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RICCARDO BORGHERESI

THE EFFECT OF PHYSICAL ACTIVITY AND BODY IMAGE ON THE SUSTAINABLE DIETS ADOPTION: A COMPARISON BETWEEN THE ITALIAN AND BRAZILIAN POPULATIONS

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Advisor: Prof. Dr. Carlos Eduardo Lourenço

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Committee members:

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Prof. Dr. Carlos Eduardo Lourenço

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Prof. Dr. Ramona de Luca

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Prof. Dr. Lilian Pereira

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Abstract

As society amplifies the discussions and practices on sustainability, the concept of sustainable diets is reaching a broader audience. To accelerate dietary behavioural changes towards more sustainable dietary patterns, it is necessary to have a more comprehensive view of consumers' mental paths. Individuals' conditions, as the engagement in physical activity and the concern with the one's body image, might be determinants of healthier and more sustainable choices.

The purpose of the present research is to investigate the effects of physical activity and body image on the adoption of a sustainable diet, along with the effect of the perceived benefits of adopting a sustainable diet in moderating these relationships. Using an online consumer-based platform, a survey collected responses of 403 individuals, 202 Italians and 201 Brazilians. The results show that both populations present low levels of physical activity and a mild concern with body image. Respondents have a high perception of the benefits related to sustainable food practices, especially the ones related to their personal sphere. Being engaged in physical activities has proved to positively influence the adoption of sustainable dietary behaviours, while having a concern with body image does not translate into similar results. When investigating the moderating effect of the perceived benefits on physical activity and body image, no effects were confirmed for the adoption of sustainable diets. Italian respondents present lower engagement in physical activity and lower body image concerns than Brazilians, but higher adoption levels overall.

These findings expand the marketing and sustainability literature providing emerging consumers' patterns, and provide important indications for public health and health promotion. A coordinated action of public bodies, health and environmental organizations, and businesses is necessary to guide the transition of individuals towards a healthier lifestyle driven by a more sustainable consumption. The promotion of educational programs, especially directed to young people through the development of awareness-raising campaigns, must focus on sustainable diets as a win-win solution for the environment and the consumers.

Key words: Sustainable diets; dietary behaviours; physical activity; body image; benefits.

Resumo

Com a sociedade ampliando as discussões e práticas sobre sustentabilidade, o conceito de dietas sustentáveis está alcançando um público mais amplo. Para acelerar as mudanças de comportamento alimentar rumo a padrões dietéticos mais sustentáveis, é necessário ter uma visão mais abrangente dos caminhos mentais dos consumidores. As condições individuais, como o envolvimento na atividade física e a preocupação com a imagem corporal, podem ser determinantes para escolhas mais saudáveis e sustentáveis.

O objetivo da presente pesquisa é investigar os efeitos da atividade física e da imagem corporal na adoção de uma dieta sustentável, juntamente com o efeito dos benefícios percebidos da adoção de uma dieta sustentável na moderação dessas relações. Utilizando uma plataforma online, uma pesquisa coletou respostas de 403 indivíduos, 202 italianos e 201 brasileiros. Os resultados mostram que ambas as populações apresentam baixos níveis de atividade física e uma leve preocupação com a imagem corporal. Os respondentes têm uma alta percepção dos benefícios relacionados às práticas alimentares sustentáveis, especialmente os relacionados à sua esfera pessoal. Estar envolvido em atividades físicas provou influenciar positivamente a adoção de comportamentos dietéticos sustentáveis, enquanto ter uma preocupação com a imagem corporal não se traduz em resultados similares. Ao investigar o efeito moderador dos benefícios percebidos na atividade física e na imagem corporal, nenhum efeito foi confirmado para a adoção de dietas sustentáveis. Os respondentes italianos apresentam menor envolvimento na atividade física e menor preocupação com a imagem corporal do que os brasileiros, mas níveis mais altos de adoção em geral.

Estes resultados expandem a literatura de marketing e sustentabilidade, fornecendo padrões emergentes de consumidores, e fornecem indicações importantes para a saúde pública e promoção da saúde. Uma ação coordenada de órgãos públicos, organizações de saúde e ambientais e empresas é necessária para orientar a transição dos indivíduos para um estilo de vida mais saudável, impulsionado por um consumo mais sustentável. A promoção de programas educacionais, especialmente dirigidos aos jovens através do desenvolvimento de campanhas de conscientização, deve se concentrar em dietas sustentáveis como uma solução vantajosa para o meio ambiente e para os consumidores.

