

# PHYSICAL ACTIVITY VALUATION: A **DISCUSSION ON AN IDENTIFIED IDEA NOT** CONTEXTUALIZED IN THE LITERATURE

VALORAÇÃO DA ATIVIDADE FÍSICA: DISCUSSÃO SOBRE UMA IDEIA IDENTIFICADA MAS NÃO CONTEXTUALIZADA NA LITERATURA 👶

EVALUACIÓN DE LA ACTIVIDAD FÍSICA: DISCUSIÓN SOBRE UNA IDEA IDENTIFICADA PERO NO CONTEXTUALIZADA EN LA LITERATURA 🔏

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Abstract: The valuation of physical activity has not yet been established as a concept or definition in the literature. Thus, the objective of the present study was to understand the concept and foster a preliminary discussion about the valuation of physical activity, through a systematic literature review followed by an integrative review with different search strategies. Considering the systematic review inclusion criteria, studies addressing the concept or definition of physical activity valuation were not identified. However, from the selection and reading of the articles in the integrative review, we sought to understand in which contexts the studies about physical activity valuation methods were developed. It is suggested that the valuation of physical activity is associated with the importance given by the individuals to physical activity, i.e. a broad concept related to value judgment regarding physical activity; the valuation of physical activity can be related to the hedonic pricing, the contingent valuation, and the avoided costs.

**Keywords:** Concept formation. Decision making. Attitude. Judgement.

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## 1 INTRODUCTION<sup>1</sup>

The regular practice of physical activity (PA) is directly associated with health and is strongly related to well-being, life quality, and the prevention of several chronic health conditions, such as cardiovascular and respiratory diseases, some types of cancer, and diabetes (MARKER; STEELE; NOSER, 2018; PUCIATO; BORYSIUK; ROZPARA, 2017; SILVA et al., 2017; WHO, 2018). The adoption of an active lifestyle can bring numerous benefits related to physical and mental health, even when individuals have difficulty reaching the current recommendations (BRASIL, 2021a; WARBURTON; BREDIN, 2017).

The health benefits provided by PA practice are widely known, however, part of the population has not incorporated PA practice as a usual behavior. In Brazil, only 36,8% of the adult population meets the PA recommendations in leisure time and is considered physically active (BRASIL, 2021b). These are concerning data, since they suggest that individuals choose activities that do not include body movement in their leisure time.

It is known that the choice process is associated with motivation, and when motives negatively interfere with decision-making, they are considered barriers. The choices regarding a particular behavior in leisure time are directly associated with identified barriers (SALLIS; OWEN, 1998), and in this perspective, the lack of time is the most prevalent that directly interferes with the decision regarding PA practice (VIEIRA; SILVA, 2019). However, the literature reports that 63.3% of Brazilian people spend three or more hours a day on screen activities (e.g., television, computer, tablet, or cell phone) (BRASIL, 2019, p. 19). Such findings demonstrate that PA is not prevalent in leisure time; despite realizing that the "time" exists. Consequently, this barrier could be overcome, which does not happen through opportunities (or lack of opportunities), choices, and preferences in the individual decision-making process.

From this divergent perspective, studying and understanding the entire context involved in the issue of PA, including analyzing the factors inherent to individuals who adhere to and those who do not adhere to this behavior, is an important tool for understanding decision-making related to individual choices. These factors include valuation, which can be understood as determining the importance of something, for example, PA, in a personal and subjective way (NOGUEIRA; MEDEIROS; ARRUDA, 2000).

The primary concept of the term valuation is associated with economy, with monetary value. However, beyond the economic meaning/ understanding of the word, the term "valuation" also regards the act of valuing or determining the importance of something. The valuation concept is used in different areas, for example, in the environmental context (LYNCH; SPENCER; EDWARDS, 2020; NOGUEIRA; MEDEIROS; ARRUDA, 2000; SILVA; LIMA, 2004), programs valuation (FEITOSA et

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al., 2016), and also in the health area (ALVES et al., 2016; LEME et al., 2017; SILVA; SILVA; PEREIRA, 2016). Thus, the concept is somehow related to the importance of something based on individual behaviors, perceptions, and choices.

