Exploring the Influence of Achievement Goals on Exercise Motivation: A Systematic Review

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Abstract

Recent scholarly work has emphasized the significance of achievement goals in influencing exercise motivation, yet their impact in this context remains insufficiently explored. This review systematically investigates the effects of achievement goals on diverse facets of exercise motivation, encompassing performance, achievement, and engagement. Adhering to the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) guidelines, our study utilized the Web of Science (WoS) database, culminating in the inclusion of 21 out of 478 scrutinized papers that met all stipulated inclusion criteria. Our findings elucidate that achievement goals, specifically mastery orientation, self-orientation, and task-orientation, exert a positive influence on exercise motivation, spanning the realms of performance, engagement, and achievement. Nevertheless, an excessive emphasis on the avoidance dimensions of these goals may detrimentally impact motivation. To optimize exercise outcomes and bolster motivation, physical education instructors should implement interventions aimed at assisting students in navigating their achievement goals. Strategies encompassing pedagogical methodologies, technological support, and therapeutic approaches may prove advantageous. Future research endeavours should delve into potential variables, both environmental and personal, that could mediate the relationship between achievement goals and exercise outcomes.

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Keywords: Achievement Goals, Exercise Motivation, Exercise Participants

Introduction

The Importance of Achieving Goal

The theory of achievement goals serves as a foundational concept in the domain of sports psychology, functioning as a critical framework through which individual motivation is scrutinized (Ames, 1984; Dweck, 1986; Nicholls, 1984). Originally conceived as a dichotomous construct by Dweck (1986); Nicholls (1984), the theory of achievement goals has undergone evolutionary development. This evolution includes the expansion into trichotomous achievement goals as proposed by Elliot (1999), and subsequently, the formulation of a 2 × 2 framework. This framework is based on the characterization and positivity/negativity of competence, incorporating the approach-avoidance concept, as articulated by (McGregor, 2001). Within the field of exercise science, a multitude of investigations have systematically examined the stability and validity of the 2 × 2 achievement goals framework. This model has played a pivotal role in exploring the individual trajectories of motivation (Conroy, Elliot, & Hofer, 2003) and has exhibited its capability in elucidating motivation and behaviour within the context of exercise. Nevertheless, the universal applicability of this four-dimensional structure has been a subject of academic contemplation. In response, Elliot, Murayama, and Pekrun (2011) re-examined and expanded upon the initial model, introducing a 3 × 2 achievement goals theory to clarify the interaction among diverse goal orientations and the cognitive, affective, and behavioural outcomes of individuals.

Achievement Goals in Exercise

The progression of the achievement goals theory has enabled a comprehensive investigation into the stability and validity of its measurement constructs, model architecture, and the dynamic interrelationship between individual goal orientations and behaviours in physical activity settings. Across the spectrum of two-, three-, and four-dimensional achievement goals (Elliot, 1999; Elliot & Conroy, 2005; McGregor, 2001) , the recently introduced 3 × 2 achievement goals model by Elliot et al. (2011) seems aptly suited to exercise scenarios.

At the core of the orientation toward achievement goals lies the concept of competence, encompassing the cognitive, affective, and behavioural dispositions of individuals within contexts associated with accomplishment (Xiang & Lee, 2002). In the framework of the 3 × 2 model, competence is defined by three dimensions: the absolute criterion is based on task demands, the intrapersonal criterion relates to an individual's past accomplishments,

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and the normative criterion is contingent upon peer performance metrics (Elliot et al., 2011). Within exercise settings, these benchmarks manifest uniquely: competence can be interpreted as the mastery of techniques and strategies (absolute), the improvement of individual prowess or refinement of skills (intrapersonal), or the surpassing of fellow participants (normative) (Nicholls, Perry, & Calmeiro, 2014). In diverse exercise modalities, participants' competence is evaluated based on essential skill metrics, historical benchmarks, or comparative analysis with peer performance outcomes. Simultaneously, two valence criteria arise in exercise contexts: participants may demonstrate competence through skill enhancement, task completion, or outperforming peers (approach valence), or they may endeavour to maintain competence by avoiding setbacks, errors, or losses (avoidance valence) (Lochbaum, Zanatta, & Kazak, 2019).

This study utilizes the achievement goals theory as a framework to investigate the influence of achievement goals on physical activity. It explores the distinctions between contemporary and traditional theory frameworks. To gain a comprehensive understanding of how achievement goals shape exercise motivation, including dimensions like performance, achievement, and engagement, the research conducts a systematic review focusing on four key inquiries: (1) Do achievement goals influence motivation for exercise?(2) Do achievement goals have the potential to impact performance in exercise?(3) Does exercise engagement get influenced by achievement goals? and (4) Do achievement goals have the capacity to shape outcomes in the context of exercise achievement? This investigation seeks to elucidate the disparities between the advancing and traditional frameworks of achievement goal theories, examine the varied benchmarks individuals follow in exercise contexts, and compare the complexities of the 2 × 2 and 3 × 2 achievement goal constructs, with a specific focus on the applicability of the latter within the realm of physical activity.

Theoretical Framework

The principal theoretical framework employed for comprehending exercise motivation is the achievement goals theory (Cuevas-Campos, García-Calvo, & Contreras, 2013). The achievement goals theory integrates concepts from four distinct models: the dichotomous achievement goals model, trichotomous achievement model, 2 × 2 achievement goals model, and 3 × 2 achievement goals model (Dweck, 1986; Elliot, 1999; McGregor, 2001; Nicholls, 1984). Achievement goals represent a deliberate cognitive process characterized by cognitive, emotional, and behavioural attributes (Elliot & Conroy, 2005). Furthermore, the achievement goals theory pertains to individuals' perceptions regarding the significance of learning, academic achievement, labour, and success (Ames, 1992), this constitutes an integrated model encompassing attributions of success or failure, beliefs about one's abilities, and emotional responses (Sommet & Elliot, 2017). This study aimed to employ the achievement goals theory as the theoretical framework to analyse the influence of achievement goals on physical activity. It also sought to comprehend the factors contributing to the divergence between contemporary and traditional achievement goals theories.

