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Review

Interpersonal Behavior, Basic Psychological Needs, Motivation, Eating Behavior, and Body Image in Gym/Fitness Exercisers: A Systematic Review

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Abstract: Background: Body image seems to be a determining factor in the behavior and satisfaction of the basic psychological needs of exercise practitioners in gyms and fitness centers, and may influence motivation, interpersonal behavior, and eating behavior. This review aims to examine possible patterns between the variables under study in a gym/fitness context, specifically considering if body image perception has a determinant factor. Methods: Web of Science, PubMed, SCOPUS, and Psycnet were consulted and only data published between 2007 and 2021 were considered in the present review. After an initial search of 1373 records, a total of 6 were considered eligible for a detailed analysis after checking for the inclusion and exclusion criteria. Results: There is a positive relationship between body image dissatisfaction and less self-determined forms of motivation, as well as the adoption of less healthy eating behaviors. Younger participants have higher levels of body image dissatisfaction and unhealthy eating behaviors. Conclusions: Body image dissatisfaction leads to less self-determined forms of motivation for exercise in the context of gyms and fitness centers. On the other hand, a negative perception of body image can also lead to sustained patterns of less regulated forms of exercise and less healthy eating behaviors.

Keywords: self-determination theory; well-being; fitness sustainability; adherence; eating disorder; body dissatisfaction

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1. Introduction

The psychological and physical benefits of regular practice of exercise are well documented, although rates of exercise adherence and maintenance do not achieve the recommended levels [1,2]. Recent data showed that 45% of European adults do not reach the physical activity guidelines, reporting that they never exercise or play sport [3]. One of the primary reasons for the poor adherence rates in terms of exercise may be the motivation, as a lack of motivation may possibly undermine the positive effects of physical activity.

Prior studies have evaluated various motivational frameworks to expand the literature on strategies for enhancing physical activity levels [4]. A recent study has shown that individuals will drop out in the first stages of practice [5]. In line with motivational theories, previous research has not provided a comprehensive examination of alternative cognitive factors when analyzing the commitment to exercise among individuals engaged in gym or fitness activities, such as body image (BI) and eating behavior [6]. Social networks influence the creation of stereotypes regarding the idea of an ideal body, usually with a distorted view of the BI.

Individual choices regarding physical exercise or the adoption of a sedentary lifestyle, which includes physical inactivity, are outcomes shaped by a unique combination of

personal, health, medical, social, psychological, motivational, and environmental factors. The interplay among these factors molds individual goals, preferences, obstacles, and, subsequently, habits, all of which collectively influence one's lifestyle. Given the multitude of influences on people's physical activity behaviors, it is important to note that these factors are not fixed or static. [5].

Self-Determination Theory

Several theories have been used for the study and understanding of behavioral change, seeking to help this change in individuals in highly varied contexts. According to Michie et al. [6], in a study where 83 theories related to behavioral change were presented, more than 30 of these theoretical models addressed motivation. However, self-determination theory (SDT) [7,8] has been the most used supporting theoretical framework to explain people's cognitive, behavioral, and emotional patterns in physical exercise [4,9]. In addition, some studies [10,11] claim that SDT is the most widely used motivational model among researchers in order to understand the influence of human motivation on several outcomes in the exercise context. SDT addresses the motivational dynamics underlying human behaviors, proposing that these can be regulated by different types of motivation (differing in quality), organized on a continuum of increasingly self-determined behaviors [12,13]. Among several theories examining motivation, SDT distinguishes itself by its emphasis on personality factors, the surrounding context, and the underlying causes and outcomes of self-determined behavior [8].

This macromodel of human motivation encompasses six microtheories, each of which systematizes key aspects of motivation, which invariably contribute to a better understanding of cognitive, behavioral, and emotional outcomes related to practitioners' goals in highly varied contexts [12]. Three of the most researched and applied microtheories in the context of physical activity are the Cognitive Evaluation Theory, the Basic Psychological Needs Theory, and the Organismic Integration Theory [5].

Cognitive Evaluation Theory

This theory proposes a viable theoretical framework for explaining the detrimental effects of contingent performance rewards on intrinsic motivation and how social and contextual factors can promote or inhibit this type of motivation [9]. It centers its attention on the influence of the social environment on intrinsic motivation, particularly regarding how rewards, interpersonal limitations, and imposed restrictions can hinder intrinsic motivation and diminish interest in one's own activities. In simpler terms, the absence of coercive pressure, the provision of opportunities for optimal growth and challenges, and fostering interpersonal warmth can enhance intrinsic motivation. Conversely, normative judgments, regulated surveillance, the presentation of excessively simple or difficult tasks, and distant relationships can undermine this type of motivation [5].