In order to contribute to the problem of physical inactivity and the understanding of the subjects' choices regarding the regular practice of PA, based on its importance, the idea of physical activity valuation (PAV) emerges. Given the lack of information on the issue of valuation in the context of PA, this study aims to understand the concept and encourage a preliminary discussion about PAV, through integrative and systematic literature reviews.

#### 2 METHODOLOGY

The present study is a theoretical literature review using different search strategies in the context of PAV. Initially, a systematic review was conducted (phase 1) with the aim of searching for studies to specifically understand the concept or definition of PAV. Subsequently, an integrative review was conducted (phase 2) with the aim of contextualizing the PAV scenarios, exploring themes related to types of valuation, and searching for concepts or definitions.

# 2.1 SYSTEMATIC LITERATURE REVIEW (PHASE 1)

The search for understanding the concept of PAV was planned to occur based on a systematic literature review. The databases Pubmed, Science Direct, World Wide Science, Scielo, Biblioteca Virtual em Saúde, Portal de Periódicos CAPES, and Google Scholar were used. The following terms were crossed: valuation, physical activity, and exercise. The searches in the databases were arranged in such a way that the terms valuation and, concomitantly, one of the terms physical activity or exercise were always present, using the boolean operator AND in order to combine the terms.

The search was conducted between June 1st and August 5th, 2020, considering the following inclusion criteria: article published in full; year of publication in the last ten years (2010 to 2020); publication in Portuguese or English; articles addressing the theme of PAV or physical exercise as a concept, definition or objective of study, or related to the monetary value of PA. Duplicate articles were excluded using the Zotero® program. The analysis and selection of articles were carried out in 3 stages: 1- reading of titles; 2- reading of abstracts; 3- full reading. All phases were carried out by pairs of reviewers, individually and blindly. Discrepancies were analyzed and resolved by a third reviewer, also blindly.

# 2.2 INTEGRATIVE LITERATURE REVIEW (PHASE 2)

The search for the contextualization of the PAV was planned to occur based on a systematic literature review, and it was necessary to subsequently organize a new search methodology in the form of an integrative review. This type of review was chosen because it aims to analyze the ideas and concepts available, not to analyze parts and results of an article. The reviewer's voice is used for analysis to understand concepts and contexts (KHOO; JIN-CHEON; JAIDKA, 2011).

This phase was organized based on the full reading of the 10 articles included to read the abstract in the systematic review, where new terms were identified. These terms were chosen both due to their recurrence in several studies and their thematic relevance. Because of this, new search strategies were developed in the search stage of the integrative review, aiming to find studies that dealt with topics related to PAV. At this stage, the same inclusion and exclusion criteria for duplication of the systematic search were considered.

Due to the search in the 2nd phase having multiple terms, it was carried out in the Pubmed database. This database was selected because it has an extensive bibliographic collection in the biomedical area, indexing of the main databases, and because it is considered a reference search engine (WILLIAMSON; MINTER, 2019).

The searches in the three stages of the integrative review and the selection of studies included for full reading were carried out by 1 researcher, between the period from August 6th to October 29th, 2020.

## 3 RESULTS

This study was initially planned to take place in the format of a systematic literature review, however, after its completion, it was not possible to achieve the proposed objective. Thus, the need to carry out an integrative review was identified to contextualize and conceptualize the PAV.

Through the systematic review search process, after excluding duplicates, 162 articles were found. After reading the titles, 115 were excluded by the pair of reviewers as they were not related to the objective of the present study, and 26 articles were selected for reading the abstract. After reading the abstract, 15 articles were excluded because they were not related to the approach to PAV or physical exercise as a concept, definition, or study objective. Thus, 11 articles were included for full reading. and, of these, 1 article was excluded as it was not found in full. The results of the literature review stages are presented in Figure 1.

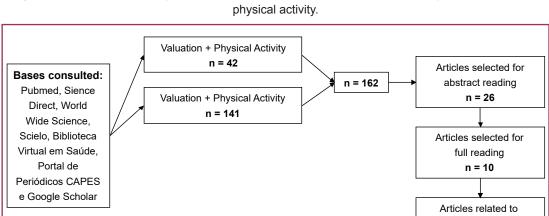


Figure 1 - Flowchart of the systematic review carried out for the theoretical study of the valuation of

Source: Authors' elaboration

PAV concept n = 00

Data from the 10 articles included for full reading are outlined in Table 1.