Palavras chave: Dietas sustentáveis; comportamentos alimentares; atividade física; imagem corporal; benefícios.

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1. Introduction

The actual scheme of production and consumption of food has a strong impact on the degradation of our environment and the depletion of the natural resources of our world. Beyond being responsible for the loss of biodiversity, for the deforestation, and for being a significant driver of land conversion, the food production system generates 20-35% of current greenhouse gas emissions, recognized as one of the main causes of global warming (FAO, 2019). In terms of food categories, livestock production accounts for most of these emissions. With the global population expected to expand to 10 billion individuals by 2050, the food production has to increase 70% to feed the future population while maintaining the limit of 1.5 °C of warming (IPCC, 2019). Given these premises, it is not realistic to think about the current food system as sustainable.

As society amplifies the discussions and practices on sustainability, the concept of sustainable diets is reaching a broader audience. Initially related only to the appropriate use of the environmental resources or diminishing the environmental impact along the food supply chain (Vermeir et al., 2020), the concept of sustainable diet has also expanded into human health and the perception of well-being, accessibility, safety, equity and cultural adequacy. Sustainable food consumption has gained traction among consumers (Morone et al., 2019) and it has become paramount to connect such green-buying customer behaviours to the implications that these preferences exert in the broad food supply chain.

Since individuals maintain psychological distance to the topic, investigating effective consumer selection towards more sustainable options remains a challenge (Loy & Spence, 2020). Adopting a sustainable diet brings a wide range of benefits, both to the environment and to the individuals' health and well-being. Consumers are used to evaluating more correctly the self-impact of their food choices compared to the environmental impact (Lea & Worsley, 2008), and to increase the adoption of sustainable dietary patterns they need to be properly assured that changes in their behaviours reflect in positive benefits for the environment as well (Siegrist et al., 2015).

To have a more comprehensive view of the consumers' mental paths regarding sustainable options, it becomes fundamental to understand under which conditions individuals are adopting a sustainable dietary pattern. In this sense, two aspects that are linked to each other, as health-

related behaviours, and that must be further studied as determinants of sustainable diets adoption, are the individuals' levels of physical activity and the body image concern. The understanding of these casual relationships expands the discussion around sustainable diets and opens a space for reflection for public and private bodies to implement policies that aim to increase the adoption of healthy dietary patterns.

Among the previous studies that assessed the relationship between physical activity and sustainable diets adoption, a major body of the literature focused on the individuals' concerns over the impact of meat-alternative foods on the growth and maintenance of muscle and the athletic performance (Philips et al., 2015; Kårlund et al., 2019), and on the concerns over the energy requirements for physically active individuals (van Vliet et al., 2015; Melina et al., 2016). Some recent researches hypothesized that individuals who have a physically active lifestyle should lead a healthier lifestyle of most of society (Meyer & Reguant-Closa, 2017) and found that physical exercise increases the consumption of fruits and vegetables (Jayawardene et al., 2015). With regard to the effect of body image concerns over the adoption of healthy dietary behaviour, there is not a generalized opinion in the literature yet. Most of the previous studies found that body image dissatisfaction is a strong predictor of weight management actions, particularly associating it with the intention of changing lifestyle (Bouzas et al., 2019; Kuk et al., 2009), while other researchers found that body image concern leads to eating disorders (Korn et al., 2013; Berg et al., 2009).

Given this literature background, despite an increased interest in the topic, to the author knowledge no prior studies specifically assessed the effect of physical activity nor of body image on the adoption of sustainable dietary behaviours. Whether the degree of physical activity and the body image concern have a direct effect on sustainable diets adoption remains an open question.

In light of this, this exploratory study aims at understanding the effect of physical activity levels and body image concerns on the adoption of sustainable dietary behaviour by Italians and Brazilians, highlighting the differences between a high-income and an upper middle-income country. Moreover, this research wants to test if the perceived benefits of adopting a sustainable diet effectively moderate the relationship between physical activity levels and body image concerns on the adoption of sustainable dietary behaviours.

More specifically, the study seeks to answer the following research question:

“What are the effects of physical activity and body image on sustainable diets adoption?”

The general objective is the explanation of the relationship between physical activity and body image (independent variables) and the adoption of sustainable diets (dependent variable).

