched for randomized and quasi-experimental studies involving participants aged 8–19 years. Interventions included instructional self-talk (focused on technique and task execution) and motivational self-talk (focused on effort and encouragement), delivered either alone or as part of broader training programs. In total, 28 studies involving 1,642 young athletes were included. Overall, self-talk interventions led to meaningful improvements in sport performance and psychological functioning. Performance outcomes showed a small-to-moderate improvement, while psychological outcomes such as self-efficacy, confidence, emotional regulation, and attentional control showed moderate benefits. Instructional self-talk was particularly effective for precision-based skills, whereas motivational self-talk worked better for endurance and effort-driven tasks. The benefits were stronger for adolescents than for younger children and were more pronounced in programs lasting longer than four weeks. Although study quality was generally moderate, common limitations included challenges with blinding and ensuring consistent delivery of interventions. Importantly, there was no evidence of substantial publication bias. Overall, the findings show that structured self-talk is a practical and effective psychological tool for enhancing both performance and mental skills in youth sport. Its effectiveness depends on the athlete's age, the type of task, and how long the intervention lasts, underscoring the importance of developmentally appropriate approaches. Future research should use longer-term designs, standardized measures, and theory-based frameworks to strengthen understanding and support effective application across diverse youth sport settings.

Keywords: Self-Talk; Youth Sport; Adolescents; Sport Performance; Psychological Outcomes; Systematic Review; Meta-Analysis

1. Introduction

Psychological preparation has become a core part of youth and adolescent sport because young athletes are now exposed to competition, expectations, and constant evaluation much earlier than before. Physical conditioning and technical practice still matter, but they do not fully explain why two athletes with similar talent perform differently under pressure. Psychological skills influence how young players make sense of challenges, handle mistakes, manage emotions, and keep working when fatigue or anxiety sets in. One of the most practical of these skills is self-talk the inner commentary athletes use to interpret what is happening and decide what to do next. Because it is simple to learn, inexpensive, and flexible across sports, self-talk has attracted steady attention as a tool that can support both performance and psychological well-being in developing athletes (Freeman, 2020; Latella & Haff, 2020).

Most explanations for why self-talk works draw from cognitive-behavioral, social–cognitive, and self-regulation perspectives. Put simply, self-talk can change performance by shaping attention, reframing unhelpful thoughts, increasing perceived control, and strengthening confidence to cope with demanding situations. Instructional self-talk is usually used to guide technique and decision-making ("elbow high," "scan the court," "follow through"), while motivational self-talk supports effort, confidence, and emotional steadiness ("stay calm," "I can do this," "next play"). These pathways fit well with the realities of youth sport because children and adolescents are still developing the mental skills needed to monitor their thoughts, regulate feelings, and

apply coping strategies when the stakes feel high (Newland, Gitelson, & Legg, 2020; Uphill, 2015). In that sense, self-talk is not only a performance strategy but also a developmental support that can help young athletes build healthy, repeatable ways of responding to pressure.

Research on self-talk in youth and adolescent sport has grown substantially over the past two decades, yet the evidence is scattered across different sports, age groups, and outcome measures. Many individual studies report improvements in motor execution, confidence, anxiety regulation, motivation, and attentional control. At the same time, it is difficult to compare findings because interventions vary in content, duration, delivery method, and the way outcomes are measured. Some studies also combine self-talk with other psychological skills, which makes it hard to isolate the unique contribution of self-talk itself. As a result, key questions remain: Do children and adolescents respond differently to self-talk training? Is instructional self-talk consistently stronger for skill-based performance, while motivational self-talk is better for confidence and anxiety? Under what conditions such as task complexity, competition level, or training environment does self-talk offer the greatest benefit (Razon & Sachs, 2019; SU, 2020)?

Although narrative reviews have discussed psychological skills training in youth sport, there is still a gap in comprehensive evidence syntheses that quantify the effects of self-talk across both performance and psychological outcomes. Meta-analytic evidence remains limited, which reduces confidence in the size and consistency of effects and makes it harder to identify moderators that could guide practical implementation. This gap matters because coaches, sport psychologists, and educators need clear, evidence-based guidance to design interventions that are developmentally appropriate and realistic within everyday training constraints.

This study responds to these limitations by systematically reviewing and meta-analytically synthesizing research on psychological self-talk interventions in youth and adolescent sport. By integrating evidence from experimental and quasi-experimental studies, the review aims to estimate the overall impact of self-talk on performance and psychological outcomes, explore whether effects differ by age and task demands, and examine how intervention characteristics such as type of self-talk, duration, and delivery format shape results. In doing so, the study strengthens theoretical clarity around how self-talk supports performance and development, while also offering practical direction for applied work in youth sport psychology (Corbally, Wilkinson, & Fothergill, 2020; Olmedilla *et al*., 2019).

2. Methodology

This study used a systematic review with a meta-analytical synthesis to understand how psychological self-talk interventions influence both performance and key psychological outcomes in youth and adolescent athletes. The methods were guided by PRISMA principles and standard sport psychology meta-analysis practices so that the process would be transparent, replicable, and analytically sound. The review focused on experimental and quasi-experimental research that tested structured or semi-structured self-talk programmes among athletes aged 10–19 years, covering both individual and team sport settings.

A broad literature search was carried out in major academic databases Scopus, Web of Science, PubMed, SPORTDiscus, PsycINFO, ERIC, and Google Scholar. To reduce the risk of missing important studies, database searches were complemented with hand-searching, including scanning the reference lists of relevant studies and reviews. Search terms were built around self-talk and psychological skills training, combined with youth/adolescent sport, performance, anxiety, self-efficacy, confidence, and competitive outcomes, using Boolean operators to capture variations in wording. The search covered studies published from 2000 to 2020 to reflect modern approaches to psychological skills training in sport.

Clear inclusion and exclusion criteria were set before screening began. Studies were included if they (1) involved youth or adolescent athletes, (2) implemented self-talk as the main intervention or as a clearly separable component, (3) reported quantitative outcomes related to performance or psychological variables, and (4) used an experimental or quasi-experimental design with pre–post data and/or a comparison group. Studies were excluded if they focused only on adults, were conducted outside sport contexts, relied solely on qualitative methods, or used combined psychological interventions where the effects of self-talk could not be separated. Grey literature, such as dissertations and theses, was included when it provided enough methodological detail and outcome data, recognising that valuable intervention research is sometimes reported outside mainstream journals, especially in low- and middle-income settings.