Table 1 - Information of articles included, in the last phase of the systematic review for the theoretical study of the Valuation of Physical Activity.

Authors	Year and country	Objective of the study	Concept/idea related to valuation
ALBELWI; ROGERS; KUBIS	2019 United Kingdom	Evaluate exercise as a reward.	Valuing exercise with monetary reward.
CHEVAL, B. et al.	2019	Investigate the effect of energy expenditure on reward-related brain activity.	Valuing reward through energy expenditure.
COCHRANE et al.	2019 **	Analyze the cost-benefit of preventive interventions aimed at physically inactive individuals.	Systematic review related to the cost-benefit of being active.
HAGBERG; LINDHOLM.	2010	Describe how to measure the costs of time spent in physical activity.	Value and cost of the time spent in physical exercise.
HAGBERG; LUNDQVIST; LINDHOLM.	2020 Sweden	Estimate the cost of time spent in exercise among primary health care patients with metabolic risk factors who receive prescribed physical activity.	Cost of time spent in physical exercise.
HSU; BLANDFORD	2014 United Kingdom and United States	Understand the rewards and costs surrounding individuals' weight control behaviors by uncovering opportunities for weight control technologies.	Cost-reward assessment and valuation.
HUNTER et al.	2018 Northern Ireland	Evaluate the effectiveness and cost- benefit of an intervention based on a loyalty scheme, involving rewards to increase physical activity in public sector employees.	Valuing physical activity through rewards.
RODRIGUES et al.	2020 Portugal	Estimate the economic and health benefits for the adult population of the modal shift from driving to active travel in urban environments.	Valuing active transport by reducing public health costs.
ROMÉ et al.	2010 Sweden	Estimate the willingness to pay for health improvements among participants in the "Physical Activity with Prescription" program.	Valuing time and physical activity.
WOLFENSTETTER	2011	Develop a conceptual economic evaluation framework based on the effectiveness of physical activity, standard economic evaluation methods, and public health objectives.	Concepts related to the economic evaluation of physical activity interventions.

Source: Authors' elaboration Legend: \* = not identified; \*\* = review article

Although the included studies related to the valuation methodology in the context of PA or physical exercise, none of them addressed the idea of PAV as a concept or study objective. Therefore, its idea to enable such understanding was not discussed. Therefore, in the first phase of searches, no studies were found that would enable the conceptualization and contextualization of PAV.

A content analysis was developed after fully reading the 10 articles included in the systematic review. This "[...] is intended to classify and categorize any type of content, reducing its characteristics to key elements [...]" (CARLOMAGNO; ROCHA, 2016).

Therefore, specific rules were adopted for reading the articles: terms were selected that presented redundancy in the articles, and that were related to the definition of valuation in other themes or that were related to PA or physical exercise. After a thorough reading and adopting the criteria above, some were selected. Thus, there was a need to understand these terms through an integrative review. The terms raised in each of the articles are presented in Table 2.

Table 2 - Important terms observed in the articles included in the systematic review, in the full reading stage.

Author	Year	Important terms	
ALBELWI; ROGERS; KUBIS	2019	<ul><li> Valuing the exercise</li><li> Willingness to pay</li><li> Hedonism</li></ul>	<ul><li> Economic valuation</li><li> Delay discount</li><li> Reward</li></ul>
CHEVAL, B. et al.	2019	Valuation and energy cost	Reward     Behavior
COCHRANE et al.	2019	Economic assessment     Public health	Economic methods in health
HAGBERG; LINDHOLM.	2010	Valuing the exercise	Valuation of time     Cost effectiveness
HAGBERG; LUNDQVIST; LINDHOLM.	2020	<ul><li>Cost benefit</li><li>Cost effectiveness</li><li>Willingness to pay</li></ul>	Physical activity for pleasure     Economic valuation
HSU; BLANDFORD	2014	<ul><li>Hedonic cost</li><li>Delay discount</li><li>Reward</li></ul>	Decision make     Behavior
HUNTER et al.	2018	<ul><li> Valuing the physical activity</li><li> Contingent valuation</li><li> Economic assessment</li></ul>	<ul><li>Reward</li><li>Cost benefit</li><li>Cost effectiveness</li><li>Behavior</li></ul>
RODRIGUES et al.	2020	<ul><li> Economic assessment</li><li> Willingness to pay</li><li> Avoided cost</li></ul>	Public policy     Behavior
ROMÉ et al.	2010	<ul><li>Willingness to pay</li><li>Economic assessment</li><li>Contingent valuation</li></ul>	Behavior     Public health
WOLFENSTETTER	2011	Economic assessment     Cost	Behavior     Public policy