Literature Review

Achievement Goals

The Achievement Goals Theory (AGT) has consistently served as a foundational framework for comprehending motivation in achievement for the preceding three decades (Barron & Harackiewicz, 2001; Pintrich, 2000). It explicates how individuals evaluate their self-competence within specific achievement contexts and discern their accomplishments and setbacks (Mascret, Elliot, & Cury, 2015). Despite agreement on its fundamental principles, scholars have displayed varying interpretations of achievement goals. Some underscore its essence as a specific objective, while others highlight its integration with goals and underlying motivations (Ames, 1984, 1992; Dweck, 1986; Nicholls, 1984; Roberts, Treasure, & Balague, 1998). Others, like Elliot and Harackiewicz (1996) frame it as a cognitive schema encompassing cognitive, emotional, and behavioural dimensions. And Ryan and Shim (2006) affirm achievement goals as individuals' perceptions regarding the nature of learning, academic success, and work. They view it as a synthesis of attributions of success or failure, beliefs about abilities, and emotional responses. Likewise, alternative definitions underscore its function as an internal cognitive orientation toward achievement tasks (Pekrun, Elliot, & Maier, 2009; Pintrich, 2000). From a broader perspective, Elliot and Murayama (2008) depict achievement goals as dynamic cognitive objectives emphasizing individual competence.

Maehr and Midgley (1991) highlight its multidimensional character, intertwining elements of achievement, goal, and motivation. Distinguishing it from other cognitive states in exercise, Hwang, Machida, and Choi (2017) emphasize achievement goals as inherently directed towards specific objectives and evaluative cognitive processes. Despite nuanced interpretations over time, the fundamental essence of achievement goals, as articulated by diverse scholars, largely aligns (Dweck, 1986; Maehr & Midgley, 1991; Nicholls, 1984; Roberts et al., 1998).

Classifications of Achievement Goals

Grounded in social cognitive approaches, the dichotomous achievement goals theory elucidates the factors and mechanisms impacting achievement behaviours in relevant contexts, focusing on the interplay between personal factors such as goal orientation (Nicholls, 1984), and environmental factors such as the motivational climate (Ames, 1992). The complex interplay of these factors significantly influences how individuals evaluate or develop their self-competence in specific achievement situations, referred to as goal involvement (Nicholls, 1984). Moreover, disparities in goal involvement impact individuals' inclination to cultivate or exhibit high competence and avoid behaviours indicative of low competence, encompassing factors such as perseverance, choice of tasks, effort, and overall performance (Treasure et al., 2001). Elliot, McGregor, and Gable (1999) enhanced this discussion by introducing a trichotomous achievement goals theory, which includes mastery, performance approach, and performance-avoidance goals. Subsequently, McGregor (2001) further refined mastery goals into mastery-approach and mastery-avoidance, establishing the foundation for the 2 × 2 achievement goals theory—a perspective increasingly prominent in contemporary literature This framework's coherence finds affirmation in subsequent works (Elliot & Church, 1997; McGregor, 2001). Continuing the refinement of the discourse, Elliot et al. (2011) re-examined criteria for competency, incorporating initial valence-motivated characteristics. This resulted in the classification of competencies into absolute, intrapersonal, and normative categories, giving rise to the 3×2 achievement goals model. The evolution of this theoretical model is illustrated in Figure 1.

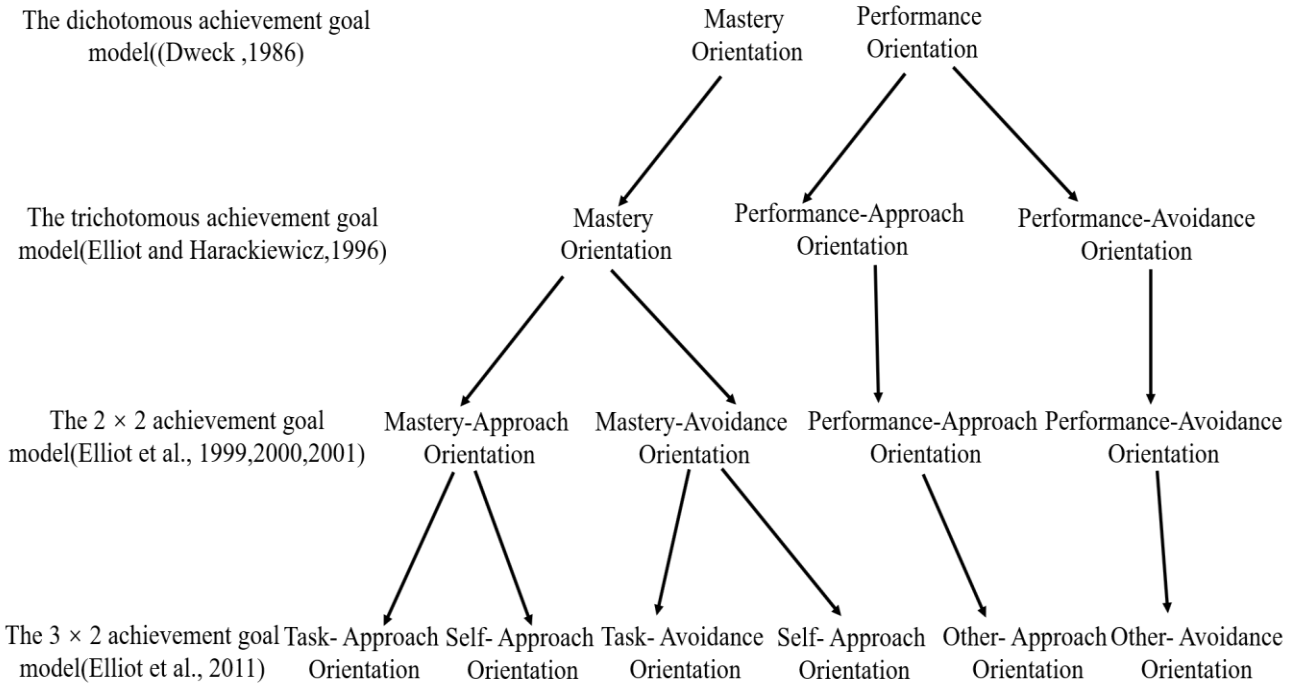

Figure 1. The Development of the Achievement Goals Model

Previous Studies of Achievement Goals on Exercise

Recent research has delved into the influence of achievement goals on exercise. Ruiz et al. (2017) discovered that both task and ego goal orientations influence intrinsic motivation, where task orientation and self-efficacy positively predict self-determination motivation, consequently augmenting enjoyment in exercise. In a related correlation study, Chin, Khoo, and Low (2012) associated ego orientation with intrinsic motivation, extrinsic motivation, and amotivation. Concurrently, Sit and Lindner (2005) identified a noteworthy positive correlation between exercise motivation and both task and ego goal orientations, underscoring their considerable impact on achievement behaviour. Cid et al. (2019) indicated that task orientation not only positively anticipates students' motivation but also exhibits a significant correlation with their intention to participate in exercise. Furthermore, Claver et al. (2020) emphasized the pivotal role of task orientation in moulding the motivational climate within the context of exercise. In a nuanced exploration, Kazak, Lochbaum, and Canpolat (2021) employed a path model, suggesting the mastery-approach goal mediates the link between self-concept and flourishing,

fostering well-being in exercisers. Despite the recognized contributions of dichotomous and 2 × 2 achievement goals models in physical education and exercise, limited research has investigated the applicability of the 3 × 2 achievement goals model in exercise contexts (Refer to Table 1). Considering this gap in knowledge, there is a justified need for a systematic literature review examining the impact of the 3 × 2 achievement goals model on exercise.