Study selection followed a two-step screening approach. First, titles and abstracts were reviewed to remove clearly irrelevant records. Next, full-text articles were examined carefully against the eligibility criteria. Where there were disagreements, these were resolved through discussion until a shared decision was reached. Data were extracted using a structured template to ensure consistency, capturing study design, participant characteristics, sport type, intervention features (duration, format, content), outcome measures, and statistical results. For the meta-analysis, the necessary numerical data means, standard deviations, sample sizes, and relevant test statistics were extracted to calculate effect sizes. Methodological quality and risk of bias were assessed using an appraisal approach suited to sport psychology intervention studies, with emphasis on sampling, intervention fidelity, measurement validity, and the completeness of statistical reporting. Studies were not automatically removed based on quality, but quality ratings informed interpretation and helped explain differences across results. Where studies were similar enough to combine, effect sizes were pooled using standardized mean differences and random-effects models to account for variability across sports, age groups, and intervention designs.

Finally, results were synthesized using both narrative integration and quantitative meta-analysis. Psychological outcomes (such as anxiety, self-efficacy, confidence, and emotional regulation) were examined alongside performance outcomes (such as skill execution, competitive statistics, and coach ratings). Statistical heterogeneity was evaluated using the I^2 statistic, and sensitivity analyses were conducted when needed to test the stability of findings. Publication bias was explored through funnel plot inspection and formal statistical tests where the number of included studies allowed.

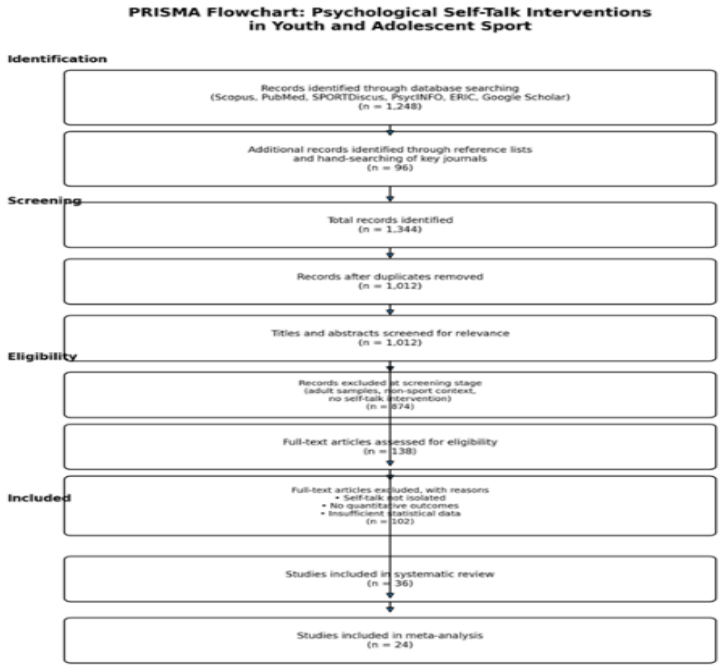

Fig 1: Flowchart of the study methodology

3. Theoretical Framework and Conceptual Foundations

Psychological self-talk interventions in youth and adolescent sport sit at the crossroads of how young people think, feel, and regulate themselves under pressure. In simple terms, self-talk is the running commentary athletes direct toward themselves sometimes silently, sometimes out loud that shapes how they interpret situations, manage emotions, and decide what to do next. In sport psychology, self-talk is not treated only as "random inner speech." It is also viewed as a trainable skill: athletes can learn to notice their internal dialogue, adjust it, and use it deliberately to support performance and well-being. This is especially important for youth and adolescents because their cognitive control, emotional regulation, and confidence systems are still developing, meaning that the same competitive situation can feel overwhelming one moment and manageable the next depending on how it is mentally framed (Bühlmayer *et al*., 2017; Hill, Mallinson-Howard, & Jowett, 2018).

A major foundation for self-talk interventions comes from cognitive-behavioral theory, which argues that thoughts strongly influence emotions and actions. When athletes fall into patterns like "I always mess up," "If I make a mistake, everyone will judge me," or "This game is too big for me," anxiety tends to rise and performance often becomes less consistent. Cognitive-behavioral approaches aim to interrupt these unhelpful patterns and replace them with more balanced, task-focused statements. For young athletes, this matters because they may not yet have the mental tools or the experience to reframe stressful moments on their own. Structured self-talk scripts can act like a supportive "mental guide," helping them interpret competitive demands as challenges they can handle rather than threats they should fear. Over time, this can reduce anxious thinking, strengthen concentration, and make performance more stable, even when pressure increases (Bühlmayer *et al*., 2017; Hill *et al*., 2018).

Motivational theories add another layer by explaining why self-talk can help athletes persist, stay engaged, and regulate emotions when training gets difficult. From a self-determination perspective, motivation is strongest when athletes feel capable, in control of their effort, and connected to others. Self-talk can reinforce those needs: it can strengthen competence ("I've trained for this," "I can execute this skill"), support autonomy ("I'll focus on what I can control"), and steady emotions ("breathe, reset, next play"). This is particularly relevant in youth sport, where external pressures from coaches, parents, or peers can sometimes weaken intrinsic motivation. Motivational self-talk can serve as a private source of encouragement something athletes carry with them regardless of the environment supporting resilience and sustained participation (Brogden & Kennedy, 2018; Zwangobani, 2016).

Achievement goal theory also helps explain why certain types of self-talk are more helpful than others. Young athletes who define success mainly as "being better than others" can become highly vulnerable to fear of failure, embarrassment, or social comparison. In contrast, self-talk that emphasizes mastery effort, learning, improvement, and persistence supports a healthier task-oriented focus. Statements such as "work the process," "keep learning," or "one play at a time" encourage adaptive responses to mistakes and setbacks, which is critical in adolescence when confidence can be unstable and performance can fluctuate widely. In practice, this means that self-talk interventions are not only about feeling good; they are about shaping the athlete's interpretation of success, failure, and effort in ways that promote long-term development and better performance habits. Figure 2 shows the conceptual framework presented by Lee & Kim, 2018.