Source: Authors' elaboration

The researchers analyzed the terms, searched for and analyzed their definitions, based on content analysis, and selected those that directed valuation and PA, so that they could try to understand PAV. The terms included in the search stage of the integrative review were hedonic cost, avoided cost, contingent valuation, reward for healthy behavior, behavioral economics, and public policies, with the word nudge being added to the latter in order to refine the study.

The search for articles in the integrative review took place based on the selected terms. Thus, 1383 were found related to hedonic cost, 416 to avoided cost, 20 to contingent valuation, 190 to rewards for healthy behavior, 408 to behavioral economics, and 16 to nudge-type public policies, totaling 2433 articles found in the second phase. These articles were initially selected by reading the title, where they should present a relationship between the respective term and PA. Subsequently, the abstract was read using the same criteria and 26 articles were selected for full reading and used in this study. The complete description of the integrative review can be found in Figure 2.

During the reading of the studies in full, both in the systematic and integrative review articles, types of valuation and contexts related to PAV were identified, making it possible to understand its concept and discuss its contextualization.

Articles selected to full Phase 1: Sistematic Selection of commor terms Articles selected by Articles selected Articles found in the Inclusion of news reading the title and after reading in <u>search:</u> n = 2433 search strategies

Figure 2 - Descriptive flowchart of the systematic and integrative reviews, developed for the theoretical study of the Valuation of Physical Activity.

Source: Authors' elaboration

n = 49

n = 08

n = 07

**n =** 12

n = 08

**n** = 04

n = 02

Phase 2: Integrative

• Pubmed

Avoided cost: n = 416 Contingent valuation: n = 20

· Reard for healthy behavior: n = 190

Behavioral economics n = 408

• Public polices Nudge: n = 16

## 4 ANALYSIS

From the reading of studies, it was found that PAV is identified as a result of choices related to PA (ALBELWI; ROGERS; KUBIS, 2019; LYNCH; LONGO; HUTCHINSON, 2011) however conceptually its contextualization and importance were not identified. It was also found that some terms and concepts present in the studies could guide the understanding of the PAV idea. The entire review process, whether systematic or integrative, made it possible to create a theoretical foundation targeted at understanding the idea and contextualizing the PAV.

## 4.1 PHYSICAL ACTIVITY VALUATION: TYPES OF VALUATION

To start the contextualization of PAV, it is fundamental to understand the term "valuation". According to the dictionary, the word valuation has the meaning "action of assigning value to; value judgment; the act of valuing, determining the importance, quality, price of something" (VALORAÇÃO, 2018). In the environmental area, the economic valuation is consolidated. According to Pearce (1993), "the environmental economic valuation methods are used to estimate the values people assign to environmental resources based on their individual preferences". Nogueira, Medeiros e Arruda (2000) add that "considering their taste and preferences, each individual will have a set of preferences that will be used in the valuation of any and all goods or services, including environmental ones".

Thus, it can be inferred that valuation is related to a value judgment that the subject attributes to something, based on their individual preferences. Moreover, it is possible to observe that the terms used in the economy are directly associated with valuation. From the types of valuation reported in the literature, three are correlated and can be applied to PAV: hedonic cost, avoided cost, and contingent valuation.

In economy, the term "cost/hedonic pricing" refers to the relation between the qualities of a product and its price in the market (costs versus quality). For example: when buying a property, all its infrastructure and the local and environmental characteristics are observed, which awaken the buyer's desire to purchase. Therefore, the individual "values" all the particularities of the property and not just its structural part (NOGUEIRA; MEDEIROS; ARRUDA, 2000). This refers to hedonism, which can be defined as the search for pleasure, and, consequently, avoiding unpleasure (EKKEKAKIS; DAFERMOS, 2012).