Table 1

Previous study of achievement goals model on exercise

Source	Achievement goals model	Finding(s)
(Ruiz et al., 2017)	Dichotomous achievement goals	Achievement, motivation
(Ruiz et al., 2017)	Dichotomous achievement goals	Engagement; exercise strategy
(Chin et al., 2012)	Dichotomous achievement goals	Performance
(Kazak et al., 2021)	2 × 2 achievement goals	Exercise effect
(Sit & Lindner, 2005)	Dichotomous achievement goals	Exercise engagement
(Cid et al., 2019)	Dichotomous achievement goals	Exercise engagement
(Şahin, Çekin, & Yazıcılar Özçelik, 2018)	2 × 2 achievement goals	Achievement
(Claver et al., 2020)	Dichotomous achievement goals	Performance
Innovation of this study	2×2/ 3 × 2 achievement goals	Exercise engagement, Exercise performance, Exercise motivation. Exercise achievement

Exercise Motivation

Motivation, a crucial component of exercise engagement, represents the psychological impetus that instigates and perpetuates physical activity (Stussi et al., 2019). Categorized into extrinsic and intrinsic types, extrinsic motivation involves individuals striving for specific outcomes through exercise, while intrinsic motivation is propelled by the inherent satisfaction derived directly from the activity (Ryan & Deci, 2000). In the context of this study, motivation is conceptualized as the fundamental purpose behind engaging in exercise tasks.

Achievement goals significantly influence individuals' motivation to exercise (Pekrun, 2006). There is a rising interest in discerning the precise impact of achievement goals on exercise motivation, particularly given the growing focus on physical fitness. Previous research suggests that various achievement goals stimulate varied motivational approaches to exercise (D'Astous et al., 2020; Guan et al., 2020; Zimmermann et al., 2021). Nevertheless, a lack of thorough literature reviews persists on this topic. Considering the pivotal role of motivation, it is crucial to evaluate and consolidate insights regarding the influence of the 3×2 achievement goals on exercise motivation.

Performance

Exercise performance, integral to the domain of physical activity, shapes the motivation of individuals aspiring for success (Adie, Duda, & Ntoumanis, 2010). This performance refers to the conduct displayed by individuals during physical activities (Biddle et al., 2003). Specifically, it pertains to how participants execute tasks or assignments set by instructors (Cadenas-Sanchez, Lamoneda, & Huertas-Delgado, 2021). In certain contexts, performance also assesses individuals' perseverance in their ongoing pursuit of exercise-related knowledge (Jung, Kang, & Jang, 2021). Thus, performance offers insights into the management strategies employed by participants in exercise.

While most current research has concentrated on the impact of achievement in determining exercise performance, findings regarding the effects of the 3×2 achievement goals are inconclusive. Some studies propose that participants who attain their specified "achievement goals" demonstrate enhanced performance (Gardner, Vella, & Magee, 2017). Yet, individuals with commendable achievement goals may exhibit suboptimal exercise performance in certain instances (Ingrell, Johnson, & Ivarsson, 2019). A comprehensive review exploring the impact of 3×2 achievement goals on exercise performance has not been undertaken as of yet.

Achievement

Achievement can be conceptualized as an enhancement of an individual's competence (Anderman, 2020) and serves as a benchmark for assessing the capability of activity participants (Mammadov & Hertzog, 2021). In this study, achievement is defined as the successful attainment and proficiency progression in exercise. This construct is assessable through two metrics: perceived achievement,

reflecting an individual's self-assessment of success, and actual achievement, corresponding to tangible exercise outcomes, whether positive or negative.

Considerable research has explored the impact of achievement goals on exercise motivation (Alrakaf et al., 2014; An et al., 2021; Elliot et al., 1999). Research has shown that achievement goals can influence exercise outcomes in a manner similar to other psychological factors (Hagger, Hein, & Chatzisarantis, 2011). Yet, there is insufficient research conclusively establishing how these goals may contribute to improved exercise performance. Additionally, it remains unclear if the impact of achievement goals on performance varies across diverse exercise contexts. Engagement is recognized as a critical factor influencing the effectiveness of exercise (Mata et al., 2021). In this study, engagement refers to the active involvement of students in exercise activities.

Engagement

Engagement is defined as the sustained endeavours made by students to attain task objectives (Kamari et al., 2021). This concept encompasses behavioural and cognitive facets. Behavioural engagement involves active exercise participation, while cognitive engagement reflects the ability to tackle challenging activities. Achievement goal responses in exercise are integral facets of this engagement (Elliot et al., 2005). Many studies have investigated the impact of achievement goals on exercise involvement (Cumming & Hall, 2004; Dewar & Kavussanu, 2011; Isoard-Gautheur et al., 2016). However, the specific effects of achievement goals remain contested. For instance, Adie, Duda, and Ntoumanis (2008) suggested that engagement in exercise situations could significantly influence students' inclination to participate in physical education (PE) classes. However, recent studies have yielded conflicting results. Specifically, Richey et al. (2018) found no discernible link between students' achievement goals and their participation in exercise or PE classes. This sentiment of ambiguity is echoed by Gillet et al. (2017). In light of these inconclusive findings, it is essential to conduct a systematic review to further clarify the matter.

Research Objectives and Research Questions

To comprehensively explore the impact of achievement goals on exercise motivation in terms of performance, achievement, and engagement for exercise participants, this study proposes a systematic review. The four guiding questions are: (1) Can achievement goals influence exercise motivation? (2) Can achievement goals impact exercise performance? (3) Can achievement goals affect exercise engagement? (4) Can achievement goals shape exercise achievement outcomes?