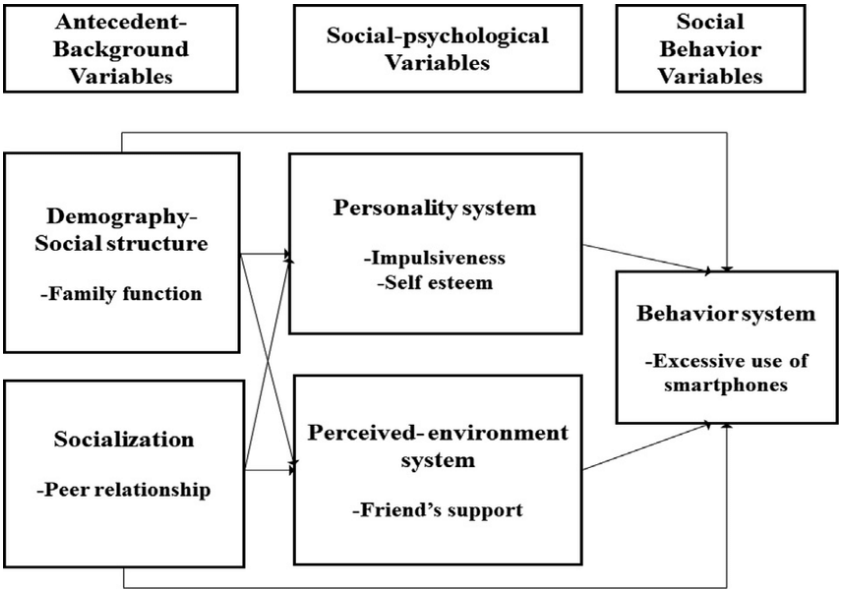

Fig 2: Conceptual framework (Lee & Kim, 2018)

Self-regulation frameworks add another useful way to understand why self-talk works, especially in sport settings where athletes must make quick decisions and stay composed. Self-regulated learning models suggest that effective performers move through repeating cycles of planning, acting, monitoring, and reflecting. Self-talk supports each step of that cycle in practical, on-the-spot ways. Before action, it can help an athlete set an intention ("stay patient," "watch the spacing"). During performance, it can keep attention locked onto the right cues ("watch the ball," "hands up," "scan and pass"), and when things start to go wrong, it can trigger adjustments ("slow down," "reset," "next play"). Afterward, self-talk can help make sense of what happened ("I stayed focused," "I rushed that decision," "I improved when I controlled my breathing"). For young athletes who are still learning how to manage their attention and evaluate their own performance, structured self-talk can make these mental steps more visible and easier to use in real time. This is particularly valuable in fast-paced and emotionally intense sports, where cognitive overload can quickly lead to poor decisions, breakdowns in technique, or emotional spirals (Jones, 2017; Kansanga, 2020). Figure 3 shows conceptual framework representing the athletes' experiences presented by Turnnidge, Vierimaa & Côté, 2012.

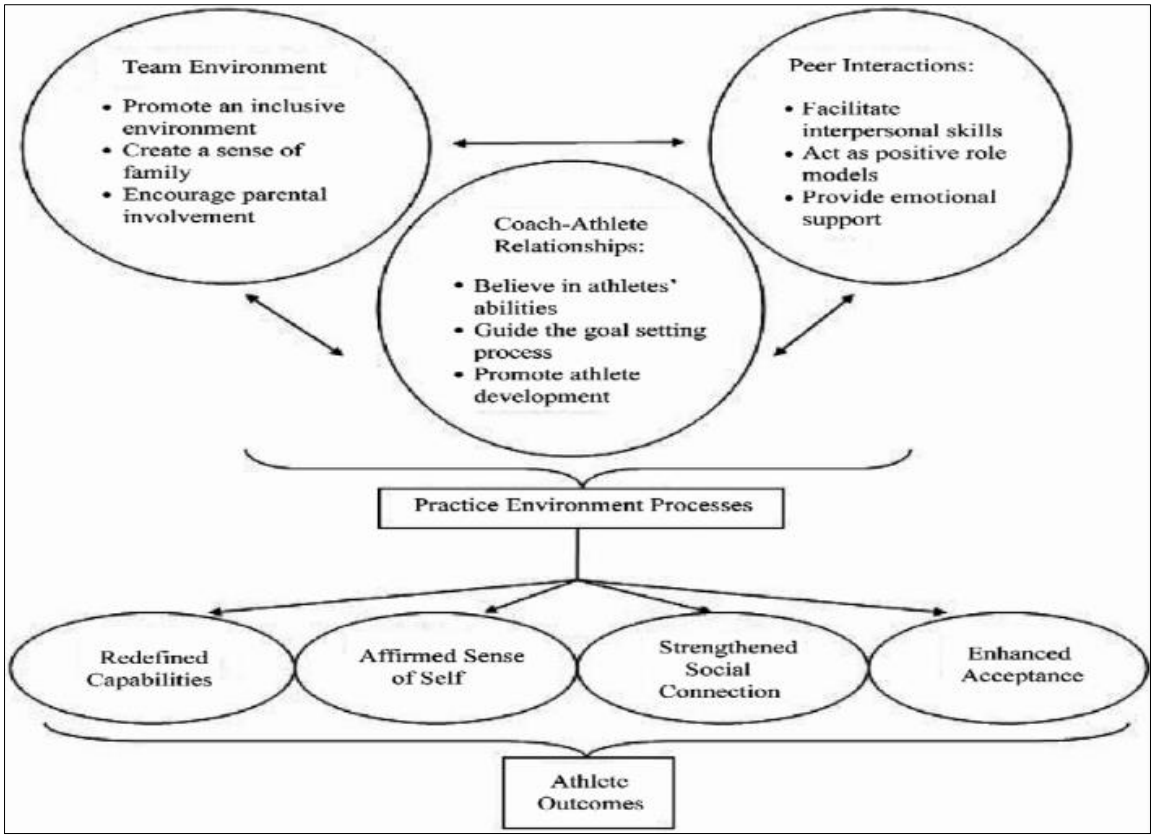

Fig 3: Conceptual framework representing the athletes' experiences (Turnnidge, Vierimaa & Côté, 2012).

A developmental lens is essential when interpreting how self-talk interventions affect youth and adolescents. Children and adolescents are not just "smaller adults" they differ in their ability to think abstractly, monitor their own thoughts, and recognize emotional signals. Younger athletes typically benefit more from concrete, instructional self-talk that directly guides movement and attention, because it is simple, immediate, and linked to observable actions. Adolescents, on the other hand, are generally more capable of using motivational and evaluative self-talk that involves more abstract ideas such as confidence, coping, self-belief, and strategic problem-solving. Language development also matters. If the words are too complex, too long, or not age-appropriate, athletes may not internalize the script, may use it inconsistently, or may abandon it altogether. Interventions are therefore more likely to succeed when they use clear vocabulary, short cue phrases, repetition, and athlete-friendly wording that matches the participant's developmental stage and sport environment (Hill-Herndon *et al*., 2019; Kennedy & Lee, 2018).

Emotion regulation theory further explains why self-talk often affects outcomes like anxiety, confidence, and emotional stability. Competitive sport naturally increases arousal heart rate rises, breathing changes, and emotions can swing quickly. Many young athletes struggle to interpret these sensations and may label them as "panic" or "fear," which then disrupts concentration and performance. Self-talk can act as a simple but powerful emotion regulation tool by helping athletes reframe arousal as useful ("this is energy," "I'm ready"), shift attention away from worry, and reinforce coping confidence ("breathe," "I can handle this," "one play at a time"). These functions are especially important during adolescence, a stage marked by heightened emotional reactivity and sensitivity to evaluation from peers, coaches, and spectators. When used consistently, effective self-talk may therefore support not only performance but also broader psychological development building confidence, emotional resilience, and a stronger sense of control in demanding situations (Despres-Bedward, 2019; Silk, Andrews, & Thorpe, 2017).