Organismic Integration Theory

Self-determination theory came to revolutionize the idea of motivation as a motivational continuum, varying the quality of motivation based on the degree of self-determination. Thus, motivation can be manifested in six ways, ranging from more self-determined forms to less self-determined forms and divided from a macro perspective into intrinsic motivation, extrinsic motivation, and amotivation [7]. Intrinsic motivation is the most self-determined manifestation of motivation. As previously mentioned, people who perform a certain behavior, regulated by intrinsic motivation, experience pleasure, fun, and a feeling of exploration, among other sensations inherent to the behavior itself. Intrinsically motivated people do not seek to obtain rewards by performing the behavior. Its performance is purely an expression of the person and the person's identity [12].

Following the motivational continuum towards less self-determined regulations, extrinsic motivation emerges, which characterizes situations in which behavior is carried out with the aim of obtaining certain benefits, other than the pleasure and fun arising from its performance. Along the motivational continuum, there are different ways of regulating

extrinsic motivation. The most self-determined form is called integrated regulation. In this type of regulation, the subject voluntarily integrates their behavior, with a high degree of congruence with their values and needs [12]. Next is the identified regulation, where the individual acknowledges the significance of the behavior and is driven by an appreciation for the outcomes and advantages of engaging in that behavior [8], although he may not like to perform it or even consider it interesting. Unlike integrated regulation, where the behavior is involved in everyday activities in full harmony, in identified regulation, the person consciously accepts the behavior and, thus, experiences a relatively high degree of will or willingness to act [5].

In a less self-determined way, but still integrated into extrinsic regulations, introjected regulation is conceptualized by internal pressures, namely feelings of guilt and anxiety, which lead to the performance of the behavior [8]. In these cases, the individual accepts the reason why he performs the behavior, but does not identify with it, nor internalize it. The source of motivation based on introjected regulation for a behavior is guilt, worry, or shame. Thus, introjected regulation inspires the individual to perform a behavior not because he wants to, but because he fears that by not doing so, he could jeopardize his representation with peers [5].

Finally, at the extreme end of extrinsic regulations, there is external regulation, considered the most controlled form within the less self-determined regulations. In this regulation, the subject performs the behavior to satisfy external demands, sometimes related to obtaining rewards. This regulation is the most controlled of all because the maintenance of motivation and, consequently, the behavior depends on the continuous presence of external monitoring and reinforcement [7].

Amotivation resides at the far end of the motivational spectrum and signifies the lowest level of self-determined motivation. In this scenario, there is an absence of regulation or intention to engage in a specific behavior, and the behavior occurs without conscious intent or proactive consideration (for example, a person might cease physical activity without clear reasons or intentions for resuming it in the future). The individual no longer perceives the importance of their actions, followed by a feeling of incompetence and loss of control [12]. This absence of regulation or lack of intention to act for a given behavior indicates that the probability of giving up is high and that its return may be compromised unless there is support for change from the surroundings [8].

Basic Psychological Needs and motivation

The occurrence of behavioral changes, for example, going from slightly active or even sedentary behaviors to a regular exercise behavior, has been suggested as a change in motivational focus, with satisfaction of basic psychological needs, causing people to move from a more controlled motivation towards a more autonomous motivation [14] and, with that, to integrate the exercise behavior as a habit [15].

The basic psychological needs satisfaction leads to autonomous behavior if the socio-environmental context promotes their satisfaction and/or support [12]. Individuals who experience the frustration of these basic psychological needs seemed to be more likely to develop higher levels of controlled motivation in each activity, which is considered harmful to the persistence and adherence to the activity, as it promotes negative results, such as malaise, exhaustion, and failure [16]. However, when talking about the satisfaction or frustration of basic psychological needs, low levels of satisfaction do not represent a direct cause of high levels of frustration, and these behaviors must be analyzed separately [17].

Interpersonal behavior

The SDT proposes that interpersonal behaviors (support or frustration) within a given context are a result of the quality of motivation (autonomous or controlled) [12]. In a sporting context, the coach's behavior can have a crucial impact on the athlete's motivation [18]. In the context of physical exercise, specifically in gyms, physical exercise coaches can satisfy the basic psychological needs of practitioners, giving freedom of choice and providing alternatives (autonomy support), having positive behaviors such as offering

positive feedback in relation to the domain of the task (competency support), and showing understanding and support (relationship support) [18].

In contrast, they may exhibit inverse behaviors, frustrating basic psychological needs, using controlling rewards and forcing demands (autonomy frustration), adopting behaviors that emphasize guilt and doubt of the practitioners' capabilities (competence frustration), and exhibit rejection behaviors towards the practitioner (relationship frustration). It is important to clarify that a supportive behavior is not the opposite of a frustration behavior, because practitioners can perceive both types of behavior [4].