Research Methods

Research Design

This research aims to comprehensively assess the relationship between achievement goals and exercise motivation, performance, and engagement. The study employs a four-step methodology to scrutinize and synthesize prior research, providing a robust understanding of how achievement goals influence exercise motivation. Firstly, relevant literature was identified through the WoS database. Secondly, the VOSviewer software was utilized to analyse trending topics using clustering and mapping techniques. Thirdly, the study adhered to the PRISMA guidelines in examining the literature. Lastly, through the integration and evaluation of selected articles, this research offers an in-depth understanding of the interplay between achievement goals and exercise motivation

Research Corpus

The WoS database serves as a foremost resource that consolidates authoritative and influential journals across various disciplines. Due to its rigorous selection criteria and intricate citation index system, WoS stands as an indispensable tool for bibliometric and scientometric evaluations. An eminent characteristic of WoS is its comprehensive structure, encompassing key indices such as the Science Citation Index-Expanded (SCIE), Social Sciences Citation Index (SSCI), and Arts & Humanities Citation Index (A&HCI). It also includes the Emerging Source Citation Index (ESCI), Current Chemical Reactions (CCR), and Index Chemicus (IC), enhancing its versatility and breadth of coverage.

The present study initiated its investigation by searching the WoS database using a comprehensive set of keywords: "(“achievement goals” OR “goal orientation” OR “task orientation” OR “ego orientation” OR “2×2 achievement goals” OR “3×2 achievement goals”) AND (“exercise motivation” OR “intrinsic motivation” OR “external motivation” OR “autonomous motivation” OR “controlled motivation” OR “sports motivation” OR “engagement motivation” OR “participation motivation”). The search produced a total of 478 bibliographic entries. To identify emerging trends and key topics within this corpus, bibliometric network analysis was performed using VOSviewer software. The analysis specifically concentrated on keyword co-occurrences across the dataset. Figure 2 illustrates the resulting bibliometric network, providing a visual representation of the prevailing themes and their interconnections.

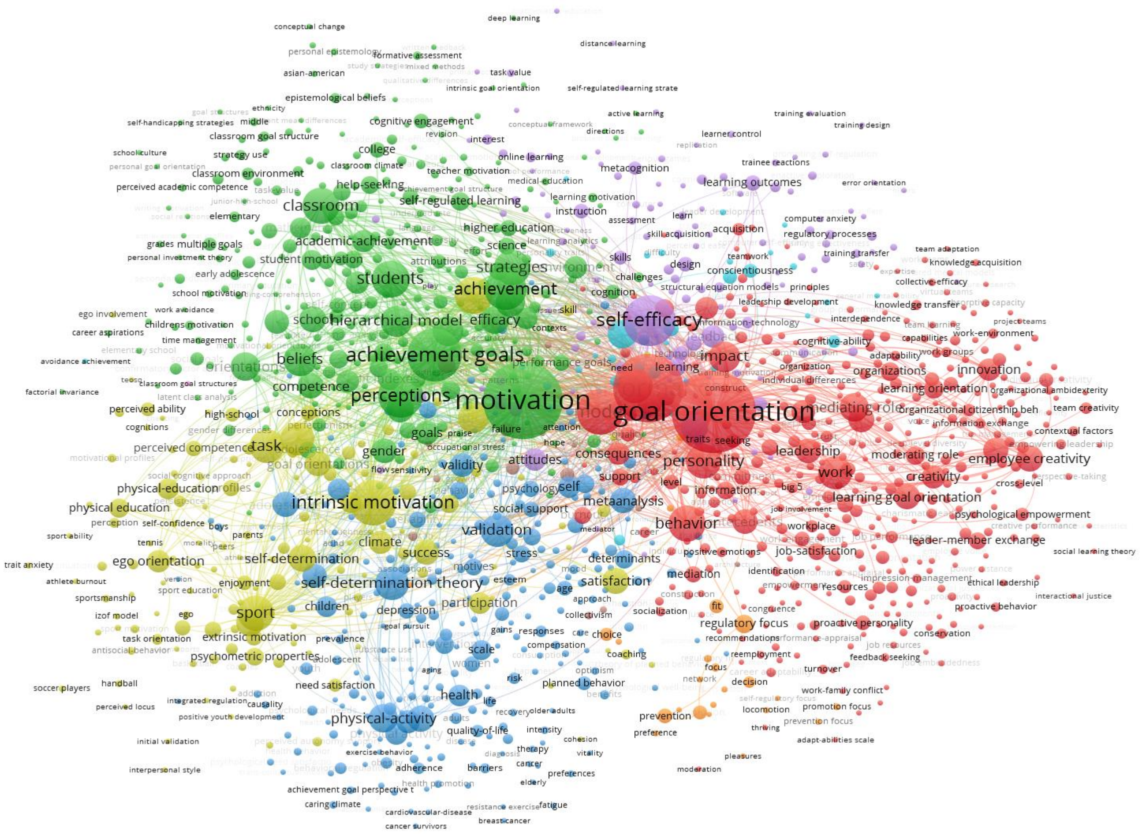

Figure 2 The Bibliographic Network

In the analysis, 498 keywords were classified into six primary clusters. The study identified predominant themes based on the keyword list with the highest number of co-occurrence network links. Specifically, the link strengths were as follows: exercise motivation (N=522), performance (N=509), achievement (N=329), and engagement (N=238). These link strengths highlight that motivation, performance, engagement, and achievement are central research topics in this specific domain.

Inclusion and Exclusion Criteria

Adhering to the PRISMA guidelines, this study has established specific criteria for the inclusion and exclusion of literature. Literature will be included based on the following conditions: (1) A comprehensive exploration of the impact of achievement goals on exercise motivation, performance, achievement, and engagement in the contexts of exercise, sports, or physical activities; (2) The availability of complete content and information relevant to this study; (3) Articles written in English; (4) Clear designation or categorization within the literature; (5) Presentation of reliable and valid results; and (6) Provision of cogent conclusions. Conversely, literature will be excluded under the following conditions: (1) Duplication of content; (2) Articles not written in English; (3) Subpar quality; (4) Unpublished articles or reviews; (5) A research focus on achievement goals that does not extend to exercise motivation, performance, engagement, or achievement; and (6) Insufficient statistical content.