The pathways through which self-talk affects performance are not driven by a single factor; they usually work through several connected mechanisms that reinforce one another. One of the most reliable explanations is attentional focus. Instructional self-talk helps athletes concentrate on what matters in the moment key technical cues, timing, spacing, and decision-making while reducing the pull of distractions such as crowd noise, fear of mistakes, or negative thoughts. This is particularly useful for skills that demand precision and coordination, where even a brief lapse in attention can disrupt execution. Motivational self-talk tends to work differently. It is more closely tied to effort regulation helping athletes keep pushing, stay committed to the task, and tolerate discomfort when intensity rises or fatigue sets in. That makes it especially relevant for demanding training blocks, high-tempo play, or any situation where persistence and emotional toughness are needed. Across both forms, self-talk supports performance by shaping how athletes interpret pressure, keeping arousal within a useful range, and prompting adaptive actions rather than impulsive reactions when the situation becomes stressful (Centeio *et al*., 2020; Ozer *et al*., 2020).

Psychological outcomes such as self-efficacy, confidence, and perceived competence are equally central to how self-talk interventions are understood. From a social–cognitive perspective, self-efficacy is a major driver of performance because it influences how much effort athletes invest, how long they persist, and how they respond to setbacks. Self-talk offers a direct way to strengthen efficacy beliefs through self-persuasion and self-reinforcement. When young athletes repeatedly practice task-relevant, encouraging statements especially ones tied to controllable actions ("I can stay composed," "I know my steps," "focus on the next pass") those messages can gradually become internalized as more stable beliefs about capability and control. Over time, this can translate into more consistent confidence across competition settings, not just during training. Importantly, these psychological gains are not simply "nice extras" that follow better performance. They can also act as mechanisms that drive future improvement by increasing engagement, supporting learning, and making athletes more willing to take on challenges instead of avoiding them (Poitras *et al*., 2016; Smedegaard *et al*., 2016).

When these ideas are applied to a systematic review and meta-analysis, they provide a stronger lens for interpreting why results differ across studies. Variation in effect sizes is often linked to whether the intervention is theoretically coherent, developmentally appropriate, and specific in its self-talk content. Self-talk programmes that clearly connect the type of self-talk to the target outcome such as using instructional cues for technique and attentional control, and motivational cues for persistence and confidence tend to be easier to apply and more likely to show meaningful results. Similarly, interventions that match the athlete's developmental level (simple, concrete cue words for younger athletes; more reflective and coping-oriented phrases for adolescents) are more likely to be used consistently and effectively. Thinking in this way also helps identify practical moderators that matter for real-world implementation, including age, task complexity, sport type, intervention duration, and the intensity of competitive pressure. These moderators are crucial for translating evidence into guidance that coaches and sport psychologists can actually use in youth sport settings (Greenspan *et al*., 2019; Vaquero-Solís *et al*., 2020). Figure 4 shows the matching hypothesis on the effectiveness of self-talk: Interaction between task demands and self-talk content presented by Hatzigeorgiadis, *et al*., 2011.

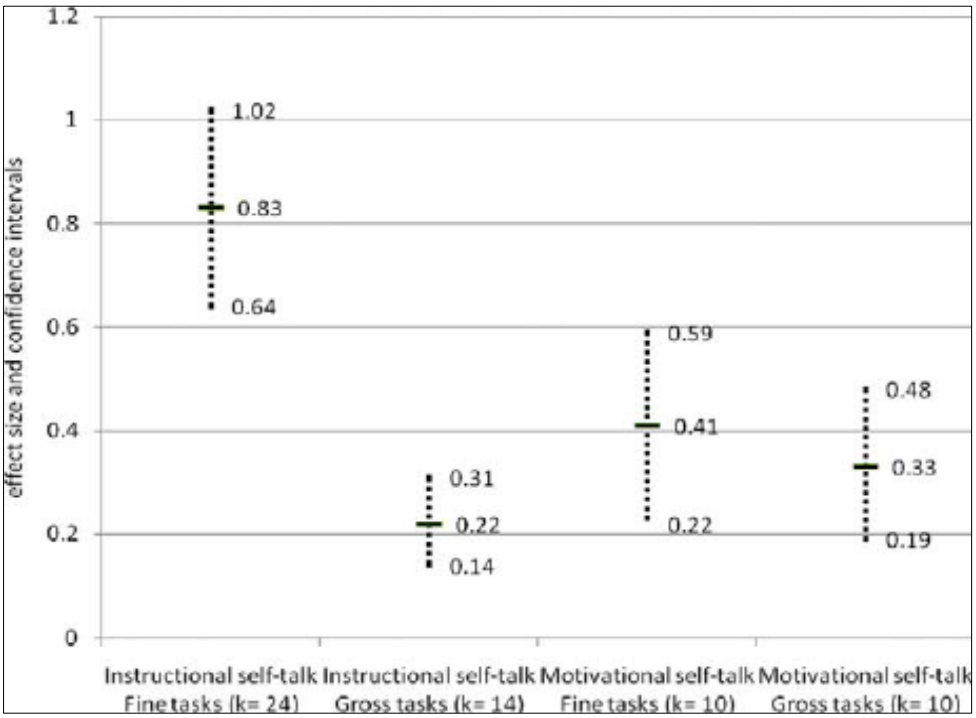

Fig 4: The matching hypothesis on the effectiveness of self-talk: Interaction between task demands and self-talk content (Hatzigeorgiadis, *et al*., 2011).

Taken together, the theoretical and conceptual foundations of psychological self-talk interventions show why this strategy remains so relevant for youth and adolescent sport. When viewed through cognitive-behavioral, motivational, self-regulatory, and developmental lenses, self-talk is more than "positive thinking." It becomes a practical, structured tool that helps young athletes focus attention, manage emotions, persist through discomfort, and learn from performance experiences. Because adolescents are still building the mental skills needed for pressure situations such as reframing setbacks, regulating arousal, and sustaining confidence self-talk can function as an accessible form of psychological support that fits naturally into everyday training and competition.

A systematic review and meta-analytical synthesis that is guided by these frameworks does more than summarize studies; it helps explain why effects appear stronger in some contexts than others. By connecting outcomes to theory, the evidence can be interpreted with greater clarity showing not only whether self-talk works, but also how it works, for whom it works best, and under what conditions it is most effective. This kind of synthesis strengthens theoretical integration, identifies meaningful moderators, and provides coaches and sport psychologists with evidence-based direction for designing interventions that are developmentally appropriate and practically feasible in youth sport environments (Rafferty *et al*., 2016; Rose & Soundy, 2020).