Bartholomew et al. (2009) [19] clearly demonstrated the importance of the interpersonal behavior of physical exercise technicians towards practitioners and how they perceive the behavior. Thus, it is extremely important to be clear about the informational and behavioral component, avoiding constraints and making sure that the practitioner is in his open to appreciate being rewarded for his hard work. Therefore, interpersonal behaviors may be predictors of basic psychological needs, and at the same time of motivation regulation [19].

Eating behavior and body image

Body image (BI) can be defined as a "person's perceptions, thoughts, and feelings about their body" [20]. Social networks and the media influence the creation of stereotypes of ideal bodies, often giving rise to a distorted view of BI that translates into the perception that subjects have of their own body and that can generate feelings of satisfaction or dissatisfaction. Nowadays, resulting from the social stereotypes of body ideals, which are very difficult to achieve without embracing extreme behaviors [21,22], unhealthy eating behaviors (EBs) and poor body image satisfaction are highly prevalent, especially in the younger population, where less healthy eating behaviors could represent health problems in the medium and long term [23].

Effectively, the way someone regulates their motivation in relation to a specific behavior is influenced by an individual set of contextual, social, and personal factors, such as the perception of body and self-image. Research supports the hypothesis of motivational transfer between self-determined motivations for exercise and dietary regulation in adults with a normal weight. This indicates that individuals who are more physically active tend to possess stronger self-determined motivations for exercise and dietary control, leading to increased mindfulness of their body's cues and nutritional requirements [22]. Thus, it is important to investigate exercise as a potential protective factor, considering that exercise can help to enhance BI [24–26] and contribute to healthier EBs [27–29]. On the other hand, it is possible that the motivations for engaging in physical exercise can affect the positive effects of EB and BI [30,31].

According to this, it may be possible that some kinds of exercise motivation interactions and goals have a negative effect, and they must be avoided by exercise professionals to prevent negative behavioral and psychological outputs. Thus, it is important to have evidence that can show the relationship between the interpersonal behavior, motivation, EB, and BI.

Previous systematic reviews have explored this issue [22] but have not considered if body image perception has a determinant factor. In fact, one's body perception can influence physical activity practices and eating behaviors [32].

This review aims to explore possible patterns between the variables under study in a gym/fitness context specifically. This pattern can be used as a foundation for future studies. The positive influence of these variables on the practitioner may be a key factor for maintaining the practice of physical exercise and for the individual to remain active throughout his life, promoting higher levels of health and well-being, thus leading to a decrease in current levels of physical inactivity and gym drop-out.

2. Materials and Methods

The approach of this study adhered to the PRISMA guidelines, which stands for Preferred Reporting Items for Systematic Reviews and Meta-analyses [31]. The research query and inclusion criteria were established through the utilization of the PICOS approach.

Searches included various combinations of three sets of terms: (a) terms concerning the population of interest (e.g., adults, exercisers), (b) terms concerning our independent variables (e.g., interpersonal behavior, basic psychological needs, motivation), and (c) terms concerning the outcomes of interest (e.g., body image, eating behavior).

Research Strategy

We performed an extensive literature search across the following databases: Web of Science, Scopus, PubMed, and PsycNET; the search was carried out during 23 May 2023 to 31 July 2023. Keywords used were "interpersonal behaviour*", "basic psychological need*", "motiv*", "eating behaviour*", "body image*", and "exercise*". These have been used in different combinations associated with body image and exercise, through the inclusion of "AND" or "OR", like body image AND exercise AND interpersonal behavior OR basic psychological needs OR motivation OR eating behavior. Bibliographic references were then examined to include potential studies that could meet inclusion criteria for further analysis.

PubMed example: ("body image") AND (exercise)) AND (("interpersonal behavio*") OR ("basic psychological needs") OR (motivation) OR ("eating behavio*")). Distinct procedures were employed for various databases:

(i) In PsycINFO, the search required separate queries for the title and abstract, necessitating different combinations. (ii) In PubMed, the search focused on title and abstract rather than keywords. (iii) In Web of Science and Scopus, specific combinations were used. Title, abstract and keywords were termed "topic". The only filter applied was records from 1985 until August 2023. The search strategy for PubMed was as follows: (((((((interpersonal behaviour[Title/Abstract]) AND (basic psychological needs[Title/Abstract])) AND (exercise[Title/Abstract])) OR (basic psychological needs[Title/Abstract])) AND (motivation[Title/Abstract])) AND (exercise[Title/Abstract])) OR (motivation[Title/Abstract])) AND (body image[Title/Abstract])) AND (exercise[Title/Abstract]) OR (eating behaviour [Title/Abstract])) AND (body image[Title/Abstract])) AND (exercise[Title/Abstract]). The only filter applied was records from 1985 until August 2023, and 1373 results were obtained.