Study Selection

According to the inclusion and exclusion criteria, the literature will be screened by two researchers. The process involves four steps, as outlined in Figure 3. Firstly, researchers got 478 publications from the WoS using a comprehensive set of keywords: "(“achievement goals” OR “goal orientation” OR “task orientation” OR “ego orientation” OR “2×2 achievement goals” OR “3×2 achievement goals”) AND (“exercise motivation” OR “intrinsic motivation” OR “external motivation” OR “autonomous motivation” OR “controlled motivation” OR “sports motivation” OR “engagement motivation” OR “participation motivation”). Utilizing document type criteria, the study filtered reviewer articles, meeting abstracts, early access materials, proceeding papers, editorial content, book chapters, data papers, and letters, resulting in a total of 155 documents. Subsequently, the study screened the titles and abstracts and selected documents for full-text review (N=71). Based on the eligibility evaluation of the full-text reviews, the study ultimately selected 22 publications for systematic review. The Cohen’s Kappa value (0.93) indicated high reliability between the two researchers.

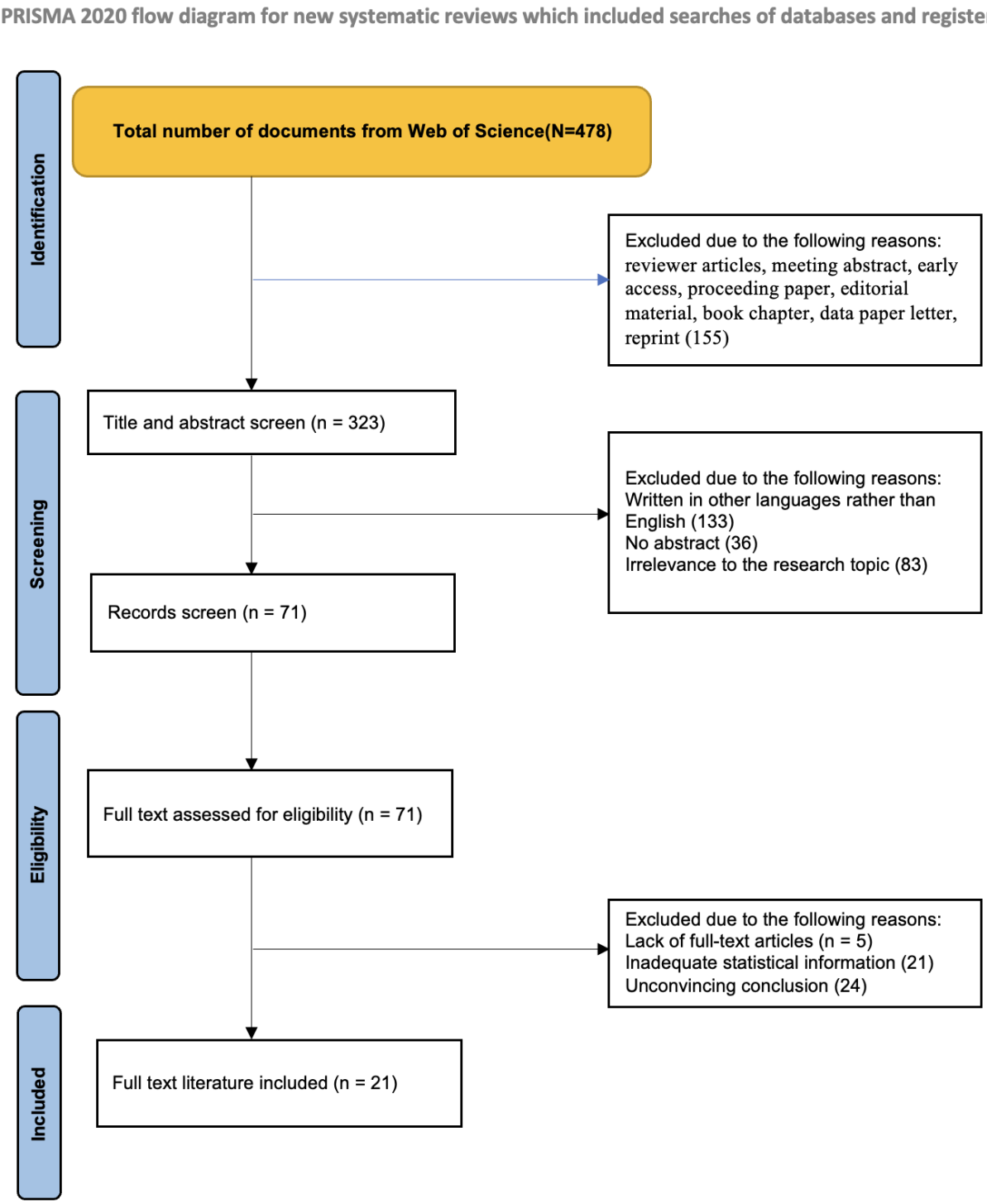

Figure 3 A Flow Diagram of the Study Selection Based on PRISMA.

Quality Evaluation

The quality of the selected papers was evaluated using the assessment method proposed by Kmet, Cook, and Lee (2004). This methodology incorporates two distinct systems designed for assessing both qualitative and quantitative research. For quantitative studies, 14 established criteria are utilized, taking into consideration aspects such as an appropriate sample size and the use of relevant analytical methods. Likewise, the assessment of qualitative studies is based on 14 standardized criteria, covering aspects such as sample design and the incorporation of verifiability checks (refer to Table 2 for specifics). A unique score is assigned to each criterion within these categories. Two independent researchers assigned scores to each article based on the fulfilment of these criteria (yes = 2, partial = 1, no = 0, n/a = not applicable).

Table 2

Checklist for Assessing the Quality of Quantitative Studies related Achievement, Engagement, Performance.

Criteria	
1	Question / objective sufficiently described?
2	Study design evident and appropriate?
3	Method of subject/comparison group selection or source of information/input variables described and appropriate?
4	Subject (and comparison group, if applicable) characteristics sufficiently described?
5	If interventional and random allocation was possible, was it described?
6	If interventional and blinding of investigators was possible, was it reported?
7	If interventional and blinding of subjects was possible, was it reported?
8	Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?
9	Sample size appropriate?
10	Analytic methods described/justified and appropriate?
11	Some estimate of variance is reported for the main results?
12	Controlled for confounding?
13	Results reported in sufficient detail?
14	Conclusions supported by the results?

The data presented in Table 3 reveals a noticeable disparity in the methodological quality of the studies, assessed by the Kmet quality assessment criteria. Scores range from 50% to 91%. Among the evaluated studies, ten were classified as high quality, indicating a Kmet score exceeding 80%. Furthermore, two studies were identified as very high quality, with a Kmet score surpassing 90%.