Besides this, this research tries to pursue three more specific objectives:

1. Identify the relationship between the perceived benefits of adopting a sustainable diet and the adoption of the sustainable diet;
2. Verify if the perceived benefits effectively moderate the relationship between physical activity levels and body image concerns with the adoption of the sustainable diet;
3. Highlight key differences among the Italian and Brazilian populations in terms of physical activity, body image, perceived benefits and sustainable dietary behaviours to compare the perceptions and behaviours of individuals from a high-income and an upper-middle-high income country, and propose tailored solutions.

This research study is structured in six chapters, including this first introductory chapter.
The second chapter contains a review of the previous literature regarding the topics of sustainable diets, physical activity and nutrition, body image and nutrition, benefits of adopting a sustainable diet and the cultural distance between Italy and Brazil. The third chapter contains the methodology used for drawing up the study. Data were collected through a survey in Italy and Brazil. The results of the survey are described in the fourth chapter and discussed in the fifth chapter together with the implications of the research, its limitations and the future research directions. The sixth chapter is dedicated to the conclusions.

Theoretically, the study addresses the research areas of consumer behaviour and food sustainability. As such, the project addresses a gap in the intersection of physical activity and body image studies with the literature on the adoption of sustainable diets, investigating if being physically active or having concern with body image increases the adoption of sustainable dietary behaviours. Another value added is the comparison between the two countries, which helps to understand specific details related to the phenomenon under investigation.

This study investigates a new trend that influences and questions the practices of the global

food industry. Sustainable diets adoption is fueling the discussions about sustainability into food production and consumption to such an extent that it is drastically changing the behaviours of the society at large. However, the connection between the adoption of a sustainable diet and the concepts of physical activity and body image has not been properly evaluated yet.

2. Literature Review

In this chapter, an analysis of the existing literature regarding the object of study will be proposed. In particular, the topics that are going to be reviewed are the following: the context and the evolution of the concept of sustainable diets; the consumption of sustainable food and the adoption of sustainable diets at the consumer level; the relationship between physical activity and nutrition; the relationship between body image and nutrition; the benefits of adopting a sustainable diet; and finally, the importance of the socio-cultural context and the cultural distance between Italy and Brazil measured with the Hofstede's model.

2.1 Sustainable diets

2.1.1 Sustainable diets: the context

Over the last years, the environmental pressures on the food systems have been constantly increasing, consequently making sustainability the main focus of future food policies. The degradation of the environment together with the malnutrition in all its forms are taking place at a quickened pace, and these are considered two of the major challenges of our times.

The actual scheme of production and consumption of food has a strong impact on the degradation of our environment and the depletion of the natural resources of our world. Considering it globally, food production is pursued through the usage of about 50% of habitable land converted into farming land and 70% of freshwater availability (FAO, 2019). Only considering the agricultural activity, it accounts for nearly 70 per cent of the global withdrawals of water (FAO, 2017). In the period between 1962 and 2010, around 500 million hectares of forests and woody savannas have been converted into agricultural land (Alexandratos & Bruinsma, 2012) and the scenario for 2050 is that agriculture land must further expand by 855 million hectares (Searchinger et al., 2018). The cost of clearing more land for agriculture is great for the environment and it would provoke a biodiversity crisis: the challenge remains the expansion of food production without increasing the land conversion rates. Besides, beyond being responsible for the loss of biodiversity, for the deforestation, and for being a significant driver of land conversion, the food production system generates between 20-35% of current greenhouse gas (GHG) emissions, recognized as one of the main causes of global warming.

Demographic, social, and economic factors are with no doubts influencing the lifestyles and necessarily modifying the eating patterns of individuals. It is not realistic to think about the current food system as sustainable when the world's population is forecasted to reach almost 10 billion individuals by 2050: the worldwide food production will need to expand by 70% to feed the future population (FAO, 2019) with a shift from the 'energy-dense' current diet to a more balanced 'nutrient-dense' diet[1]. As it has been underlined by the Intergovernmental Panel on Climate Change (IPCC) in their last report "consumption of healthy and sustainable diets presents major opportunities for reducing GHG emissions from food systems and improving health outcomes" (IPCC, 2019). Yet, the transition to more plant-based dietary patterns, following WHO dietary recommendations, would reduce mortality worldwide by 6-10% compared with a reference scenario in 2050. Moreover, this would provide considerable economic benefits estimated at around 1-31 trillion US dollars, which means 0.4-13% of the global GDP in 2050 (Springmann et al., 2016). This range expresses the value of health benefits related to dietary change and it considers both direct and indirect health-care costs. The breadth of this range is due to the calculation methodology of the authors who used both the "cost-of-illness" method, which evaluates the economic impact on the health-care sector, and the "value of statistical life" method, which reflects the willingness of individuals to pay for mortality reductions. The former led to much higher benefits related to dietary changes towards plant-based patterns than the latter.