Inclusion/Exclusion Criteria

We employed the following inclusion criteria: 1. studies of an experimental (RCT and quasi-experimental) or observational (cohort, case–control, cross-sectional) nature; 2. publication dates ranging from August 1985 to August 2023 (from the first publication on SDT to the end of data collection); 3. papers written in English; 4. studies grounded in SDT; 5. inclusion of body image and exercise, along with at least one of the following studied variables: interpersonal behavior, basic psychological needs, motivation, and eating behavior; 6. samples comprising exercisers in a gym/fitness context, with ages between 18 and 80 years; 7. emphasis on apparently healthy individuals (studies including overweight and/or obese individuals were also considered).

We implemented the following exclusion criteria: (1). studies published after August 2023; (2). studies involving amateur or professional athletes, as sports and physical exercise were considered distinct concepts [32]; (3). studies focused on physical education classes, as this type of physical activity differs from regular exercise. [32]; (4) instrument validation studies; (5) gray literature; (6) evaluation of physiological factors unrelated to previously mentioned variables; (7) systematic reviews, guidelines, protocol, comments, case reports, updates, statements, or consensus methods.

Data Extraction

We deliberately created a Microsoft Excel spreadsheet (Microsoft Corporation, Redmond, WA, USA) to facilitate data extraction, evaluate adherence to inclusion and exclusion criteria, and identify the chosen articles. Two authors (R.S.; R.R.G.) independently conducted registration and selection. In the event of any discrepancies regarding study eligibility, a meeting was convened between them, and discussions were held with a third author (D.M.) for resolution. All inclusion and exclusion criteria, as well as the PICOS strategy, were meticulously applied during this process. Adhering to this approach, the ex-

tracted information from the studies encompassed the following aspects: (1) bibliographic details (authors, publication year), (2) study design, (3) characteristics of the study sample, (4) evaluated outcomes, (5) primary findings, and (6) the statistical analysis conducted.

3. Results

3.1. Study Selection

Across all stages of the reviewing process, the eligibility of each paper was independently assessed by two reviewers. During the screening, 784 papers failed to meet the detailed inclusion criteria. During the eligibility review, 40 papers were excluded, and 6 studies were included within the review. A Microsoft Excel sheet (Microsoft Corporation, Redmon, WA, USA) was purposely designed and prepared to extract data, assess inclusion and exclusion criteria, and identify selected articles, where each one of the two reviewers classified every single paper. Whenever disagreements were noted, these were resolved by a third reviewer or through a consensus-based discussion, where reasons and criteria for exclusion were debated, detailed, and reviewed to capture possible patterns more accurately between the variables under study in the specific context of a gym or fitness center.

During our research (see Figure 1), we initially identified a total of 1373 titles. From this pool, 830 titles were chosen due to their potential relevance to this systematic review. After a thorough examination of the titles and abstracts, the selection was further refined to 46 articles, which were then subjected to comprehensive scrutiny. Subsequently, 40 studies that did not meet the eligibility criteria were excluded. The final sample was composed of six articles, which were all cross-sectional studies.