The term hedonism is used in several contexts, in psychology for example, pleasure and the search for it is one of the main motivations in human behavior (MURPHY; EAVES, 2016; VEENHOVEN, 2003). In the PAV context, the hedonic cost can be understood as the perception of the "meaning/reason/motivation" of the practice related to the sensation of pleasure that PA can provide to the individual and, based on this, PA has greater importance for the practitioner. Consequently, also a higher valuation or "willingness to pay".

Evidence suggests that the pleasure or displeasure experienced during exercise can influence subsequent physical activity. Physical inactivity may result from a conflict between positively evaluated information about health benefits and unpleasant affective experiences (EKKEKAKIS; PARFITT; PETRUZZELLO, 2011). Studies showed that the relationship between regular PA practice and pleasure is associated with the intensity in which the exercise is performed, and, when the practice is self-paced, it provides a greater sensation of pleasure, resulting in a positive experience (EKKEKAKIS; PARFITT; PETRUZZELLO, 2011).

In the economy, the term avoided cost refers to a "preventive cost" or "defensive cost" to avoid further costs. For example, buy mineral water and/or boil running tap water to avoid contamination by the water supplied to the population. Thus, "preventive expenses" (the cost of purchasing bottled water or the cost of boiling tap water) are valued together in order to encompass all possible expenses incurred by the individual to protect their health and the consequences inherent to contracting a disease (cost of medical expenses) (NOGUEIRA; MEDEIROS; ARRUDA, 2000).

In the context of PAV, the avoided cost refers to when the apparently healthy individuals adhere to a PA routine to avoid further health problems caused by physical inactivity (HUMPHREYS; MCLEOD; RUSESKI, 2014), i.e., from a perspective of promoting good health and preventing diseases. It is known that physical inactivity is proven to be costly to health as it triggers illnesses and is responsible for high hospital, medication, and medical consultation costs. The amount spent with the physically inactive population and affected by chronic diseases, currently represents one of the main public health expenses (BUENO et al., 2016). In this sense, PA programs are offered to the population as part of primary care attention (GOMES et al., 2014). In these programs, the participants who present health problems and adhere to regular PA practice generate higher costs to the system in comparison with the apparently healthy ones (CODOGNO; FERNANDES; MONTEIRO, 2012). Such costs are associated with physician consultations, medications, and health procedures. Thus, regular PA practice is more advantageous from the perspective of avoided costs.

In the economy area, the "contingent valuation" method considers how much an individual is willing to pay (cost) to receive something (benefits). In Brazil, for example, some studies used the contingent valuation to determine people's willingness to pay for the conservation and maintenance of an environmental asset or service, such as the immediate restoration of electric power in a Brazilian state (SILVA JÚNIOR et al., 2017), the depollution of a river (TAVARES; FONSECA, 2017), and the maintenance and conservation of park services (SILVA; LIMA, 2004).

Similarly, the contingent valuation, within the context of PAV, can be related when the individual adheres to regular PA practice exclusively to obtain benefits considering the "willingness to pay" for them. The willingness to monetarily pay, for example, for health improvements among individuals who practice PA is influenced by their income, educational background, and body mass index (ROMÉ et al., 2010).

The contingent valuation seems to be more commonly identified in adherence aspects, since people usually start practicing PA when their health has already been affected. This can influence the maintenance of PA practice, considering that, in the presence of health conditions, the perceived benefits are more immediate, which was demonstrated in a study on hypertension (PESCATELLO et al., 2019). A study enrolling more than 1,000 participants of PA programs in primary care, found that the motive "have a better health condition" was reported by more than half participants, and the most reported barrier for PA practice was "current health condition" (SILVA et al., 2020), highlighting the search for benefits, that is, the contingent valuation of AF.

In the study by Matias and Andrade (2018), analyzed from the perspective of the concepts described above, it is possible to visualize, very clearly, the context of hedonism, avoided cost, and contingent valuation. The authors reported that many people practice PA considering only the benefits, disregarding the intentions and pleasure, and how the pleasure is important for PA practice. The relation between PA and psychological well-being is fundamental, the pleasant feelings towards exercise (how they are interesting, challenging, and pleasant) explain why people adhere to PA and keep on practicing it. Still, the authors state that regular PA practice tends to be motivated extrinsically, supported by a particular gain (or profit, avoided cost) or reward (contingent valuation) for being engaged in PA to be healthy, in good shape, or able to perform other activities (MATIAS; ANDRADE, 2018).