The other major issue that requires to be addressed is malnutrition, considered in its various forms. According to FAO, in 2020 about 821 million people worldwide do not have enough food to live a healthy and active life, which means one every nine people in the world. Most of these individuals live in developing countries, mostly in Asia and the Pacific regions, a significant part in sub-Saharan Africa, and millions of people belong to Latin America and Caribbean countries. The topic is complex, and it is not going to be discussed in this study, but among the causes of hunger in the world two must be mentioned. First, the inaccessibility of food that occurs when there is a lack of infrastructures, war and internal conflicts, natural disasters, and geographical isolation. Second, and maybe more relevant, is the waste of food that still concerns up to one-third of the food produced around the world and never consumed.

1 Energy-dense food is the opposite to nutrient-dense food, and they differ for the ratio of energy (or calories) content per gram of food. The former refers to foods high in calories and high in fat (sweets, butter, cheese, fried foods). The latter refers to foods low in calories and high in water (fruits and vegetables, seafood, eggs and wholegrains).

If on the one side people are missing food, on the other side data show an even worse situation. The World Health Organization estimates that the obesity rate worldwide has almost tripled in the last 45 years: 40% of the adults older than 18 years were overweight in 2016, and one-third of them were obese. In 2019, 38 million children less than five years old were obese or overweight (WHO, 2019). Being overweight or obese increases the risk of diet-related non-communicable diseases (NCDs), which are provoking 4 million deaths globally because of an excessive intake of salt or sodium (GBD, 2015).

Fundamentally, these diseases are caused by two trends that are going to be deeply studied in the current thesis: the increased intake of energy-dense food high in fat and sugars, and the increased physical inactivity caused by progressive urbanization and by the shift to a more sedentary nature of many jobs.

2.1.2 Sustainable diets: the concept

Given this context, and considering the tremendous effects both on the environment and on the malnutrition of individuals, there is the urgency of promoting a sustainable and healthy diet which can limit these phenomena. Even if different versions of the term “sustainable and healthy diets” have been presented over the last years, the first detailed description was given during a study conducted on the effects on the environment of the adoption of the American dietary guidelines in the mid-eighties as "food choices that support life and health within natural system limits into the foreseeable future." (Gussow & Clancy, 1986).

However, the official definition commonly used nowadays is the one provided by the Food and Agriculture Organization (FAO) of the United Nations (UN) and by Biodiversity International that defined sustainable diets as

> those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources. (Burlingame and Dernini, 2012, p. 7)

Such definition clarifies the multi-stakeholder approach to the subject, along with the interdependency of nutrition and health, the food industry, and the environment, to effectively transform daily food ingestion into sustainable diets. It remains hard to classify sustainable diets

into a precise category because of the breadth of its concept. Anyway, in the definition five main dimensions of importance can be recognized, also definable as the pillars of sustainable healthy diets: ecological, economic, ethical, healthy, and socio-cultural.

The ecological dimension addresses mainly the increasing GHG emissions and global warming caused by livestock production. During the fifty years before the FAO report was published, the GHG emissions from poultry, pork and beef cattle production increased by 59 %, 89 % and 461 % respectively, with the predominance of the beef cattle that accounted for 54% of the total livestock emissions (Caro et al., 2017). In 2017 the GHG emissions induced the global warming to reach approximately 1 °C above pre-industrial levels, and the following year a call to action was announced to respect the limit of 1.5 °C of warming (IPCC, 2019).

The economical dimension remains a key topic from both the supply and demand sides: the current food industry is marked by imbalances, and the power is not equally concentrated, causing great profits to some actors and a constant impoverishment to others. Nowadays, around 750 million people live in extreme poverty conditions and suffer from hunger and malnutrition (World Bank, 2020).

When we refer to ethical food production there is a variety of actors that must be taken into consideration (Browne et al., 2010). First, ethical considerations around people, especially the welfare and the working conditions of the individuals involved in the food industry, whether they are co-operatives producers or producers from small farms, plantations, or large estates. Practices which need to be revised carefully are pay equality, child labour, and working conditions. Second, ethical concerns about the environment are centred on sustainable and non-degradative practices, as careful use of the land and pollution reduction practices. Finally, the animal-centred ethic refers to animal rights and their welfare, for example avoiding experimental tests and exploitative practice as intensive animal farming.