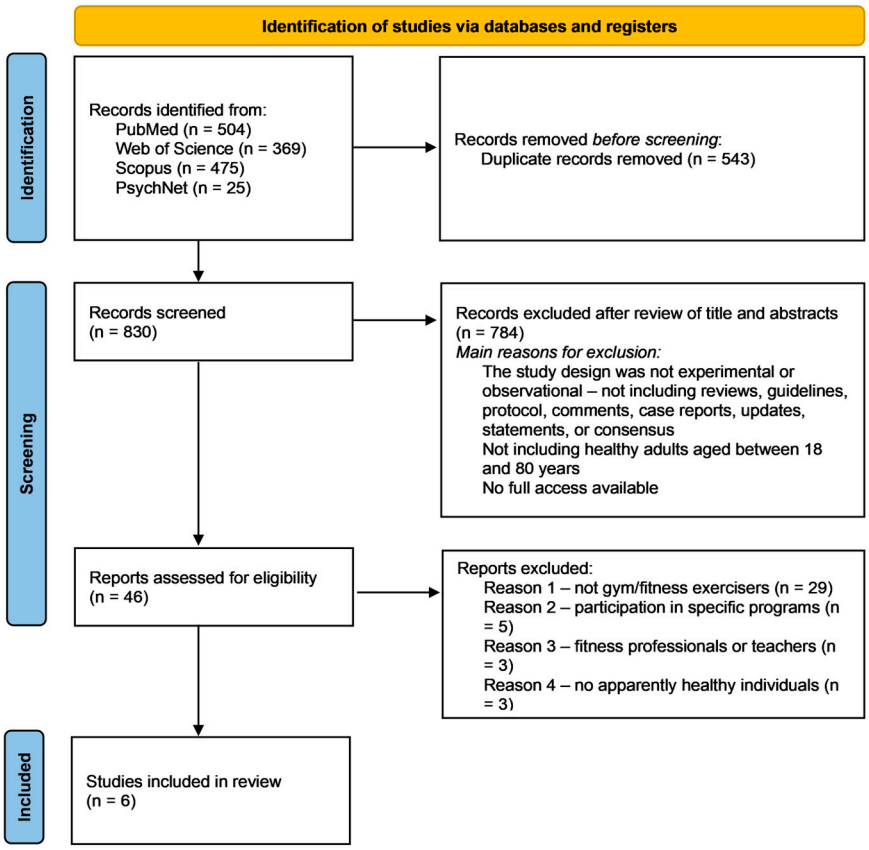

Figure 1. Study chart flow.

3.2. Study Summaries

The present review included six empirical studies published between 1985 and August 2023. All studies based on interpersonal behavior, basic psychological needs, motivation, and eating behavior in the body image and exercise domain were evaluated. Prospective,

experimental, and cross-sectional studies that examined interpersonal behavior, basic psychological needs, motivation, eating behavior, and their impact on or relation with body image in an exercise context were included. Table 1 presents a summary of all the included studies, listed by author's name organized alphabetically.

3.3. Characteristics of the Studies

The six studies included a total of six independent samples of regular exercisers in gym/fitness centers and controls. Most of the samples consisted of regular exercisers, with an extended age range (i.e., ages 18–80). This review included a total sample of 3.462 healthy exercisers and controls, predominantly female. For a more comprehensive approach, some of the main characteristics of the selected studies are described below, namely the samples, procedures used, limitations, and suggestions.

In the Caudwell et al. study [33], a total of 100 male participants with an age range of 18–68 years (30.40 $\pm$ 11.10 years) were recruited online and completed a questionnaire with different self-reported scales. This study has several potential limitations: it exclusively comprises male participants, which might have impacted their responses to body attitude measures. Additionally, the study employs a cross-sectional design and relies on self-reported scales. Future research could explore these factors more comprehensively by employing a prospective correlational or longitudinal design to investigate the influence of motivation and interpersonal behaviors on gym attendance and body image in both male and female exercisers over time.

The study by Halliwell et al. [34] had a total of 116 male participants (28.62 $\pm$ 5.12 years), who were recruited from gyms and in a train station and invited to fill out a questionnaire after exposure to images of muscular male models and then neutral images. The cross-sectional design, the sample with only male participant, a fairly broad classification of exercise behavior, and the lack of collected information about the specificity of exercise during their gym sessions could be considered limitations. Undoubtedly, these factors have the potential to impact the degree to which men perceive self-enhancement in reaction to media exposure, and such limitations should be considered in future studies. Additionally, it would be beneficial to explore the use of pre- and post-exposure assessments of satisfaction with different body areas.

Table 1. Summary of the characteristics of the included studies and outcomes extracted.

Author (et al.)/ Year/Country	Study Design	Sample Characteristics	Outcomes Assessed	Main Results	Statistical Analysis
Caudwell et al., 2016, Australia [33]	Cross-sectional	Male gym users; N = 100; M_{age} = 30.40 ± 11.10	M-IAT = implicit motivation (general); PLOCaut = perceived locus of causality—autonomous; PLOCcon = perceived locus of causality—controlled; GCOSaut = autonomy orientation; GCOScon = controlled orientation; MBASmus = male body attitudes scale—muscle; MBASBF = male body attitudes scale—body fat.	The average number of gym sessions per week among participants displayed a significant correlation with autonomous motivation as measured by PLOC. Moreover, there were significant correlations between male body attitudes pertaining to both muscle and body fat. Interestingly, there was no significant correlation observed between implicit motivation and the average number of gym sessions per week.	Descriptive statistics and correlations between study variables; Hierarchical regression analyses were conducted to assess the unique contribution of predictors to gym attendance.
Halliwell et al., 2007, UK [34]	Cross-sectional	Male gym users (N = 58) and non-exercisers (N = 58); N = 116; M_{age} = 28.62 ± 5.12	Body-focused anxiety; Muscularity-related exercise motivation; Exposure condition; Body Mass Index (BMI).	The impact of media exposure on gym users and non-exercising men differed in terms of their body-focused anxiety. In the non-exercising group, body-focused negative affect was higher after exposure to male models than to control images. In contrast, there was a tendency for gym users to report lower body-focused negative affect after exposure to models than to control images.	Body-focused negative affect was examined by a 2 (exposure condition) × 2 (gym user versus non-exerciser) ANCOVA, controlling for BMI; A stepwise hierarchical multiple regression analysis was conducted to examine whether exercising to increase strength and muscularity moderated the effects of exposure on body-focused affect.

