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ABSTRACT

Self-talk is a psychological skill training that improves motor performance and sports skills among athletes. Previous research has indicated differences between motivational self-talk and instructional self-talk in sports performance. However, there is a lack of attention paid to the effectiveness of self-talk toward psychological barriers. Therefore, the primary aim of this study was to examine past studies on the effect of self-talk on sports performance and to select psychological variables among athletes. Through a systematic review, we analysed the scientific production concerning the sports psychology of self-talk toward athletes. The process review was conducted by the PRISMA protocol and a search performed by using online data sources (Scopus, Web of Science, and Semantic Scholar), as well as, conference proceedings of possibly related papers. The search was limited to articles published within ten years and written in English. A total of 38 studies were analysed. Referring to a total of 38 studies (nine articles focused on the self-talk questionnaire, six articles on motivational self-talk, six articles on instructional studies, and 17 articles focused on both motivational self-talk). Based on this, only 9 studies satisfied the eligibility criteria related to sports performance and psychological effects. As a result, a sample of 9 studies was subjected to systematic quality analysis. The analysis results showed that negative self-talk decreases athletes' performance. In addition, there is inconsistent evidence on the effect of motivational and instructional self-talk based on specific sports. Based on this review, instructional self-talk is beneficial for fine skills (free-throw basketball and penalty shoot-out), and motivational self-talk is effective for gross skill (running). Thus, it can be concluded that both motivational and instructional self-talk play an important role in enhancing motor performance.

Keywords: *Psychological skill training, Motivational self-Talk, Instructional skill training, Sport Performance, Psychological variables*

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INTRODUCTION

Self-talk refers to verbalization or statements addressed to the self (Amar & Chéour 2014). Self-talk is important in all types of sports. Self-talk affects behavior and strategies involved in mental processes (Boroujeni & Shahbazi, 2011). Self-talk is one of the most common cognitive strategies employed by athletes (Boroujeni & Shahbazi, 2011). It refers to overt or covert self-verbalizations that appear to assist in both instructional and motivational functions (Hardy et al., 2004). There are four types of self-talk: positive instructional self-talk, positive motivational self-talk, negative self-talk, and neutral self-talk. Motivational self-talk is defined as a statement made to facilitate performance by increasing self-confidence and energy expenditure, expanding effort, and evoking a positive mood, while instructional self-talk assists performance by initiating desired movements through the focus of attention on tactical and technical aspects of motor skills (Boroujeni & Ghaheri, 2011). According to Bobic (2013), negative self-talk is the thought of having doubts in oneself, which creates a debilitating feeling when attempting to accomplish a task, whereas neutral self-talk is somewhat uncommon among athletes in team or individual sports since it is important for athletes to keep their mind on relevant cues during the game. The research examined the impact of self-talk on sport performance has focused on comparing the effects of positive and negative self-talk as well as comparing the effects of instructional and motivational self-talk (Goudas, M., Hatzidimitriou, V., & Kikidi, M., (2006). The use of self-instructional strategies has also succeeded during the last two decades in the field of sports psychology, which have been described as self-talk interventions and involved with self-talk cues aimed at facilitating learning and enhancing performance through the stimulation of appropriate responses (Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, Y. (2011).

METHODS

To appropriately conduct the systematic review of relevant literature, the criteria recommended by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement ("Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P) 2015: Elaboration and Explanation," 2016) were used.

Search strategy:

This study carried out the comprehensive survey of the online data source (Scopus, Web of Science, and Semantic Scholar) as well as conference proceedings of possibly related papers. To search for relevant articles, the following terms related to self-talk were used as the primary descriptions. These were combined with instructional, motivational, and sports performance. The search articles were restricted to studies published in English with complete test accessibility.

Data collection process:

This study focused on published articles and studies, and researchers used a systematic methodology that analysed the collected data to evaluate the effect of self-talk on psychological variables and sport performance. Studies or theses that focus on other psychological skills training, such as imagery and breathing techniques, have been removed because this study

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focuses more on self-talk training. The inclusion criterion was related to the effect of self-talk on sports performance. In addition, the effects on psychological factors, such as anxiety, were also included. By applying this criterion, we excluded studies that did not investigate both psychological variables and sport performance. In addition, conference abstracts and book chapters that were not available in the full text of the thesis were excluded.

Data extraction process:

For this study, data selection was performed by a single researcher. The extracted data were related to the study's nation and location, sample size, sport performance, psychological variables, refurbishment dates, and assessment tools. The extraction started with the titles of the articles, followed by the analysis of the selected abstracts and full-text articles. To facilitate analysis and discussion, the following data were extracted from the publications: authors, publication year, number of participants, participants, study design, outcome, conclusion, inclusion reason, publication year, publication type, language, and study design.