Since unhealthy food overconsumption is steadily increasing, the need to shift towards different dietary patterns is nowadays more urgent than ever. Healthy reference diets consist of appropriate intake of calories with a great amount of plant-based food, a large variety of vegetables, fruits, legumes, unsaturated oils, nuts and legumes, and with a low amount of food from an animal source, with the exclusion or strong limitation of red meat or processed meat amount, but with the inclusion of low-moderate quantities of seafood and poultry. Moreover,

no or low amount of refined grains, starchy vegetables and added sugar must be included (Willett et al., 2019).

The food we produce and consume is tightly linked with the religious, geographical, historical, socio-cultural context, and this produces a great variety of diets worldwide. The difficulty to create a sustainable and healthy diet reference framework is that each context must face diverse challenges like food accessibility and availability, thus it needs a tailored solution to be implemented. Despite the possible answers being different, the objectives of sustainable diets are the same for all the individuals and what remains is to deliver specific actions responding to the contextual needs.

To conclude, sustainable healthy diets regimens are dietary examples that promote all elements of people's well-being and prosperity; have a low environmental impact; are budget-friendly, easily accessible, salubrious and non-discriminatory; also, they are socially adequate. The goals of sustainable diets' promotion are to accomplish ideal social development and individuals' growth both physically and mentally, resulting in social prosperity at all life stages for future and present generations; to help to forestall all types of hunger (for example undernutrition, micronutrient insufficiency, obesity and overweight); to diminish the danger of diet-related non-communicable diseases (NCDs); to uphold the protection of biodiversity and planetary well-being. Sustainable healthy diet regimens must join all these components of sustainability to avoid unforeseen repercussions (FAO, 2010).

2.2 Sustainable diets at the consumer level

With the advancement of discussions on sustainability, the concept of sustainable diets, which was initially more related only to the low environmental impact of a diet (FAO, 2010), has also expanded to the dimensions of human health and well-being, accessibility, safety, equity and cultural adequacy, demonstrating how rich and vast the interconnection between sustainability and food is (FAO & WHO, 2019).

The breadth of the definition leaves room for a wide interpretation in the literature with a growing body of studies that attempt to reproduce the concept in a more operational perspective (Scott, 2018). The comprehensive references of the term 'sustainable diets' suggest the possibility to look at sustainability practices across the food system by concentrating the

attention on the action of consumption (IPES-Food, 2017). In this sense, consumption turns into a focal point to discuss what foods' combination should be eaten considering the differential energy provisions and personal requirements.

2.2.1 Sustainable food consumption

Sustainable food consumption has increasingly been gaining attention among consumers and importance among multi-stakeholders (Grunert et al., 2014). Now, more than ever, it is fundamental to connect customers' decisions to the implications their preferences have on the broad food supply chain, as such choices are resulting into the avoidance of over-processed products and different purchasing patterns are consequently emerging with regard to more sustainable options, food safety and quality standard (Pearson et al., 2011). Nevertheless, studying operative consumer selection towards more sustainable choices remains a challenge (van Giesen & Leenheer, 2019) as consumers' understanding of the importance of sustainability does not translate into low carbon footprints since they maintain an evident psychological distance to the topic (Spence et al., 2012).

The understanding of consumers' attitudes is critical because it can provide fundamental insights to elaborate on important environmental decisions which may affect many social actors as distributors, producers, NGOs and others. Studying consumers' decision process could provide comprehension of the most salient attributes evaluated in a dietary shift, and the dietary change motivations of moving to sustainable diets.

In the society level, sustainable diets include the increased consumption of organic fruits and vegetable, as well as the consumption of local products, which permits to avoid long-distance displacement of food and the related transportation costs for the environment, and the consumption of seasonal products, which have a better taste, more nutrients and produce less GHG emissions. In order to minimize the use of natural resources, modifications in the current services and goods consumption and production are needed in a global perspective. Thus, the retail environment is changing because of consumer preferences and, above these, one of the most relevant is the ecological food consumption (Tobler et al., 2011). Conscious consumers are following the trend of "eating to save the planet" which refers to the translation to dietary patterns that reduce carbon footprints increasing the natural or renewable resources usage. Self-benefits can be reached since there is evidence that the shift to more environmentally friendly diets, even in a moderate amount, could provide a general healthier food intake (Tukker et al.,