Among the studies found in the searches, a preamble by Lynch et al. (LYNCH; LONGO; HUTCHINSON, 2011) stands out. The authors reported that PA was valued in a hypothetical situation where the individual could choose between taking a hypothetic medicine pill that would bring the same benefits as PA practice, or performing PA, and 97% of the participants chose to perform PA. The researchers expected the participants to choose the pill to avoid wasting time practicing PA; however, the results opposed their expectations. The final publication of this study was not found, even after contacting the authors. Therefore, it was not possible to verify how the initial hypothesis was refuted, nor do we understand the contextualization of the PAV process.

## 4.2 VALUATION OF PHYSICAL ACTIVITY AND THE BEHAVIORAL ECONOMY

Behavioral economics, according to Samson (2015), is "the study of the cognitive, social, and emotional influences observed on people's economic behavior". Within behavioral economics, it is pointed out that individuals' choices are not based on reason – a mix of costs, benefits, and pre-existing preferences. This relates to the PAV context. Other factors, such as feelings, for example, can influence decisionmaking and can be induced or modified so that the choices are predictable and aimed at real needs (AVILA; BIANCHI, 2015; LOCH et al., 2019).

This knowledge has been introduced in different contexts, including public policies (ÁVILA; BIANCHI, 2015). In the United Kingdom, for example, the use of economic behavior while public policy emerged with the formation of teams specialized in behavioral sciences to organize actions to stimulate desirable behaviors without restricting individual choices. This type of intervention is called nudge, where the government influences the individuals in their decision-making, without intimidation or significant changes (BENARTZI et al., 2017). The "nudge" changes the "architecture of choice", it is like a "push", providing other incentives that oppose previous policies based on regulation, prohibitions, or economic incentives (penalties and subsidies). It is a public strategy that presents lower costs in comparison with the traditional ones (BENARTZI et al., 2017). Nudge programs represent a way to stimulate motivation and valuation of healthy behaviors, they can trigger substantial changes in the population's choices, allowing them to be included in the individuals' routine.

It is evidenced in the literature, that some strategies to improve the control of diabetes and NCDs [chronic non-communicable diseases] in general (KWAN et al., 2020), such as self-management in the form of tickets, notifications, incentives, and feedback, have effected positive (MÖLLENKAMP; ZEPPERNICK; SCHREYÖGG, 2019). In the PA context, aiming to discourage sedentary behavior, the nudge is a technique that allows a change in the architecture of choice. For example, use the stairs rather than the escalator; however, when the intervention is over, the efficacy of the intervention decreases. This can occur because the behavior did not turn into a habit (LANDAIS et al., 2020). Nudge interventions need to bring meaning to the performance of behavior, in contrast to the idea that habit refers to automatic behavior stimulated by external stimuli and governed by unconscious cognitive processes (COHN; LYNCH, 2017).

Behavioral economics in public policies can be a strategy used within the scope of PA so that people have the consequent benefits and begin to perceive them and identify their importance, triggering PAV. Traditional approaches to modifying healthrelated culture commonly attempt to change people's behaviors and generally involve attempts to demonstrate that these behaviors are individual decisions that should be chosen (VOLPP; ASCH, 2017).

Personal changes are complex and the behavioral economy seeks to show people the direction of healthy habits, helping to reformulate the context so that existing behavioral patterns change and promote healthy habits. Within the scope of PA, it is possible that this can be achieved, for example, through changes in physical environments, dissemination, implementation methodology, and the choice of available interventions. This is done so that the healthy choice is the easiest and most pleasurable (VOLPP; ASCH, 2017).

#### 4.3 VALUATION OF PHYSICAL ACTIVITY THROUGH REWARD

The present literature review did not identify studies investigating PAV effectively as an object of study or bringing reflections on the concept. Only two studies reported that PA was valued or valorized in some particular situations (ALBELWI; ROGERS; KUBIS, 2019; LYNCH; LONGO; HUTCHINSON, 2011).

From the reviews, it was found that it is usual studies associating any type of reward with stimulating healthy behaviors; are commonly found and used to stimulate valuation (PATEL et al., 2016; SWALUW et al., 2018; VOLPP et al., 2008; YANCY JR et al., 2018).