Table 3

Methodological Quality of Studies

STUDY	Kmet quality items														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total Score
In terms of performance mean score 77.7%															
(Knoblochova, Mudrak, & Slepicka, 2021)	**2**	**2**	**2**	**2**	**2**	**0**	**1**	**2**	**2**	**2**	**2**	**1**	**2**	**2**	**86%**
(Rivera Pérez et al., 2021)	**2**	**2**	**2**	**2**	**n**	**n**	**n**	**2**	**1**	**2**	**2**	**0**	**2**	**2**	**86%**
(Claver et al., 2020)	**2**	**2**	**2**	**2**	**n**	**n**	**n**	**2**	**2**	**2**	**2**	**1**	**2**	**0**	**86%**
(Isoard-Gautheur et al., 2016)	**2**	**2**	**2**	**2**	**n**	**n**	**n**	**2**	**2**	**2**	**2**	**0**	**2**	**2**	**86%**
(Marjanović, Comoutos, & Papaioannou, 2019)	2	2	2	2	n	n	n	2	2	2	0	0	2	1	77%
(Şahin et al., 2018)	2	2	2	2	n	n	n	2	2	1	1	0	2	1	64%
(Cid et al., 2019)	1	2	0	2	n	n	n	1	1	2	1	0	2	1	59%
In terms of achievement mean score 76.2%															
(Cho et al., 2019)	**2**	**2**	**2**	**2**	**n**	**n**	**n**	**2**	**2**	**2**	**2**	**0**	**2**	**2**	**91%**
(Wei et al., 2020)	**2**	**2**	**2**	**2**	**n**	**n**	**n**	**1**	**2**	**2**	**1**	**1**	**2**	**2**	**86%**
(Hwang et al., 2017)	**2**	**2**	**1**	**2**	**n**	**n**	**n**	**1**	**2**	**2**	**1**	**1**	**2**	**2**	**82%**
(Sit & Lindner, 2005)	2	2	1	2	n	n	n	1	1	1	2	1	2	2	77%
(Ingrell et al., 2019)	1	2	2	1	n	n	n	1	1	1	2	0	1	2	73%
(Wei et al., 2020)	2	2	1	0	1	0	0	2	2	2	2	1	2	2	68%
(Cowden, Mascret, & Duckett, 2021)	2	2	1	2	1	2	0	2	1	1	0	1	1	0	57%
In terms of engagement mean score 72.1%															
(Chin et al., 2012)	**2**	**2**	**2**	**2**	**n**	**n**	**n**	**1**	**2**	**2**	**1**	**1**	**1**	**2**	**82%**
(Mata et al., 2021)	**2**	**2**	**1**	**2**	**n**	**n**	**n**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**91%**
(Kazak et al., 2021)	**2**	**2**	**2**	**2**	**2**	**0**	**0**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**86%**
(Ruiz et al., 2017)	2	2	1	0	n	n	n	2	2	0	0	0	2	2	73%
(Jung et al., 2021)	2	2	0	1	n	n	n	1	1	2	2	0	2	1	64%
(Monteiro et al., 2018)	1	1	1	2	n	n	n	1	1	1	0	1	2	2	59%
(Rodrigues et al., 2020)	2	1	2	2	n	n	n	1	0	2	0	0	1	0	50%

Data Abstraction and Synthesis

The study adopted the abstraction and synthesis methodology proposed by Bridges et al. (2020), in the first phase, two researchers conducted a meticulous examination of articles, emphasizing key factors including samples, robustness, analytical methodologies, and the impact of achievement goals. This process yielded a substantial inter-coder reliability (α= 0.88). Subsequently, the amassed data was categorized into three main domains: engagement, exercise motivation, and achievement. Lastly, the researchers presented a comprehensive analysis elucidating the influence of achievement goals on exercise motivation, performance, engagement, and overall achievement.

Descriptive Information

The selected literature underwent categorization according to various criteria, including publication date, sample population, age, sample size, country, and research methods, as outlined in Table 2. The chosen publications span the years 2005 to 2021. Of the 21 selected works, the predominant focus was on adolescent students, with nine studies targeting adults and eleven examining athletes. Geographically, the participant distribution covers several countries, with three

studies each from Portugal, the United States, and Spain. Additionally, two studies each originated in Turkey and China, while single studies represent other countries, namely the Czech Republic, Korea, Serbia, South Africa, France, and Finland. The literature exhibited a spectrum of sample sizes, ranging from 107 to 1,292 participants. In terms of research methodologies, the 21 studies utilized diverse approaches to explore the impact of achievement goals on exercise motivation. These included Structural Equation Modelling (N=11), Multiple Regression Analysis (N=5), Correlation Analysis (N=2), ANOVA (N=1), MANOVA (N=1), and Social Network Analysis (N=1).

Table 2

Literature Classified Table

Literature	Sample population	Age	Sample size	Country	Achievement goals model	Research methods	Domain
(Knoblochova et al., 2021)	Beach volleyball players	26 ± 6	128	Czech	Dichotomous	Multiple Regression Analysis	Performance
(Cho et al., 2019)	Students	11	107	America	Trichotomous	Structure Equation Model	Achievement
(Cowden et al., 2021)	Tennis athletes	15~25	323	South Africa	3×2	ANOVA	Achievement
(Wei et al., 2020)	College students	20	406	China	3×2	Structure Equation Model	Achievement
(Ruiz et al., 2017)	Athletes	20 ± 4	494	Finland	Dichotomous	Structure Equation Model	Engagement
(Hwang et al., 2017)	Students	8~15	141	America	Dichotomous	Social Network Analysis	Achievement
(Ingrell et al., 2019)	Athletes	10~15	78	Spanish	Dichotomous	Multiple Regression Analysis	Achievement
(Chin et al., 2012)	Athletes	13~15	589	Malaysia	Dichotomous	Multiple Regression Analysis	Engagement
(Mata et al., 2021)	High school Students	15	1369	America	Trichotomous	MANOVA	Engagement
(Kazak et al., 2021)	Adults	18~40	580	Turkey	2 × 2	Multiple Regression Analysis	Engagement
(Sit & Lindner, 2005)	Youth	17	1235	China	Dichotomous	Structure Equation Model	Achievement
(Jung et al., 2021)	High-school basketball players	14~18	256	Korea	3×2	Structure Equation Model	Engagement
(Cid et al., 2019)	Students	10~18	618	Portugal	Dichotomous	Structure Equation Model	Engagement
(Şahin et al., 2018)	Sports students	16~30	127	Turkey	Trichotomous	Correlation Analysis	Performance
(Claver et al., 2020)	Students	12~18	919	Spanish	Dichotomous	Structure Equation Model	Performance
(Monteiro et al., 2018)	Football athletes	13~20	403	Portugal	Dichotomous	Structure Equation Model	Performance
(Rodrigues et al., 2020)	Students	10~18	589	Portugal	Trichotomous	Structure Equation Model	Engagement
(Isoard-Gautheur et al., 2016)	Athletes	21	359	France	2 × 2	Structure Equation Model	Performance
(Rivera Pérez et al., 2021)	Primary, secondary, and baccalaureate students	10~19	1292	Spanish	3×2	Multiple regression analysis	Performance
(Moreno et al., 2010)	Exerciser	16~78	727	Spain	2 × 2	Structure Equation Model	Achievement
(Marjanović et al., 2019)	Adolescents students	14	617	Serbia	Dichotomous	Correlation Analysis	Performance