2011). Apart from the large number of self-benefits, the consumers' persuasion to move to a more sustainable consumption reflects in a positive effect on the entire food supply chain, avoiding many environmental issues related to the production, distribution and food consumption (Tobler et al., 2011). It is now possible to affirm that there has recently been a shift towards plant-based alternatives as the awareness of the consequences on the environment of food choices grew, and consumers' demand for animal-based foods alternatives or no meat products increased because of the diffused perception that plant foods have a minor impact on the environment (Burd et al., 2019). The Nielsen Company in a study in partnership with the Plant Based Food Association found that there has been a rising trend in the sales of plant-based food in 2018 in the Northern American population with a yearly growth of around 20%, compared to an overall food growth of 2%, which may be due to the high-quality supply alternatives pushing this category (Blumenfield, 2018).

2.2.2 Sustainable diets adoption

The rapid growth of the human population enlarges the global food demand, and this brings immense concern to the environmental pressure of food production. Also, science is affirming with more and more consistency that the adoption of alternative dietary habits could diminish greenhouse gas emissions, deforestation and biodiversity loss caused by food production. According to the Food and Agriculture Organization of the United Nations (FAO), global adoption of a low-meat diet that meets nutritional recommendations for fruits, vegetables, and caloric requirements is estimated to reduce diet-related GHGs by nearly 50 per cent (FAO, 2019). Therefore, it is the consumers' responsibility to change their dietary habits and adopt more sustainable options, given the direct effect that their food choices have on the entire food supply chain (Tirado-von der Pahlen, 2017).

However, what stands out from the literature is that, despite a recent rising trend in the consumption of plant-based food, consumers have always been showing strong resistance to changing diets and if the willingness to change different dietary habits occurs, it happens in stages in a continuous line from no-adoption to full-adoption (Tobler et al., 2011). There is a great body reference from previous studies of the motives that determine food choices, and it is clear that the intake of more ecological food is a hard choice to consumers because of many factors that must be considered simultaneously (Tobler et al., 2011). As an example, the packaging disposal has a more noteworthy effect than meat consumption as it is seen as a more

aggressive to the environment (Macdiarmid et al., 2016). Nonetheless, what is scientifically recognized as the main barriers to the adoption of a more sustainable diet are the enjoyability of meat consumption and the lack of information about sustainable diets (Lea et al, 2006). Indeed, for some specific groups of food individuals are even more resistant to change, especially for dairy and meat products (Macdiarmid et al., 2016).

Even if vegan and vegetarian dietary options have the lowest environmental impact in terms of GHG emissions (Chai et al., 2019), it is not necessary to adopt such a stage to provoke some improvements to the planet. Indeed, dietary patterns which include less meat and animal-source foods, also known as 'flexitarian diets', have noticeably minor impacts since their production requires fewer natural resources like freshwater and arable land. In this sense, it is important to underline again that a sustainable diet is not a diet which necessarily excludes meat and meat derivatives products from its menu. This is because the shift to dietary patterns that do not comprehend meat would be not that easy and achievable for a population that is accustomed to meat consumption, thus denying the principle of accessibility of sustainable diets (FAO, 2010). Indeed, meat consumption is profoundly implanted into the Western culture as its relation to cultural norms has been reinforced thanks to a more efficient supply chain, which progressively has caused a decline in the prices and consequently has increased product availability (Sabate & Sabate, 2019).

There remain still plenty of opportunities to connect individuals' attitudes to the effective behaviour in respect of environmental issues related to food consumption (Loy & Spence, 2020). In this situation, the understanding of individuals' decision patterns is fundamental to defeat attitudes and habits which are conflicting with a more sustainable dietary habit (such as the packaging versus entire supply chain meat example).

2.3 Physical activity and nutrition

In this section of the literature review, the previous studies regarding the relationship between nutrition and physical activity will be discussed. This research area has been deeply explored by academicians, nutritionist and scientists who have been analysing the topic under different points of view. The goal of the following paragraphs is to provide the readers with a general overview, not going too profoundly in details, of all these different perspectives. The section will be structured as follow: the first subparagraph reports the general context in which the previous studies have emerged; the second discusses the adoption of plant-based and sustainable dietary patterns by physically active individuals.

2.3.1 Contextualization of nutrition and physical activity

One of the most diffused public health problems that have been identified in the last century is physical inactivity, which is considered one of the ten main sources of disability and mortality as it causes about 2 million deaths annually worldwide (Blair, 2009; WHO, 2004).