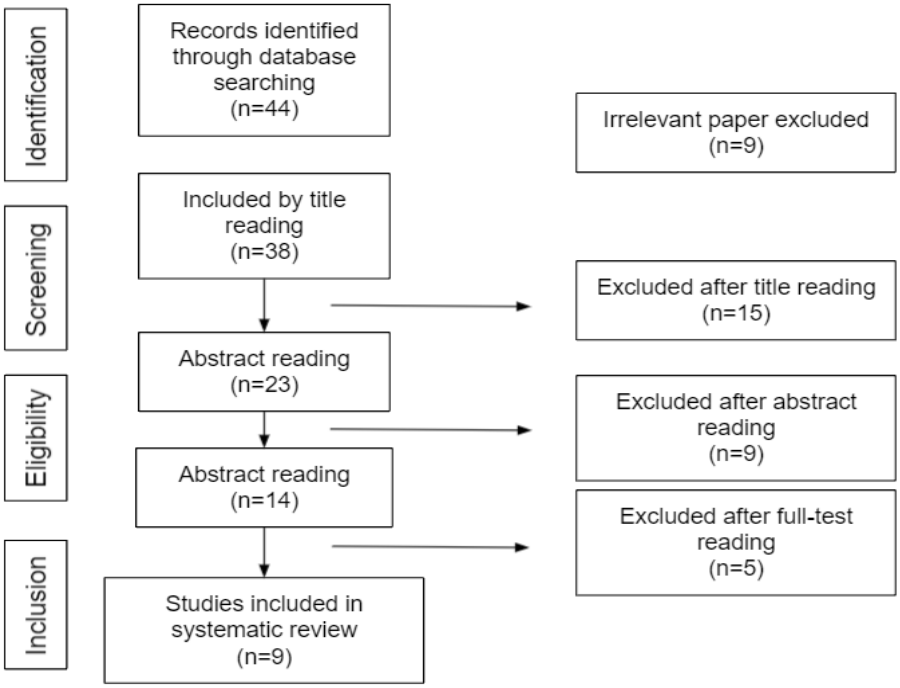

Figure 1. PRISMA flow diagram of the study selection process

RESULTS

A total of 38 studies were recorded from 44 records, and only a few studies were accepted for review, of which 9 were selected. The selected studies are presented in Table 1, including the author(s), publication year, number of participants, participants, study design, outcome, conclusion, inclusion reason, publication year, publication type, language, and study design.

Malaysian Journal of Sport Science and Recreation
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Table 1. Demographics of the included studies.

NO.	AUTHORS, PUB YEAR	NUMBER OF PARTICIPANTS, PARTICIPANTS	STUDY DESIGN	OUTCOME/ CONCLUSION	INCLUSION REASON(S), PUB YEAR, PUB TYPE, LANGUAGE, STUDY DESIGN
1.	Andrea Bobic 2013 Relationship among the types and use of self-talk, free throw percentage, and anxiety of collegiate basketball players	26 participants (26 females, 0 males) Collegiate basketball players	The survey included questions regarding positive instructional and motivational self-talk, negative self-talk, anxiety, and close game situations. The self-talk portion of the survey was obtained from the Self-Talk Use Questionnaire (STUQ; Hardy, Hall, & Hardy, 2004; 2005)	Mean self-talk scores revealed "medium" use of self-talk in both settings, while mean anxiety scores shifted from a "low" anxiety level in competition to a "medium" anxiety level in close games. Correlations revealed the percentage of positive self-talk used by participants was positively correlated with free throw percentage during competition and negatively correlated with anxiety during competition and close games, but were not significant. The percentage of negative self-talk was negatively correlated with free throw percentage during competition and positively correlated with anxiety during competition and close games, although only one correlation was significant. These findings suggest that there are benefits for collegiate basketball players using different types of self-talk during sport performance. The relationship among these variables have identified that the use of self-talk is related to an increase in free throw performance and a decrease in anxiety among the participants.	2013, research journal, English, effect of self-talk and sport performance
2.	Mohd Saufi Bin Dali* and Vincent A. Parnabas	Forty-eight (48) male novice basketball players (22.27 ±	The experimental design and field-testing Anxiety were measured by using State-Trait Anxiety	state and trait anxiety level of post-intervention was significantly lower than pre-intervention in all groups. The results of free throw performance showed the instructional self-talk intervention group	2018, research journal, English, effect of self-talk and sport performance