Results

This segment of the investigation summarizes the impact of achievement goals on exercise motivation concerning engagement, performance, and achievement. The findings of this influence are detailed in Table 3.

Table 3

The Effect of Different Achievement Goals

Achievement goals orientation	Motivation	Performance	Engagement	Achievement
Task	+		+	
Ego	+	+	+	
Mastery approach	+	+		
Mastery avoidance				
Performance avoidance	+and-	+	+	
Task- approach	+			+
Task- avoidance	+	+	+	
Self-approach	+			+
Self- avoidance	+	+		+
Other - approach	+	+		
Other- avoidance	-	-		-

Note: The effects of achievement goals on exercise outcomes are on the horizontal axes; achievement goals and indicators of exercise motivation are on the vertical axes. "+" positive effect. The symbol "–" negative effect.

RQ1: Could Achievement Goals Influence Exercise Motivation

Achievement goals, exemplified by mastery-approach and mastery-avoidance orientations, commonly serve as motivational factors for individuals to partake in physical exercise. Augmenting students' adherence to achievement goals proves instrumental in bolstering their motivation to engage in PE classes or extracurricular activities (Jung et al., 2021). Empirical evidence suggests that students demonstrate elevated levels of achievement goals within exercise contexts when their motivation is reinforced (Sit & Lindner, 2005).

On the contrary, performance goals may occasionally exert an adverse influence on students' motivation to engage in exercise. Within the 3×2 achievement goal framework, specifically in the "other avoidance" category, effects akin to the 2×2 achievement goals are observed. Students harbouring these "other avoidance" achievement goals typically lack the inspiration to participate in exercise or PE classes (Gillet et al., 2017). Similarly, college students with diminished enthusiasm for exercise in their PE classes reported lower levels of achievement goals (Cho et al., 2019). Particularly, the performance-avoidance goal has been noted to dampen exercise motivation in high school students, potentially hindering the attainment of optimal exercise outcomes (Claver et al., 2020).

RQ2: Could the achievement goals influence exercise performance?

Research suggests nuanced differences in the relationships between achievement goals and exercise performance. Mastery, task, and self-orientations seem to positively impact exercise performance more than their negative counterparts. For example, college athletes striving to refine their sports skills consistently demonstrated superior performance (D'Astous et al., 2020). Likewise, Chinese athletes improved their exercise performance when motivated by mastery-oriented achievement goals (Wei et al., 2020). Corroborating these findings, Parker et al. (2021) observed that during two semesters of PE classes, students emphasizing self-orientation and task orientation demonstrated superior performance compared to their peers who predominantly identified with performance or other orientations (Strunk et al., 2021).

Nevertheless, the impact of achievement goals on exercise efficacy is a topic of debate. Certain studies propose that elevated achievement goals can adversely affect adolescent performance. For instance, students exhibiting mastery avoidance demonstrated less proactive engagement and exerted diminished effort, heightening the risk of suboptimal performance in exercise activities (Stoeber, Uphill, & Hotham, 2009). Additionally, elementary students with distorted perceptions of their physical education abilities frequently associated with achievement goals oriented toward others. This misalignment potentially contributed to reduced performance in physical activities (Moreno et al., 2010).

On the flip side, adopting a mastery orientation is commonly regarded as advantageous for exercise performance. Minimizing emphasis on avoidance has been associated with enhancements in students' exercise efficiency (Ingrell et al., 2019). In virtual PE learning environments, students with low achievement goal levels in theoretical PE studies excelled in practical PE sessions (Rivera Pérez et al., 2021). Adopting a performance approach or an alternative approach orientation can positively impact students' performance in PE classes, potentially fostering heightened effort and resilience against setbacks (Mata et al., 2021). Many fitness enthusiasts assert that a performance orientation boosts their engagement and overall performance in group exercise activities. Dissatisfaction prompts them to adopt solution-oriented coping strategies (Ruiz et al., 2017).

RQ3: Could achievement goals influence exercise engagement

Controversy surrounds the impact of achievement goals on exercise engagement. Evidence indicates that a mastery orientation serves as a motivating factor for university students, prompting their participation in various exercises and physical activities (Wei et al., 2020). Moreover, the study revealed that Chinese college students exhibiting a robust mastery goal orientation were predisposed to broaden their knowledge and demonstrated a strong desire to excel in their PE classes. This resulted in increased engagement not only within PE sessions but also in broader exercise contexts (Wei et al., 2020). In contrast, Korean high school students showed reluctance to participate in exercise or sports due to fear of failure in competitive settings (Jung et al., 2021). Studies highlight that performance-avoidance and other avoidance orientations tend to reduce engagement among exercisers (Cuevas-Campos et al., 2013; Ingrell et al., 2019; Knoblochova et al., 2021; Marjanović et al., 2019).

RQ4 Could achievement goals influence exercise achievement?

The connection between achievement and success significantly influences students' exercise outcomes. Approach-oriented achievement goals promote success, while avoidance-oriented goals may hinder it. Notably, a positive correlation exists between students' achievements in PE classes, technology usage, and satisfaction (Butz, Stupnisky, & Pekrun, 2015). On the contrary, avoidance-oriented achievement goals have been demonstrated to negatively impact success in exercise (Sit & Lindner, 2005). In online semesters, certain university students may experience suboptimal exercise performance attributed to a lack of motivation (Roque Herrera & Alonso García, 2021) . Interestingly, Korean undergraduates who expressed elevated achievement goals perceived a lower level of achievement in exercise compared to those who experienced a profound sense of accomplishment from the activity (Jung et al., 2021). Research on achievement goals aims to understand their roles in diverse contexts, including exercise, physical activities, and sports, suggesting the potential for similar influences across these scenarios (Claver et al., 2020).