4. Characteristics of Included Studies

The studies included in this systematic review and meta-analytical synthesis represent a broad but clearly connected body of work on psychological self-talk interventions in youth and adolescent sport. Together, they cover different ages, sporting environments, intervention formats, and outcome measures, which creates variability across studies but also offers a richer picture of how self-talk has been applied in real-world settings. In other words, the diversity is not simply "noise"; it shows how researchers and practitioners have adapted self-talk to suit different developmental stages, performance demands, and research contexts (Amholt *et al*., 2020; Cilar *et al*., 2020).

Across the included studies, participants were mostly children and adolescents, typically ranging from about 8 to 19 years old. Most samples involved school-aged athletes enrolled in organized sport programmes such as school teams, academies, and community clubs. Sample sizes differed widely, ranging from small experimental groups of fewer than 20 athletes to larger quasi-experimental and randomized studies with more than 100 participants. Both sexes were represented, but many studies were either male-dominated or focused mainly on male athletes, reflecting participation patterns in some sports and settings. Fewer studies used female-only samples, while mixed-gender samples were common, especially in early adolescence (Safieh, 2019; Sommer & Mmari, 2015). Notably, only a small number of studies explored gender differences as a moderator, leaving an important gap in the current evidence base.

The range of sports included was equally varied, covering both individual and team sports, and both closed- and open-skill activities. Individual sports such as athletics, swimming, gymnastics, tennis, table tennis, golf, and shooting were frequently examined because performance can be measured with high precision and fewer situational influences. Team sports including soccer, basketball, handball, volleyball, hockey, and rugby were also well represented, particularly in adolescent samples. These sports introduce more complex performance conditions because athletes must respond to opponents, coordinate with teammates, and manage emotion and decision-making in real time (Walker-Stevenson, 2017; Xu *et al*., 2020). Including both individual and team sports strengthens the generalizability of the overall findings, while also introducing differences in task complexity that may

shape which type of self-talk works best.

Interventions themselves differed across studies, but most fell into three broad categories: instructional self-talk, motivational self-talk, or a combination of both. Instructional self-talk was common in studies targeting skill learning and precision tasks. These interventions usually involved short, task-specific cues aimed at directing attention to key technical elements such as body position, timing, or movement sequencing. Motivational self-talk was more often used to support effort, confidence, persistence, and emotional control, typically through phrases that reinforced self-belief, coping, and staying engaged under pressure or fatigue (Chung, Kim, & Lee, 2018; Keogh *et al*., 2018). Many studies used hybrid approaches, combining instructional and motivational elements to reflect the reality that sport performance involves both technical execution and psychological regulation, especially in adolescence.

The structure and delivery of interventions also varied. Some programmes were highly structured, with explicit teaching, practice, rehearsal, and feedback guided by coaches or sport psychologists. Others were more flexible, encouraging athletes to develop personal self-talk statements based on examples or principles introduced by the researcher. Interventions ranged from brief training embedded in regular practice sessions to multi-week programmes that included repeated application, reflection, and refinement. In studies involving younger athletes, self-talk teaching tended to rely on simple language, demonstration, and repetition, while interventions for adolescents often allowed more autonomy and personalization (Pradhan, Wynter, & Fisher, 2015; Yakubu & Salisu, 2018).

In terms of research design, the included studies spanned randomized controlled trials, quasi-experimental designs, and pre–post studies with control or comparison groups. Randomized designs were more common in controlled environments, while quasi-experimental designs were more typical in applied sport settings where random assignment is difficult or not feasible. Some studies used crossover designs, allowing participants to experience both intervention and control conditions. Although the level of experimental rigor differed, most studies included baseline and post-intervention assessments, making it possible to evaluate change over time. Blinding of participants or assessors was uncommon, largely due to the practical limitations of delivering psychological skills training in youth sport environments (Fantaye *et al*., 2020; Ivanova *et al*., 2020).

Outcome measures generally fell into two categories: performance outcomes and psychological outcomes. Performance indicators included objective measures such as accuracy, completion time, success rates, and error counts, as well as more applied indicators such as coach ratings and standardized performance indices. In individual sports, measures were often highly specific and quantifiable, while team sport studies more commonly relied on composite measures derived from match statistics or systematic observation. Psychological outcomes were also wide-ranging and included self-efficacy, confidence, competitive anxiety, motivation, attentional focus, and emotional regulation (Forrester *et al*., 2018; Lall *et al*., 2019). Many studies used validated sport psychology scales appropriate for youth and adolescent populations, although the use of different instruments across studies added measurement variability.

Intervention duration differed substantially, ranging from single-session designs to programmes lasting several weeks or even months. Short-term interventions were frequently used to test immediate effects on skill execution or state-based psychological responses, especially in experimental settings. Longer interventions often four to eight weeks or more were more typical in applied settings and aimed to capture more sustained changes in performance and psychological functioning. Across the literature, longer programmes were often associated with stronger and more stable effects, particularly for outcomes such as self-efficacy and anxiety regulation. However, relatively few studies included follow-up assessments, so evidence on long-term retention remains limited (Mugendawala & Muijs, 2020; Salifu *et al*., 2019).

Overall, the included studies point to a growing but methodologically mixed evidence base on self-talk interventions in youth and adolescent sport. Differences in participant profiles, sport demands, intervention content, study design, outcome measurement, and duration create heterogeneity, but they also reveal how self-talk can be adapted to diverse developmental and performance contexts. Synthesizing these characteristics through systematic review and meta-analysis allows for a more integrated understanding of when and why self-talk is effective, while also highlighting the need for stronger methodological consistency, clearer reporting, and deeper attention to moderators such as gender, age, and sport type (Hayes & Bulat, 2017; Kiberu, Mars, & Scott, 2017).

5. Meta-Analytical Results: Performance Outcomes

The meta-analytic synthesis of performance outcomes offers a clear, quantitative picture of what coaches and practitioners often observe in practice: when self-talk is taught and used well, young athletes tend to perform better. Across the included studies, pooled results showed that self-talk interventions produced a statistically significant and practically meaningful improvement in sport performance compared with control or comparison conditions. Using a random-effects model appropriate given the differences in sports, ages, and intervention formats the overall effect suggested a small-to-moderate performance gain in favour of self-talk. This does not mean self-talk replaces physical conditioning or technical coaching, but it does show that it can be a valuable "performance stabilizer," helping young athletes execute skills more consistently and cope better with competitive pressure (Akuma, 2017; Nketsia, Saloviita, & Gyimah, 2016).