In these studies, different contexts and resources can be identified: for body mass loss, for example, there are studies with monetary rewards to stimulate PA practice (PATEL et al., 2016) or rewards using daily active controls via text message compared to financial rewards (YANCY JR et al., 2018). Both studies regard the rewards as inefficient, since the behavior can be modified when the stimuli cease. Therefore, stimuli for behavioral changes must be allied with the reward, allowing the development of habits along with the pleasure of practicing (SWALUW et al., 2018). The pleasure associated with achieving a goal and a motivating stimulus to keep on doing it are important factors associated with behavioral economy and hedonism.

Albelwi Rogers and Kubis (2019) identified that PA can be seen as a reward when allied with the pleasure of practice to motivate it. The authors investigated how a reward loses value over time, and, for this purpose, they placed PA, food, and Money as rewards. The participants of the study walked/ran on a treadmill. They were stimulated to perform this activity in a pleasant way, and for this, the participants themselves indicated and manipulated the speed, so that they felt pleasure when doing the exercise. After, the participants were submitted to tests to evaluate how a reward loses value over time when we need to wait to receive it. PA presented itself with values compared to those of discount food over time, and better than money, that is, over time it depreciates less than money, due to its known benefits in the long term, as well as due to the form of implementation, which should be pleasant, reminiscent of hedonism. The authors also found that PA discounting can be positively associated with the motivation to the practice (ALBELWI; ROGERS; KUBIS, 2019). This study was able to indirectly demonstrate that PA is perceived as a reward and its valuation exists, being influenced by reasons for having an immediate or later discount.

This can be considered a milestone in PAV, since Albelwi, Rogers, and Kubis (2019) determine a situation in which PA is seen as a reward, i.e., it was "valued". In their study, the motivation and pleasure associated with PA practice and its positive effects were considered a valuable strategy to be used by people regarding PA as a reward. Therefore, PA can be motivated through a reward, and when performed in a pleasant way can present a higher valuation by the individual. Thus, the idea of PAV is important to understand individual behaviors and choices and how they relate to the practice of PA.

Regarding the concept of reward, Swaluw et al. (2018) and Patel et al. (2018) address the "delay discounting" theory, which says that the reward loses its value over the time required to receive it (GREEN; MYERSON, 2004), i.e., it can lose its importance to the individual. One of the explanations for the non-devaluation of PA in relation to money over time in the study by Albelwi, Roger, and Kubis (2019) may be the characteristic of pleasure and motivation combined with the PA practice. An important point to be considered is that the studies including monetary rewards, as the ones mentioned before, were conducted in countries that can pay volunteers (for participation in the research/study). In Brazil, this is not allowed once is considered unethical. This can explain why no Brazilian studies addressing the PAV theme were not found.

In the present literature review, two experiences approaching the concept/idea of valuation in the context of PA motivated by rewards and not including the monetary cost were found. In Mexico (LUKAC, 2016) and in Moscow (METRO RIDES..., 2013), the individuals who did a predetermined number of squats would receive a subway ticket (BUTGEREIT; MARTINUS, 2017). In this case, the "energetic cost" of the number of squats corresponds to the cost of the subway ticket. However, to what extent such an exchange can be considered a valuable reward? If the number of squats increased on a daily basis, would this exchange (squat versus ticket) always be a viable choice? In other words, at some point would the "energy cost" of squats not be "worth" the subway ticket reward? The justification for such public policy in Mexico is that the PA levels of the individuals who would adhere to the proposal would increase, and this would result in improved general health (LUKAC, 2016).

In Moscow, in addition to the previous justification, the city would host the Olympic Games and the government wanted the population to notice that the purpose of the event was not only a competition just to watch but should serve to encourage people to adhere to a physically active lifestyle (METRO RIDES, 2013).

However, this type of reward for practicing PA with the idea of PAV in mind is questionable: does this type of intervention generate pleasure and make people value PA? Are individuals who adhere to this type of intervention those who are economically less advantaged? Publications with the results of such interventions were not identified in the scientific literature; however, in 2017 one article addressed this information as a way to motivate PA practice (BUTGEREIT; MARTINUS, 2017).