Discussion

This study assessed the influence of achievement goals on exercise motivation, focusing on performance, engagement, and achievement. The review of 21 pieces of literature revealed that achievement goals, particularly mastery or task/self-orientation, positively affected exercise motivation, achievement, and engagement performance. Essentially, approach-oriented facets of achievement goals play a crucial role in enhancing exercise outcomes. These findings are consistent with prior research (Chin et al., 2012; Isoard-Gautheur et al., 2016; Knoblochova et al., 2021; Sit & Lindner, 2005) Individuals with positive achievement goals exhibited enthusiasm for exercise and physical activities, displaying a

willingness to engage with peers and coaches. These participants demonstrated a proactive approach to acquiring knowledge, reflecting on their exercise experiences, and attaining their fitness objectives (Cuevas-Campos et al., 2013). As a result, these individuals demonstrated heightened levels of exercise motivation, performance, engagement, and achievement.

Nevertheless, it is essential to emphasize that tendencies toward performance-avoidance can detrimentally impact exercise performance. Apart from diminishing the effort and proactive strategies employed by exercise participants, performance-avoidance may lead to inferior exercise outcomes (Ingrell et al., 2019). Students experiencing heightened self-avoidance tendencies may downplay their achievements, resulting in reduced task commitment and, consequently, suboptimal exercise performance. Notably, younger exercisers appear to be more susceptible to these adverse effects than their older counterparts (Hwang et al., 2017). Hence, educators and coaches should prioritize fostering mastery-approach or task/self-approach orientations, particularly among younger exercisers.

Conclusion

This study thoroughly investigated how achievement goals impact motivation, engagement, performance, and achievement in exercise. The results revealed a notable trend: approach-oriented goals significantly outperform avoidance-oriented goals in enhancing motivation, engagement, performance, and overall achievement in exercise and physical activity settings. While recognizing the undeniable merits of approach factors, it's crucial to acknowledge the nuances linked to avoidance factors in achievement goals. These tendencies, often arising from task-related anxieties, can hinder an exerciser's performance and overall accomplishment. Addressing these factors is essential for ensuring comprehensive development in exercise contexts.

Additionally, the study highlighted the significant influence of external interventions in shaping achievement goals beyond exercisers' inherent traits. Through targeted interventions—whether instructional, technological, or therapeutic—it is possible to adjust exercisers' achievement goals, acting as effective tools to enhance exercise performance. This underscores the complex interaction between individual predispositions and external influences. In conclusion, while individual predispositions significantly impact exercise outcomes, the study highlights the transformative potential of specialized interventions. Applying these insights can lead to more effective training regimes, fostering optimal outcomes in both individual and group exercise settings.

Research Implications

Using teaching interventions to shape achievement goals has significantly boosted exercisers' motivation, engagement, and overall performance. Creating a supportive exercise environment is crucial for instructors, fostering emotional expression and skill-based coping strategies among participants (Rodrigues et al., 2020). Establishing peer support groups can be a cornerstone for students, enhancing achievement support and creating a student-centred exercise environment, ultimately boosting their intrinsic motivation for exercise (Ingrell et al., 2019). Instructors and coaches can create collaborative exercise scenarios to enhance participants' enjoyment during the exercise experience.

Furthermore, incorporating technological interventions, such as augmented reality (AR) and virtual reality (VR) applications, holds great potential in enhancing exercisers' motivation and achievements. These innovations provide dynamic, captivating, and immersive exercise experiences, significantly amplifying participant engagement (Chen, Huang, & Chou, 2019). Utilizing innovative exercise platforms can boost participant motivation and engagement, setting the foundation for success in exercise routines (Liang, da Costa Junior, & Piumarta, 2020). Moreover, video games centred around exercise or sports emerge as powerful educational tools with the potential to enhance exercise outcomes (Partovi & Razavi, 2019).

To counteract negative achievement goal tendencies and promote positive ones in exercisers, instructors can employ therapeutic approaches. Targeted interventions for achievement goal regulation motivate participants to invest effort in learning emotion-management techniques, enhancing their exercise motivation (Lochbaum & Stevenson, 2014). Implementing Attributional Retraining (AR) is crucial for reducing apprehensions by prompting participants to attribute more realistic reasons for setbacks, ultimately improving exercise performance outcomes.

Limitations

Regarding the present research, it's important to note a couple of limitations. Firstly, due to restrictions on library sources, our study couldn't include all relevant papers. Additionally, the scope of the current study was limited, with an observed inverse correlation between achievement goals and exercise motivation (Marjanović et al., 2019). This research focused solely on the influence of achievement goals on exercise motivation, neglecting their impact on exercise outcomes. Moreover, the study didn't explore how diverse cultural and educational environments might affect participants' exercise habits. The absence of

examination into the moderating roles of cultural-educational elements is a limitation. Additionally, the research only considered English-language publications, potentially overlooking valuable contributions in other languages.

Recommendations for Further Research

Exploring the influence of cultural and educational settings on the nature and expression of achievement goals requires comprehensive investigation (Kumar & Gunawardana, 2014). Unfortunately, there is limited research on whether achievement goals differ among exercise participants across diverse cultural and educational backgrounds. Fewer studies explore the implications of these goals in such contexts. Future research should prioritize controlled experiments to determine if achievement goal dynamics vary among exercisers in different cultural and educational settings

Furthermore, a key area for future research is understanding how contextual elements may mitigate or amplify the impact of achievement goals on exercise outcomes. For example, exploring whether individuals from individualistic societies exhibit increased self-orientation compared to those from collectivist cultures and how such differences may influence exercise outcomes. Building on previous insights into teaching interventions, technological advancements, and therapeutic techniques, it would be fascinating to explore how these interventions interact with cultural and educational factors, shaping achievement goals and their impact on exercise. This multifaceted approach can provide a more comprehensive understanding of achievement goals in exercise across diverse setting.

Data availability statement

The original contributions given in the research are available in the article/Supplementary Material; relevant authors may be contacted for more information.

Ethics approval and consent to participate

Not applicable

Author contributions

XL: designed, collected, analyzed data, wrote, and drafted this article. NJ: data interpretation, SK: revised and approved the article.

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Conflict of interest

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