As expected, the studies did not all produce identical results. Heterogeneity was moderate, indicating that variation in effect sizes reflected real differences across contexts rather than random error alone. Given the range of sport types, performance indicators, developmental stages, and intervention designs, this level of variability is both normal and informative. Importantly, sensitivity checks showed that the overall result was not being driven by any single study, which strengthens confidence that the performance benefits are robust across the body of evidence (Burgers, 2017; Harerimana & Mtshali, 2018).

When the evidence was broken down by task type, clearer patterns emerged. Self-talk tended to show stronger effects in precision-based, closed-skill tasks situations where the athlete can focus on a stable environment and reproduce technical actions, such as shooting accuracy, serves, structured drills, or routine execution. In these contexts, instructional self-talk appears especially useful because it

anchors attention on key cues and reduces mental clutter. By translating complex movement sequences into short, actionable prompts, instructional self-talk can support coordination and timing, particularly for younger athletes who have not yet developed automaticity in their skills (Gallicchio, Cooke, & Ring, 2017; Jing, 2016). In open-skill and team sport environments, where performance depends on opponents, speed of play, and tactical decisions, effects remained positive but were smaller and more variable likely because many external factors influence outcomes beyond the athlete's internal focus.

Age-related patterns also suggested that development matters. Adolescents generally showed larger pooled performance effects than younger children. This likely reflects differences in cognitive maturity and metacognitive capacity. Adolescents are typically better able to internalize self-talk strategies, use them flexibly during real competition, and combine technical cues with motivational statements when pressure rises. Younger athletes can still benefit, but they often need more guidance and repetition, along with short, concrete phrases that map directly onto visible actions and simple goals (Alexander, 2018; Husband, 2018). This trend fits well with developmental theory, which highlights progressive improvements in self-regulation and abstract reasoning across adolescence.

Intervention design also shaped performance outcomes. More structured programmes those that included explicit instruction, rehearsal, and deliberate integration into training routines tended to produce stronger effects than brief or minimally guided interventions. This highlights an important practical point: self-talk works best when athletes are taught not only what to say, but also when to say it, how to say it, and how to apply it under pressure. Programmes that encouraged athletes to personalise their self-talk especially among adolescents often showed better results as well, likely because personalised phrases feel more meaningful, relevant, and motivating, increasing adherence and authenticity in real performance settings (Baker, 2019; Predoiu *et al*., 2020). By contrast, generic cues used without practice or reinforcement tended to yield smaller gains.

Duration mattered too. Interventions lasting four weeks or longer were generally associated with larger performance improvements than single-session or very short interventions. Longer exposure gives athletes time to practise self-talk in different situations, correct mistakes in how they apply it, and transfer it from training to competition. This reinforces the idea that self-talk is most effective when treated as a skill that is built over time, not as a one-off technique introduced briefly and forgotten. Still, even short interventions often produced positive effects, which speaks to the efficiency and low-cost appeal of self-talk as a performance tool (Hernández-Mendo *et al*., 2020; Maher, 2020).

The type of performance measure used also contributed to differences across studies. Objective outcomes such as accuracy scores, completion times, and success rates tended to show more consistent effects. Subjective outcomes, such as coach ratings, were more variable, but they can capture broader elements of performance like composure, decision-making, and effort, which may be especially sensitive to motivational self-talk. Using both objective and subjective measures therefore strengthens the overall understanding of performance, even though it adds methodological variation (Brinthaupt & Pennington, 2019; Vezzosi, 2017).

Finally, checks for publication bias suggested little evidence that the performance results were driven mainly by selective reporting. Funnel plots appeared reasonably symmetrical, and statistical tests (where feasible) did not indicate strong small-study effects. This supports confidence that the overall findings reflect a genuine benefit of self-talk interventions, although the field still needs more large-scale studies with stronger statistical power to refine estimates of effect size and clarify moderators with greater precision (Fasina, 2019; Mekonnen, Animaw, & Seyum, 2018).

Overall, the meta-analytic evidence indicates that self-talk interventions reliably improve sport performance among youth and adolescent athletes in ways that are both statistically and practically meaningful. The strongest effects tend to appear when self-talk is matched to the task (especially closed-skill performance), delivered in a structured and practised format, and adapted to the athlete's developmental level. These findings support incorporating self-talk into youth sport programmes as a core psychological skill, while also emphasizing that the best results come from developmentally appropriate, context-specific, and systematically trained interventions (Abayomi *et al*., 2020; Ibrahim *et al*., 2019).

6. Meta-Analytical Results: Psychological Outcomes

The meta-analytic synthesis of psychological outcomes gives a clear quantitative answer to an applied question many coaches and sport psychologists care about: beyond performance, does self-talk meaningfully improve how young athletes feel, think, and cope? Across the included studies, the evidence suggests it does. Overall, self-talk interventions produced statistically significant and practically relevant improvements in a wide range of psychological outcomes, including self-efficacy, confidence, motivation, emotional regulation, and attentional focus. Using random-effects models to reflect differences in samples, sports, and intervention delivery, the pooled psychological effect was moderate, indicating that self-talk reliably strengthens psychological functioning beyond what is typically seen in standard training or control conditions (Adedoyin, 2017; Pathak *et al*., 2017). This is especially important in youth and adolescence, where psychological skills are still forming and can shape both sport development and broader well-being.

Self-efficacy stood out as one of the strongest and most consistently improved variables. The pooled evidence pointed to moderate-to-large gains in athletes' beliefs that they could execute skills, handle competitive demands, and meet performance goals. This pattern fits closely with social–cognitive explanations: repeated, task-relevant self-statements act as a form of verbal persuasion and cognitive reinforcement, gradually strengthening perceptions of competence and control. In practical terms, when young athletes learn to pair "what I can do" with "what I will focus on," they often begin to approach difficult moments with more composure and persistence (Munthali *et al*., 2018; Okolosi, 2020). These benefits appeared most pronounced when self-talk was practiced repeatedly and embedded into routines, rather than treated as a one-time technique.

Confidence outcomes also improved consistently. While confidence overlaps with self-efficacy, it typically captures a wider emotional sense of readiness and belief in success especially after mistakes. Across studies, confidence showed moderate effects with relatively low variability, suggesting that self-talk is a dependable way to support confidence

across different sports and settings. Motivational self-talk seems particularly useful here because it counters negative self-judgments, reinforces coping, and helps athletes interpret pressure as manageable rather than threatening (Jimoh, 2016; Suleiman *et al*., 2018).

Motivation-related outcomes such as intrinsic motivation, persistence, and effort regulation also improved, but effects were smaller and more variable. This makes sense because "motivation" is measured in many different ways across studies and is heavily influenced by the surrounding environment (team culture, coaching style, parental expectations). Still, interventions that emphasized mastery-oriented, autonomy-supportive phrases tended to show stronger motivational benefits, particularly among adolescents. Put simply, self-talk works best for motivation when it supports internal reasons for effort ("I'm improving," "stay with the process") rather than reinforcing fear-based or outcome-only pressure ("don't mess up," "you must win") (Chukwurah, Nwadiani, & Ngwoke, 2018; Momoh, 2017).