Table 1. *Cont.*

Author (et al.)/ Year/Country	Study Design	Sample Characteristics	Outcomes Assessed	Main Results	Statistical Analysis
Mangweth-Matzek et al., 2022, Austria [35]	Cross-sectional	Male gym users; N = 307, M_{age} = 40.30 ± 17.70	Eating behavior and body image.	The three age groups differed significantly from each other by a striking decrease, showing the highest prevalence rates of eating disorder symptoms in the youngest group (14%) and lowest in the oldest group (2%). Regarding body image, most of the men were satisfied with their weight and shape. Comparison by age group revealed significant differences between all three groups, showing the middle-aged men as the most satisfied with weight and shape and most body-liking group compared with the youngest and the oldest, respectively.	Group comparisons via the Kruskal–Wallis test for ordinal and for continuous variables and the Chi-square test for categorical variables.
Neumark-Sztainer et al., 2011, USA [36]	Cross-sectional	Exercisers in yoga and Pilates mind–body activities and non-participants; N = 2287; M_{age} = 23.10 ± 0.70	Disordered eating behaviors and body dissatisfaction.	Among young women, disordered eating behaviors were prevalent among those engaging and not engaging in yoga or Pilates, with no differences between the groups. Young men engaging in yoga or Pilates were found to be at increased risk of unhealthy weight control behaviors, extreme weight control behaviors, and binge eating behaviors compared with non-participants.	Logistic regression was used to test the hypothesis that yoga/Pilates involvement was associated with disordered eating behaviors and body dissatisfaction.

Table 1. *Cont.*

Author (et al.)/ Year/Country	Study Design	Sample Characteristics	Outcomes Assessed	Main Results	Statistical Analysis
Prichard et al., 2008, Australia [37]	Cross-sectional	Female fitness class participants; N = 571, M_{age} = 35.99 ± 11.93	Body image outcomes: Self-objectification; Body esteem; Disordered eating; Reasons for exercise: Appearance-related; Health/fitness; Mood/enjoyment.	The duration of exercise within the fitness center environment demonstrated a stronger positive correlation with self-objectification and disordered eating, while displaying a more negative association with body esteem compared with exercise conducted outside of the fitness center. Cardiovascular exercise was, indeed, linked to heightened self-objectification, diminished body esteem, and a higher likelihood of experiencing disordered eating behaviors. In contrast, the amount of time spent engaging in weight-based exercise did not exhibit any significant associations with body image concerns.	Descriptive statistics were calculated for the study variables; Correlation coefficients for exercise type, body image measures, and reasons for exercise; Hierarchical multiple regression analyses assessing reasons for exercise as a mediator between exercise type and self-objectification, body esteem, and disordered eating.
Vinkers et al., 2012, Netherlands [38]	Cross-sectional	Women fitness center users; N = 81, M_{age} = 32.88 ± 9.86	Body esteem; eating disorder symptomatology; exercise motives.	Appearance-motivated exercise partially mediated the link between low body esteem and eating disorder symptomatology. In contrast, health-motivated exercise was unrelated to both body esteem and eating disorder symptomatology.	Descriptive statistics were calculated for the study variables; Correlations between motives for exercise, body esteem, and eating disorder symptomatology; Multiple regression analysis with motives for exercise as predictors for eating disorder symptomatology.

The study by Mangweth-Matzek et al. [35] presented 652 male participants from two fitness centers, aged 18–80 years (40.30 ± 17.70 years), who completed a questionnaire to collect data about exercise dependence and addiction and eating disorders. The participation rate of this study was 46%, raising the possibility of non-response bias and selection bias, respectively. Because eating disorders are frequently concealed, individuals with disordered eating behaviors might have been less inclined to participate compared with those without such issues, potentially leading to an underestimation of the actual prevalence. Conversely, individuals dealing with both disordered eating and excessive exercise could exhibit characteristics like hyperactivity and impulsivity, which might contribute to their reluctance to participate in the study. In future studies, it will be important to consider including female participants in the sample, since eating disorders are still considered typically feminine behaviors. In this way, it would be possible to compare the results regarding exercise dependence and eating disorders between the genders.

The study by Neumark-Sztainer et al. [36] included 1.030 young men and 1.257 young women (25.30 ± 1.70 years) who participated in a project about eating and activity. The project survey has been used in previous studies, and it was modified to increase the relevance of items for young adults. Additionally, a greater focus was placed on physical activity than in previous waves, and questions on specific activities were added to the survey. Study limitations include the cross-sectional nature of the study, the use of self-reported measures, and the lack of information on types of practices or locations (e.g., yoga studios compared with fitness centers). Experimental studies are needed to understand the influence of the types of practices and the surrounding environment on eating behaviors and body dissatisfaction.