Previous literature has already extensively highlighted the influence on sports performance of nutrition and nutritional aspects. The recommendations to physically active individuals should seek to ensure the best performance while considering the necessity of health promotion and maintenance (Jeukendrup, 2011). Dietitians are trying to reduce the gap between the way athletes should eat, following the recommendations, and the way they actually eat. To achieve this and make athletes independent in their dietary decisions, the effort of nutritionists is focused on the comprehension of the significance of nutrition and food in general (Juzwiak, 2016). A heterogeneous and diverse audience is targeted by the sports nutrition actions, ranging from professional athletes who compete at a high-level, to aspiring athletes, up to individuals with a physically active way of life who decide to begin a structured exercise and dietary program.

Sports science has been continuously evolving over the last century on the one side because of the new scientific discoveries and on the other side because of the evolution of consumption and the food supply. Nonetheless, there has been little evidence from a scientific perspective of the relationship between diet and improved performance until the first half of the twentieth century, when the first studies on the carbohydrates for exercise resistance were conducted, and it was only in the 1960s that a more comprehensive knowledge about the glycogen stores role was discovered, consequently signing the start of new dietary strategies as the 'carbo-loading'

(Applegate & Grivetti, 1997). Talking about diets and food intake for physically active individuals mainly means talking about proteins, as this essential macronutrient component of the human diet is the primary source to build or repair the muscular tissue when it is damaged during exercise. Of course, proteins are not the only source of energy for exercise, but they also can act as a substitute when a diet lacks enough carbohydrates intakes. It is a common belief in the athletes' world that large doses of food intake and nutrients, together with supplements, produce greater results and major benefits, following the "more is better" philosophy (Martínez-Sanz et al., 2012). However, this practice has also already been identified with some issues as the use of supplements by athletes is not always clearly justified due to insufficient knowledge of the topic (Petróczi et al., 2007).

In order to integrate sustainability concepts in sports nutrition, dietitians' role is to create opportunities for learning through the so-called "food literacy", defined as that set of knowledge and skills related to nutrition to understand the life cycle of the products we eat (Meyer et al., 2020).

2.3.2 Sustainable nutrition and physical activity

A healthy eating pattern should consist of the ingestion of a high-quality variety of protein food to ensure an adequate supply of amino acids for the growth or maintenance of muscle (Phillips et al., 2015). In order to reduce disease risks and maintain physical performance, it is relevant to develop a healthy eating pattern which identifies the best foods combination to be included in a diet. Principal considerations are made around the protein quality, which depends on the amino acid content of the protein and its digestibility, and around the protein quantity that directly reflect into the maintenance and growth of the skeletal muscle tissue optimizing the muscular mass (Burd et al., 2019). Some sources of proteins seem to have a greater effect on body maintenance and reparation. Despite the different sources of proteins available, the personal characteristics of individuals as the digestion capacity clarifies that there is a need for personalized dietary recommendations (Kårlund et al., 2019).

Even if current research is not able to explain the clear impact in the long-term of vegetarianism on the athlete's performance, a vegetarian meal plan could be adequate in terms of nutrition since it contains high doses of vegetables and fruits, nuts, whole grains, fibre, soy products (Craig & Mangels, 2009).

To the author knowledge, no previous studies have stated that individuals with a physically active lifestyle have a higher propensity to adopt sustainable dietary patterns. However, individuals who practice physical activity are characterized by leading a more sustainable lifestyle than most of society, which is supposed to translate in a healthier food intake (Meyer & Reguant-Closa, 2017). As an example, a recent study on the Italian population showed that who practices sport continuously appears to adhere more to the Mediterranean Diet, categorized as a sustainable dietary pattern, than who practices sport occasionally (Benedetti et al., 2016).

The current knowledge on the topic has been summarized by a recent study which focuses on health and performance opportunities for physically active individuals, reviewing the protein requirements discussion as well as a large range of areas included in the sustainable dietary practices (Meyer et al., 2020). What remains as the main concern to adopt a flexitarian or plant-based approach, especially for physically active individuals, is related to the energy requirements, since it exists the general belief that is not possible to reach the same level of protein quality and quantity with exclusively plant-based foods (van Vliet et al., 2015). The position of the Academy of Nutrition and Dietetics is clear, and it states that vegetarian or vegan diets that are appropriately planned provide an adequate nutrition and health benefits at all life stages, including for athletes (Melina et al., 2016). As plant foods contain a lower and more limited amount of essential amino acids, there is the so-called “combining myth” for which a certain combination of different protein source foods is necessary to have a comparable protein intake to animal-source food. This strict combination has been found out not to be indispensable anymore if a large variety of plant foods is consumed every day: this would provide the body with an equal amount of amino acids that complement the protein’ requirements (Craig & Mangels, 2009; Melina et al., 2016). As an example, it has been shown how the regular intake of soy products and legumes can provide an appropriate protein amount to vegetarian and vegan apart from bringing into the organism other nutrients. Since athletes and nonathletes still maintain a psychological distance to the adoption, trainers and professionals play a critical role in their decisions, mainly educating on the foods’ sources of energy, awaking them that animal products are not necessary in order to obtain proper nutrition.