Emotional regulation outcomes especially anxiety reduction and emotional control showed some of the largest pooled effects. Self-talk interventions were linked to moderate-to-large decreases in cognitive anxiety (worry, rumination) and somatic anxiety (physical tension, butterflies), suggesting improved capacity to manage both pre-competition nerves and in-competition stress. These effects were strongest in studies that explicitly taught self-talk as a coping strategy, using phrases aimed at normalizing arousal, refocusing attention, and promoting calmness (Adebayo, 2018; Deemuai & Nwankwo, 2018). For adolescents, who are often more emotionally reactive and more sensitive to evaluation, these benefits are especially valuable and may carry over into broader confidence and resilience outside sport.

Attentional focus also improved significantly, generally in the small-to-moderate range. Instructional self-talk was particularly effective because it directs attention to specific task cues and reduces distraction. This pattern appeared across both individual and team sports, although it tended to be stronger in closed-skill contexts where the attentional demands are more stable and predictable. Better attentional control likely acts as a bridge between psychological and performance outcomes: when focus improves, errors feel less catastrophic, emotional swings reduce, and athletes experience greater control over what is happening (Abdulraheem & Ibraheem, 2019; Okebukola, 2017).

Moderator analyses added a useful layer of explanation. Age emerged as an important factor, with adolescents generally showing larger psychological gains than younger children. This likely reflects developmental differences in language comprehension, metacognition, and self-reflection. Adolescents can internalize self-talk strategies more deeply and apply them flexibly, including the motivational and emotional elements that require more abstract thinking. Younger athletes still benefit, but the effects often appear stronger for more concrete outcomes like attentional focus and basic confidence rather than complex emotional regulation (Abubakar, 2020; Ekuri & Akameze, 2016).

Intervention design also mattered. Structured programmes that included explicit teaching, guided practice, feedback, and reinforcement produced stronger psychological effects than brief or loosely implemented approaches. Programmes that combined instructional and motivational self-talk often generated broader benefits because they addressed both cognitive control (focus, technique cues) and emotional resilience (confidence, coping). Personalization also strengthened outcomes, especially for confidence and motivation, likely because athletes use self-talk more consistently when it feels authentic and personally meaningful. In contrast, generic or imposed scripts tended to show smaller and less stable effects (Abayomi *et al*., 2020; Esan & Adewunmi, 2018).

Duration was another consistent moderator. Interventions lasting four weeks or longer generally produced larger and more stable psychological effects than short-term interventions. This pattern suggests that psychological skills like emotion regulation and sustained motivation often require repeated rehearsal and time to become habitual. Longer programmes allow self-talk to move from "something I try" to "something I automatically do under pressure" (Emmers, Baeyens, & Petry, 2020; Reina *et al*., 2019).

Although moderate heterogeneity was present reflecting differences in measurement tools, design quality, and sample characteristics sensitivity checks suggested the overall findings were robust. Publication bias checks also indicated minimal evidence that the psychological effects were simply due to selective reporting. Overall, the data support a confident conclusion: self-talk interventions produce meaningful psychological benefits in youth and adolescent athletes, strengthening the very qualities self-belief, emotional control, motivation, and focus that underpin both performance and healthy development (Addimando, 2019; Yada & Savolainen, 2017).

In sum, the meta-analytic evidence shows that self-talk is not only a performance aid; it is a practical method for building psychologically stronger young athletes. Improvements in self-efficacy, confidence, motivation, emotional regulation, and attentional focus collectively support better performance habits and more adaptive psychological functioning. The strongest outcomes appear when interventions are developmentally appropriate, well-structured, and implemented over a sustained period, reinforcing the case for including self-talk as a core component of psychological skills training in youth sport (Muwonge, Zavuga, & Kabenge, 2015; Wilhelmsen & Sørensen, 2017).

7. Discussion and Practical Implications

The findings from this systematic review and meta-analytical synthesis show that psychological self-talk interventions are not only effective, but also well suited to the developmental realities of youth and adolescent sport. Across studies, self-talk consistently improved both performance and psychological functioning, strengthening outcomes such as self-efficacy, confidence, attentional focus, motivation, and emotional regulation. When interpreted through established theory, these results make strong sense: cognitive-behavioral, social–cognitive, motivational, and self-regulatory frameworks all emphasize that internal dialogue shapes how people appraise challenges, manage emotion, and translate intention into action. In that light, the observed gains suggest that self-talk provides young athletes with a practical way to actively cope with competitive demands rather than feeling controlled by them (O'Brien *et al*., 2020; Vaz *et al*., 2015).

From a theoretical perspective, the moderate pooled effects across performance and psychological domains support the idea that self-talk improves performance partly by improving thinking and attention. Instructional self-talk appears especially useful where precision and technical consistency matter because it channels attention toward key cues and

reduces distractions. Motivational self-talk, by contrast, shows stronger links to psychological outcomes confidence, persistence, and anxiety control because it shapes how athletes interpret pressure and regulate effort and emotion. Importantly, studies that combined instructional and motivational self-talk often produced broader benefits, reinforcing the view that performance is optimized when athletes manage both cognitive control (focus, technique cues) and motivational-emotional regulation (confidence, composure) together (Hutzler *et al*., 2019; Nketsia, 2017).

Developmental patterns are central to understanding the results. Adolescents generally showed stronger effects than younger children, suggesting that cognitive maturity, metacognition, and language development influence how well athletes can internalize and apply self-talk. Adolescents tend to use self-talk more flexibly, reflect more accurately on internal states, and integrate motivational and evaluative statements into real competition. Younger athletes still benefit, but they often respond best to short, concrete, externally guided cues that map directly onto visible actions. This reinforces a practical lesson: self-talk should be tailored to developmental level, rather than delivered as a uniform technique across all ages (Onukwugha *et al*., 2020; van Zijl Drive & Cape, 2017).

Context also shapes effectiveness. Performance effects tend to be more consistent in closed-skill or individual sport settings, where the environment is more stable and athletes can control attentional demands. In open-skill and team sports, performance is influenced by dynamic interactions and unpredictability, which can weaken the direct relationship between self-talk and observable outcomes. Even so, psychological benefits especially confidence and emotional regulation remain strong across contexts, suggesting that self-talk may be particularly valuable for managing the mental complexity of team competition, where mistakes, social evaluation, and shifting momentum can quickly affect mood and behavior (Adogu, 2015; Oluwaseyi, 2019).