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	2018 The effects of self-talk on free throw performance and the level of anxiety among male novice basketball players	1.47 years)	Inventory for Adults (STAI) basketball free throw by using a standard ball (No. 6). The accuracy of the free throws was scored within a range of 1-5 points	was significantly improved from pre-intervention to post-intervention followed by the combination of instructional and motivational self-talk intervention group, motivational self-talk intervention group and control group. No significant differences in anxiety level and free throw performance among all groups. Therefore, it is recommended that self-talk can be used to enhance the free throw performance and reduce the anxiety's level for the novice athletes.	
3.	Dave VJ Marshall and Stephanie J. Hanrahan 2016 The Effects of Self-Talk Cues on the Putting Performance of Golfers Susceptible to Detrimental Putting Performances Under High Pressure Settings	Amateur golfers (n = 7) ranged in age from 51 to 81 years (M = 59.14) with 10-35 years of experience (M = 20.17) and handicaps ranged from 5 to 27 (M = 17).	Participants consisted of 3 groups (control, motivational ST, and instructional ST) and completed a 10 session ST intervention involving stimulated putting. Competitive State Anxiety Inventory (CSAI-2) was used to measure the state anxiety level for pre and post intervention.	Improvement in the putting performance was reported with a significant difference between groups in the instructional ST group, followed by the motivational ST group, then the control group. Anxiety scores were found to have no significant reduction between sessions.	2016, article, English, self-talk and sports performance.
4.	Lukas Linnér 2010 The effects of	9 elite golf players with a mean age of 20.4 years (SD = ±	A repeated measure design was implemented, and the	Results found that there were no significant effects of self-talk (instructional; 52.03, SD = ± 11.63 and motivational; 53.25, SD = ± 7.99) on self-efficacy.	2010, research journal, English, effect of self-talk on

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	instructional and motivational self-talk on self-efficacy and performance in golf players.	1.1).	putting experiment was completed in three sessions.	In term of performance, result revealed a significant difference (F2, 14 = 8.599, p<.01, partial eta2=.55) between experimental stages which the instructional self-talk significantly improved the performance (M =34.69, SD = ± 17.89) compared to the baseline measure (M = 87.31, SD = ± 25.63).	sports performance.
5.	Gholamreza Lotfi,, Farshid Tahmasebi1 and Aziz Rabav 2016 The impact of instructional and motivational self-talk on cognitive anxiety, somatic anxiety, and learning of soccer shot skill in beginner players	60 non-athlete male students (mean age= 14.9 ± 0.78 years old)	Quasi-experimental applied field study. Divided into four groups of 15 participants: Instructional self-talk, positive motivational self-talk, negative motivational self-talk, and control. The anxiety level measured through Marten's State - Competitive Anxiety Inventory, and the shooting performance measured by Moore-Christian shooting skill test at different stages. The exercise was performed 6 sessions every other day and 24 attempts were conducted in each session.	The mean of cognitive anxiety post-test and somatic anxiety post-test in the positive motivational self-talk group was significantly better than the negative self-talk group; however, there was no significant difference in other groups. The shoot accuracy performance in positive motivational self-talk group and instructional group in post-test was better than negative self-talk group	2016, research journal, English, effect of self-talk and sport performance
6.	Tayebeh Baniasadi,	40 students were randomly selected	The subjects rehearsed the phrase I Can in	The subjects preferred instructional self-talk over motivational self-talk in dart throwing tasks.	2013, research journal, English,

Malaysian Journal of Sport Science and Recreation
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	Mir Hamid Salehian, Amir Giami Rad, Lamia Mirheidari 2013 Players' Perception of the Effect and Superiority of Self-Talk in Motor Performance	as the participants. The subjects ranged in age from 19 to 24 years.	motivational self-talk condition across both dart throwing and dynamic balance tasks whereas they used the phrases Center-Goal and Bend Your Knees for dart throwing and dynamic balance tasks as the instructional self-talk phrases, respectively, before they performed the tasks	However, they were found to prefer motivational self-talk in dynamic balance tasks.	effect of self-talk and sport performance
7.	Yu-Kai Chang, Li-An Ho, Frank Jing-Horng Lu, Ching-Chieh Ou, Tai-Feng Song, Diane L. Gill 2014 Self-talk and softball performance: The role of self-talk nature, motor task characteristics,	An experimental, within-subjects, and counterbalanced design. Forty-two senior high students (mean age ¼ 17.48 0.55)	Instructed to use instructional, motivational, and unrelated self-talk with counterbalanced order prior to softball throwing for accuracy and distance tasks	Both instructional and motivational self-talk conditions had better performance than unrelated self-talk on softball throwing accuracy, whereas motivational self-talk had better performance than both instructional and unrelated self-talk in softball throwing for distance. Results for self-efficacy were similar, with self-efficacy for accuracy performance higher in both instructional and motivational self-talk conditions than with unrelated self-talk, while self-efficacy was highest in the motivational self-talk condition and lowest with unrelated self-talk. Significant correlations between self-efficacy and motor performance were also found with both task	2014, research journal, English, effect of self-talk and sport performance