## **5 FINAL CONSIDERATIONS**

It is possible to state that PAV is as an important concept to be analyzed and contextualized since it allows us to identify how important PA is and how the individuals, even in a subliminal way, identify the need and the importance of practicing PA. This is a relation to be established, analyze whether the individuals who present PAV (and what kind of valuation) have a more active lifestyle, and observe what processes can influence decision-making for this PAV. It is known that decision-making for a physically active lifestyle depends on many factors, such as culture, leisure, environment, and social conditions, among others. The complexity of this discussion was not addressed given that there is a vast literature and that the corpus of analysis in the present study was aimed at understanding the concept of PAV. However, it is important to highlight that these factors cross the involvement and consequently the value attributed to PA.

The concept of PAV still needs to be further investigated and deepened. In this review, we identified studies that demonstrated that it is possible to arouse a stimulus and/or reward in individuals to perform PA, as long as it is surrounded by pleasure and individual needs and preferences. For a higher PAV, it is important that the practitioner be able to identify what triggers pleasure in PA practice, and recognize the benefits of the practice and the avoided losses so that physical activity can be considered the best choice, i.e., valuing PA.

Considering what has been discussed throughout this article, it can be seen that PAV is a broad concept, which involves the importance of a value judgment related to the individual's point of view, based on their preferences. It was identified that, within the methods used in environmental valuation, hedonic price/cost, contingent valuation, and avoided cost can be used to contextualize PAV. Another point to be highlighted is that, within the context of PAV, in addition to the "monetary cost" (it is known that "money" is still a barrier considered by some people), the "energetic cost" of practicing PA can be considered in the cost versus benefits ratio for PAV.

Finally, it is worth highlighting that in this review the discussion of the idea of PAV was carried out in parallel with related themes, as specific studies in this aspect were not found. Therefore, it is suggested that specific studies to identify PAV be developed.

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Resumo: A valoração da atividade física é uma abordagem não evidenciada como conceito ou definição. Assim, o objetivo do presente estudo foi compreender a conceituação e fomentar uma discussão preliminar acerca da valoração da atividade física, por meio de uma revisão sistemática de literatura seguida de uma revisão integrativa utilizando diferentes estratégias de busca. A partir dos critérios de inclusão da revisão sistemática não foram identificados estudos que procuraram definir e/ou conceituar a valoração da atividade física. Porém, a partir da seleção e leitura dos artigos na revisão integrativa, buscou-se compreender em quais contextos os estudos foram desenvolvidos e quais os métodos de valoração se referiam à atividade física. Sugere-se que a valoração da atividade diz respeito à importância que o indivíduo direciona a atividade física, ou seja, um juízo de valor determinado à atividade física que pode se relacionar ao custo hedônico, valoração contingente e ao custo evitado.

Palavras-chave: Formação de conceito. Tomada de decisões. Atitude. Julgamento.

Resumen: La valoración de la actividad física es un enfoque no evidenciado como concepto o definición. Así, el objetivo del presente estudio fue comprender la conceptualización y promover una discusión preliminar sobre la valoración de la actividad física, a través de una revisión sistemática de la literatura seguida de una revisión integradora, utilizando diferentes estrategias de búsqueda. Con base en los criterios de inclusión de la revisión sistemática, no se identificaron estudios que buscaran definir y/o conceptualizar la valoración de la actividad física. Sin embargo, a partir de la selección y lectura de artículos en la revisión integradora, buscamos comprender en qué contextos se desarrollaron los estudios y qué métodos de valoración se referían a la actividad física. Se sugiere que la valoración de la actividad atañe a la importancia que el individuo le da a la actividad física, o sea, un juicio de valor determinado a la actividad física que puede relacionarse con el costo hedónico, la valoración contingente y el costo evitado.

Palabras clave: Formación de conceptos. Toma de decisiones. Actitud. Juicio.



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#### **CONFLICT OF INTERESTS**

The authors declare that this work involves no conflict of interest.

#### **AUTHOR CONTRIBUTIONS**

Ana Flávia Andalécio Couto da Silva: Conception, study design, analysis and interpretation of data, original draft, critical and final review.

Camila Bosquiero Papini: Conception, study design, analysis and interpretation of data, original draft, critical and final review.

Emerson Sebastião: study design, original draft, critical and final review.

Karina Brunheroti: study design, data analysis, critical and final review.

Alynne Christian Ribeiro Andaki: study design, critical and final review.

**Eduardo Kokubun:** Conception, study design, critical and final review.

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# **EDITORIAL RESPONSIBILITY**

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