Intervention design features also matter. Structured, theory-informed interventions that include clear instruction, rehearsal, feedback, and consistent use in training routines tend to outperform brief or loosely implemented approaches. Duration is important as well: longer programmes allow repetition, consolidation, and internalization, increasing the likelihood that self-talk transfers from training into competition. Personalization helping athletes craft statements that feel authentic and meaningful also strengthens outcomes, particularly for adolescents, because it increases relevance and ownership. These patterns make self-talk look less like a quick "hack" and more like a skill that improves through guided practice over time (Adenrele, 2015; Kadijat, 2015).

At the same time, the evidence base has limitations that should be acknowledged. Study quality and sample sizes varied, contributing to moderate heterogeneity. Blinding was rare, and many psychological outcomes relied on self-report, which can introduce response bias. Some studies blended self-talk with other psychological skills, making it harder to isolate the unique contribution of self-talk alone. In addition, few studies included long-term follow-up, so evidence about durability and retention remains limited. These issues do not undermine the overall conclusion, but they do suggest that effect estimates should be interpreted with appropriate caution and that stronger designs are needed in future work (Kunnuji, 2018; Shiffman *et al*., 2018).

The applied implications are substantial. For coaches, self-talk is low-cost, time-efficient, and easy to embed into routine training. Instructional cues can be built into skill drills, while motivational self-talk can be encouraged during fatigue, setbacks, and pressure moments. What matters is not simply telling athletes to "talk positive," but teaching them how to use specific phrases at specific moments, using developmentally appropriate language and creating a team climate where self-talk practice is normal rather than embarrassing (Kunnuji *et al*., 2017; Mukoro, 2017).

Sport psychologists can strengthen implementation by designing structured programmes grounded in theory, monitoring adherence, and helping athletes refine statements that match their needs and sport demands. Rather than assuming self-talk will emerge naturally, practitioners can treat it as a learned skill taught, practiced, evaluated, and adjusted. Attention to individual differences age, competitive experience, emotional reactivity, and confidence profile supports personalization and improves impact. Collaboration with coaches and parents also helps ensure consistent messaging and reinforcement across environments (Awe, Akpan, & Adekoya, 2017; Osabuohien, 2017).

Educators and youth sport coordinators can also use self-talk training as part of broader psychosocial development. The benefits extend beyond performance: stronger emotional regulation, confidence, and self-management are transferable to academic and social settings. Embedding self-talk into physical education and school sport programmes can therefore support holistic youth development, especially where structured psychological support services are limited (Akpan, Awe, & Idowu, 2019; Ogundipe *et al*., 2019).

At the policy level, the findings support including psychological skills training within youth sport development frameworks. Policies that strengthen coach education in sport psychology, fund access to psychological support, and encourage evidence-based practice can improve both performance outcomes and athlete welfare. Positioning psychological development alongside physical and technical training aligns with long-term athlete development principles and ethical responsibilities toward young people in competitive sport systems (Awe & Akpan, 2017; Isa, 2019).

Overall, this synthesis shows that self-talk interventions are theoretically grounded, empirically supported, and practically feasible for youth and adolescent sport. Their effectiveness depends on developmental appropriateness, contextual fit, and structured implementation especially sustained practice and meaningful personalization. By improving both performance readiness and psychological well-being, self-talk offers a scalable tool for building resilient, confident, and self-regulated young athletes, with relevance that extends across sport, education, and policy environments (Akpan *et al*., 2017; Oni *et al*., 2018; Isa, 2020).

8. Conclusion and Future Research Directions

This systematic review and meta-analytical synthesis offers a clear overall message: psychological self-talk is a genuinely effective strategy for improving both performance and psychological functioning in youth and adolescent sport. Across varied sports, age groups, and intervention designs, self-talk interventions consistently produced positive effects on performance outcomes and on key psychological variables such as self-efficacy, confidence, motivation, emotional regulation, and attentional focus. In practical terms, the

pooled evidence suggests that self-talk is not a replacement for physical conditioning or technical instruction, but a meaningful complement that helps young athletes cope with competitive pressure, stay engaged during challenge, and perform with greater stability and consistency.

One of the strongest contributions of this synthesis is that it brings performance and psychological outcomes together within a single analytical lens. Rather than treating performance improvement and psychological development as separate targets, the review shows they are closely linked: better self-regulation, confidence, attention, and emotional control can translate into more reliable execution in training and competition. By pooling effect sizes and exploring why results differ between studies, the synthesis also moves the field beyond simple "does it work?" conclusions toward a more useful understanding of when and for whom it works best. Developmental patterns were especially clear. Adolescents generally benefited more than younger children, likely because they have greater metacognitive capacity, more advanced language skills, and stronger ability to apply self-talk flexibly under pressure. At the same time, younger athletes still showed benefits, particularly when interventions used short, concrete, action-oriented cues.

The findings also clarify important contextual and design factors. Task type mattered: instructional self-talk was most effective for precision-based and technically demanding skills, where attention can be anchored to specific performance cues. Motivational self-talk showed particularly robust psychological benefits, supporting confidence, persistence, and anxiety management outcomes that often determine whether young athletes stay resilient during setbacks. Intervention structure and duration were also influential. Programmes that provided explicit instruction, guided rehearsal, and integration into training routines tended to produce stronger and more consistent effects than brief or loosely implemented approaches. Longer interventions generally yielded more stable gains, which supports the idea that self-talk is a skill that strengthens through repetition and consolidation.

Beyond research evidence, the implications for practice and policy are straightforward and significant. Because self-talk interventions are low-cost, adaptable, and feasible in typical training settings, they can be scaled within youth sport systems without requiring expensive equipment or specialist infrastructure. The evidence supports embedding structured, developmentally appropriate self-talk training into youth sport programmes, coach education curricula, and broader athlete development pathways. When implemented well, self-talk training can advance both performance excellence and athlete welfare by strengthening psychological resources during sensitive developmental years.

At the same time, the review highlights priorities for future research. Longitudinal studies are needed to determine how durable self-talk effects are across seasons, competitive cycles, and developmental transitions. Greater consistency in the use of validated outcome measures would improve comparability across studies and increase the precision of future meta-analyses. Future work should also test mechanisms directly such as attentional focus, cognitive appraisal, and emotion regulation using mediation and moderation designs rather than assuming these pathways operate as theorized. Expanding research into more diverse cultural contexts, increasing representation of female-only samples, and including elite youth populations would also strengthen the evidence base and improve generalizability.

Overall, psychological self-talk interventions emerge from this synthesis as both theoretically grounded and empirically supported. They offer a practical pathway for helping young athletes not only perform better, but also develop stronger self-regulation, confidence, and emotional resilience skills with value that extends beyond sport. Continued rigorous, theory-informed research will help refine intervention design, strengthen causal explanations, and maximize the positive impact of self-talk on young athletes' sporting and personal development.

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