	and self-efficacy in novice softball players				
8.	Zetou E, Vernadakis N, Bebetsos E, Makraki E 2012 The effect of self-talk in learning the volleyball service skill and self-efficacy improvement	57 female players 13 years old (mean age =12.83, SD=0.97) with two years' experience (M=1.99, SD=0.67)	Assigned into two groups: the instructional self-talk group and the control (traditional) group. followed a four-week practice program, aiming at overhand service skill learning and self-efficacy improvement. The program consisted of two practice units (60 min) per week.	Participants of the ISTG had better scores in the final measurement than the control group, when technique was evaluated and improved also their self-efficacy. In conclusion the Self-talk helps female volleyball athletes to improve performance and learning of overhand service skill and to improve also their self-efficacy	2012, research journal, English, effect of self-talk and sport performance
9	Yusup Hidayat & Didin Budiman 2014 The Influence of Self-Talk on Learning	64 beginning badminton athletes aged between 10-12 year (mean=10.8), consisting of 32 boys and 32 girls	Divided into three experimental groups and one control group by random assignment. Before getting the treatment, all participants did a	Self-talk has a significant influence on badminton, clear lob learning achievement and self-confidence. Combination of instructional self-talk and motivational self-talk significantly enhances badminton clear lob learning achievement and self-confidence than instructions and motivational self-talk only. Instructional self-talk significantly	2014, research journal, English, effect of self-talk and sport performance

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Achievement and Self Confidence	from badminton schools in Bandung, Indonesia	badminton clear lob test, then all experimental groups were given the following self-talk treatment (instructional, motivational, and combination of them), and badminton clear lob instructions	enhances badminton clear lob learning achievement than motivational self-talk. Motivational self-talk significantly enhance self-confidence than instructional self-talk

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DISCUSSION

The aim of this study is to provide a comprehensive overview of instructional and motivational self-talk on psychological and sport performance. Self-talk helps athletes overcome psychological problems while performing their tasks. Several researchers have suggested that self-talk can increase athletes' task performance and reduce psychological problems. In addition, previous researchers believe that self-talk has a significant influence on the performance of single motor tasks and can overcome psychological problems in the future. Self-talk may also help overcome the impact of negative thoughts in the future.

The finding of the study by Dali and A. Parnabas, (2018), stated the instructional self-talk improved from pre-intervention to post intervention followed by the combination of the instructional and motivational self-talk. Based on a systematic review that has been studied, the effect of instructional self-talk on a single motor task was supported by (Marshall et al. (2016), Tayebeh et al. (2013) and Chang et al. (2014). According to Marshall et al. (2016), the instructional self-talk group reported an improvement in putting performance followed by motivational self-talk. This is similar to the results of a previous study by Tayebeh et al. (2013), who stated that participants prefer using instructional self-talk for dart-throwing tasks compared to motivational self-talk. Based on Hidayat and Budiman's (2014) study of badminton sports, the results show that instructional self-talk enhances badminton clear lob compared to motivational self-talk. This shows that instructional self-talk is beneficial for single-motor tasks.

Tayebeh et al. (2013) stated that motivational self-talk increases dynamic balance tasks compared to instructional self-talk. This shows that motivational self-talk is useful in tasks related to gross skills. This result has been supported by Chang et al. (2014), who stated that motivational self-talk had a better performance on the softball throwing task in terms of distance compared to instructional and unrelated self-talk interventions.

The study of psychological variables showed that motivational self-talk can be more effective in reducing psychological problems than instructional self-talk. This is supported by a previous study by Chang et al. (2014), who stated that motivational self-talk increases self-efficacy more than unrelated self-talk does. The results are similar to those of Hidayat and Budiman (2014), who reported that motivational self-talk enhances the self-confidence of participants compared to instructional self-talk. In addition, there are studies that show that similar effects on instructional self-talk and motivational self-talk enhance motor tasks compared to other unrelated sports. This has been reported by Chang et al. (2014), who stated that both instructional and motivational self-talk increase the performance of softball throwing accuracy compared to other unrelated self-talk interventions.

CONCLUSION

Based on the results of the present study, it can be concluded that the self-talk intervention, which was an instructional and motivational self-talk, affected athletes' sports performance and psychological perspective. According to the results of the present study and previous studies, it can be assumed that instructional self-talk helps to enhance the tasks involving attentional focus and requires a high skill of technique, while motivational self-talk enhances the skill that

requires power and less concentration. Unrelated self-talk, such as negative self-talk, can be concluded as negative psychological training and must be avoided.

Conflict of Interest

There are no conflicts of interest involved for this project and paper publications.

Author's Contribution

Authors contributed equally to the design, idea and research strategy of this article. The writing part lead by Saufi Dali, and Ahmad Fikri Mohd Kassim for guidance on this project specifically on the coordination and helped the draft the outlined of the manuscript. Mohad Anizu Mohd Nor supervised the project and proofread in the sequence and alignment. All authors read and approved the final manuscript.

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