The Prichard et al. study [37] involved a sample of 571 female fitness class participants, spanning ages from 18 to 71 years (with an average age of 35.99 ± 11.93 years). The study assessed exercise motivations, self-objectification, body esteem, and disordered eating symptomatology using a questionnaire. It is worth noting that the questionnaire return rate could be considered a potential limitation. The 51% of women who returned their questionnaires might differ in some aspects from those who chose not to participate, possibly underrepresenting the prevalence of eating and weight concerns within fitness centers. Another limitation is the study's exclusive focus on female participants, which precludes gender comparisons. To gain deeper insights into these relationships, future research should incorporate prospective and experimental designs. It is crucial to explore whether individuals, both women and men, who frequent fitness centers enter with pre-existing self-objectification tendencies or if the fitness environment itself fosters self-objectification and its associated negative outcomes. Lastly, in the study by Vinkers et al. [38], 81 women aged 17–50 years (32.88 ± 9.86 years) were recruited from fitness centers to fill out a questionnaire about body esteem, eating disorder symptomatology, and exercise motives. The cross-sectional correlational design does not allow for any conclusions about the direction of causality of the variables, and the small and female-exclusive sample might be considered a limitation. Therefore, future studies should employ a longitudinal design to understand causes and effects, with a larger sample and involving male participants.

4. Discussion

The primary objective of this review was to scrutinize the literature in order to identify and establish patterns regarding the relationship between the variables under study: interpersonal behavior, basic psychological needs, motivation, eating behavior, and their impact on or relation with body image in exercise in gym/fitness contexts.

Examining the different articles included in this study, it is possible to conclude that research about the variables mentioned before and body image in the gym/fitness context seems to be lacking. As a matter of fact, only 2 (33%) of the analyzed articles were written in the last 10 years (>2013), while the remaining ones were written previously (2007–2012). That being said, this systematic review proposes an updated summary of investigations on

this topic that have been conducted up until now, aiming to complement and enhance the previously existing review [26].

An analysis and discussion of the selected studies grouped by the variables and their relationship with body image, namely, interpersonal behaviors and body image, basic psychological needs, motivation, body image and eating behavior, and body image, is provided.

Interpersonal behaviors and body image

None of the selected studies address the influence of physical exercise coaches on practitioners' behavior, nor the influence of interpersonal relationships on their perception of body image. This is a topic that should be specifically investigated in the context of gym/fitness center users and fitness professionals. Just recently, Rodrigues et al. [39] introduced and validated the Interpersonal Behavior Questionnaire (IBQ) and the Interpersonal Behavior Questionnaire—Self (IBQ-Self) in the context of exercise. These scales were designed to assess exercisers' perceptions of instructors' behaviors and instructors' self-perceptions of their behaviors, respectively. This development addresses a gap in research that has previously been limited in analyzing the dimensions of support and thwarting in interpersonal behaviors. Indeed, it is known that fitness instructors play a relevant role in terms of supporting autonomy, competence, and relationships [39] when they offer positive feedback. Thus, the fitness instructors' interpersonal behaviors can be predictive of the satisfaction of the practitioners' basic needs and the regulation of their motivation [21]. However, regarding the specific perception of body image, the selected studies do not provide information on the influence of these interpersonal relationships.

Basic psychological needs, motivation, and body image

As previously mentioned, the satisfaction of basic psychological needs leads to autonomous behavior if the socio-environmental context promotes their satisfaction and/or support [14]. Individuals who experience frustration of their basic psychological needs are more likely to develop higher levels of controlled motivation in each activity, which is considered harmful to the persistence and adherence to the activity, as it promotes negative results [18].

Three of the selected articles directly or indirectly address issues related to the satisfaction of basic psychological needs, motivation, and body image. In fact, it is possible to verify that the average frequency of exercise is associated with more autonomous forms of motivation and even greater satisfaction with body image, which presuppose greater satisfaction of basic psychological needs [36]. On the other hand, exercising in gyms seems to offer greater support regarding acceptance and satisfaction with body image when compared with sedentary individuals in relation to the exposure to images of ideal models by the media [37]. This fact may be related to a greater satisfaction of basic psychological needs, particularly in terms of autonomy and competence. Indeed, exercise motivated by improving one's appearance, which can be associated with more controlled forms of motivation, will be associated with higher levels of dissatisfaction with body image. Conversely, a practice oriented towards health and well-being is based on more autonomous levels of motivation and translates into higher levels of satisfaction with body image, which allows for greater satisfaction of basic psychological needs [38]. An excessive emphasis on body image and ideal role models in the context of exercise, as well as in the social context in general, may lead to greater frustration of basic psychological needs, as well as less self-determined forms of motivation for exercise and healthy behaviors. Hence, individuals with higher levels of self-determined motivation for exercise are more likely to sustain their behavior and exhibit greater persistence in their exercise regimen over time [5].

Eating behavior and body image

Research supports the hypothesis of motivational transfer between self-determined motivations to exercise and regulate eating in adults with normal weight, suggesting that more physically active individuals have greater self-determined motivations to exercise and

regulate eating [25]. However, it is important to understand how the perception of body image influences the regulation of eating behavior in the context of exercise practitioners in gyms, considering this specific context. As mentioned earlier, the motivation for exercise driven by appearance partially served as a mediator in the relationship between low body esteem and eating disorder symptomatology. Conversely, exercise motivated by health considerations showed no significant associations with either body esteem or eating disorder symptomatology [39]. Additionally, the duration of exercise within the gym/fitness center was discovered to have a stronger positive correlation with self-objectification and disordered eating, while exhibiting a more negative association with body esteem compared with exercise undertaken outside of the gym/fitness center environment [39]. This demonstrates the importance of creating practice environments that avoid body objectification, as well as the excessive valuation and association of the ideal body along with exercise. On the other hand, instructors and exercise professionals should reinforce and support behaviors aimed at health and well-being, as opposed to results and objectives associated with body image. It will also be important to consider the demystification associated with certain types of exercise and their relationship with weight loss and body image. Certainly, among many practitioners, engaging in cardio-based exercise appears to be linked to heightened self-objectification, reduced body esteem, and a higher likelihood of experiencing disordered eating behaviors. Conversely, the amount of time devoted to various forms of weight-based exercise did not exhibit a significant association with concerns related to body image [39]. It is also very important to pay special attention to younger practitioners. Apparently, younger practitioners are more likely to develop more unregulated behaviors in their diet due to the greater pressure felt in terms of their body image when compared with older practitioners [39]. This type of binge eating behavior and seeking to control weight in an unhealthy way is not only seen in relation to older exercisers, but also in relation to non-practitioners [36].

The obsession with the cult of the body and ideal body image may indicate that exercise will be performed in a less self-determined way and in a more controlled way in the face of extrinsic factors, accompanied by the choice of less healthy eating behaviors. To reduce these possibilities, both physical exercise coaches and gyms must provide behaviors and strategies to support the practice of exercise in a balanced way and with the health and well-being of practitioners as the main objective, improving the adherence and maintenance of the recommended exercise regimens, as well as the adoption of a healthy lifestyle, which includes a balanced eating behavior.

5. Limitations

Some limitations that might influence data interpretation were noted. Considering the inclusion and exclusion criteria and the PICOS strategy, the authors recognize that the number of results obtained is a limitation of the present study. Therefore, we recommend that future studies in this type of population can encompass the combination of all variables. The selected studies used different instruments to assess the variables under study, based on different conceptions, which could limit the comparison between the different results and outcomes. On the other hand, the specific context of exercise in gyms and fitness centers leads to a smaller number of eligible studies, considering possible limitations in access to practitioners. Another limitation is the fact that all selected studies were cross-sectional and not longitudinal. We recommend that future research explores the impact of interpersonal relationships, basic psychological needs, and motivation on the development of body image perception and eating behaviors. Additionally, we encourage more in-depth analysis, such as systematic reviews and meta-analyses, of clinical trials conducted with this population or with individuals with chronic diseases. Such investigations have the potential to enhance our understanding of how exercise-related behavioral outcomes can contribute to improvements in health indicators.

6. Conclusions

This review aims to find and determine a pattern between the variables under study in a gym/fitness context specifically, considering if body image perception has a determinant factor. In fact, there is evidence that perception and dissatisfaction with body image leads to less self-determined forms of motivation for exercise in the context of gyms and fitness centers, as well as a possible lower satisfaction of basic psychological needs. On the other hand, a negative perception of body image can also lead to less regulated forms of exercise, as well as less healthy eating behaviors. Considering the focus on improving body image, influenced by models idealized by the media and the social context, exercisers present more controlled forms of motivation and tend to adopt behaviors not aimed at improving health and well-being. Given the results, it is suggested that new communication strategies be adopted within the gyms themselves, namely the use of more comprehensive body image references that are not so athletically stereotypical. Here, the interpersonal relationship with fitness professionals may play a key role, as they may exhibit supportive behaviors that value exercise mainly for its benefits in relation to health and well-being, as opposed to its relationship with body image. In this way, exercisers will be able to experience more self-determined forms of practice, leading to a more harmonious relationship with their body and more persistence with exercise. Sustainability in the fitness industry goes beyond eco-friendly equipment and practices; it also extends to the interpersonal behaviors of fitness instructors. By promoting sustainable choices and fostering positive, respectful relationships with clients, fitness instructors can contribute to a more sustainable fitness journey that benefits both individuals and the planet. Embracing sustainability as a holistic approach can lead to healthier bodies and a healthier world.

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