Despite the popularity of vegetarian and plant-based approaches gaining renewed importance lately, there are still several concerns regarding the impacts on the performance and the training adaptation (Lynch et al., 2018). Most of the body literature that deals with the topic of interest was summarized by a comprehensive study whose conclusion is that if on the one side the

consumption of a mostly vegetarian diet did not improve the athletic performance, at the same time it did not hinder it (Craddock et al., 2016). There is no evidence of differences in the areas of aerobic and anaerobic performance, muscular strength, and power between an omnivorous diet and a vegetarian diet. Following studies have been conducted, and two of them are worth to be mentioned. The first one is a cross-sectional study that addressed the endurance and aerobic capacity of omnivore and vegetarian athletes: no differences were found among the two dietary groups (Lynch et al., 2016). Scientifically speaking, plant-based dietary options, by the reduction of the dietary energy density, reduce body fat, which has the double effect of boosting body endurance and increasing the maximal aerobic capacity while bringing a leaner body composition (Barnard et al., 2019). More recently, new studies tried to link the dietary regime of a group of recreational runners, divided in omnivorous, lactovegetarian, and vegan, to the maximum exercise capacity: the results are the same as before, confirming that a plant-based approach does not have a significant impact on the athletic performance (Nebl et al., 2019).

A review of the previous literature regarding the effect of vegetarian and plant-based diets on the general population has confirmed the previously mentioned evidence: it is consistently indicated that the habitual consumption of a vegetarian, vegan, or plant-based diet does not negatively nor positively impact the athletic performance of individuals (Zhou et al., 2019).

To conclude, a limited number of sports nutrition guidelines and recommendations currently include the environmental impacts of different food-based strategies and even less integrate sustainability considerations in a quantifiable way. Hence, there is a need for alignment of educational tools and sustainability principles to promote a healthy way of eating, performing athletically and preserving the environment. Even if the literature strongly highlights that a plant-based regime offers both environmental and health benefits to non-athletes and athletes, there remains still modest evidence that such diets are per se better than omnivorous regimes to improve athletic performance and training (Larson-Meyer Enette, 2018).

2.4 Body image, nutrition and physical activity

In this section of the literature review the concepts of body image, weight status and body mass index (BMI), body dissatisfaction and misperception, and the consequent different weight loss behaviours are going to be summarized. The variable of body image has been widely studied, especially among adolescents, and it seems to be linked with physical activity choices and self-esteem, thus influencing lifestyle behaviours as the intention to change diet (Gaddad et al., 2018). Moreover, unhealthy weight-control behaviours have been shown to lower the personal body image, and body image dissatisfaction has also been linked with disordered eating behaviours (Loth et al. 2015). For this reason, a comprehensive view of the links among these variables appears to be necessary to resume the complexity of these relationships. This section will be structured as follows: in the first subparagraph, the concept of body image will be discussed according to the conditions of overweight and obesity, and the body mass index (BMI) classification will be explained. In the second subparagraph, the focus will move to weight loss behaviours as the responses to body image dissatisfaction.

2.4.1 Contextualization of body image

As the modern western society stigmatizes overweight and obese people, deprecates weight excess, and puts the stress on the body thinness, there is clear evidence of a link between obesity and a poor body image. The conditions of obesity and overweight are significantly influencing the individuals' well-being, as they provoke concrete daily disadvantages in areas as education, employment, and the possibility to adopt children; this bias consequently arises stigma and prejudices (Puhl & Brownell, 2001). Such conditions represent a significant health concern since they may bring to several psychological and physical consequences as depression, strokes, and cardiovascular diseases, as well as an economic burden for the society (Hong & Hong, 2019).

Before proceeding, it is important to explain how to use the terms "obesity" and "overweight". Both refer to an excessive condition of fat accumulation which represents a health risk, but there is a clear distinction. The most common unit of measurement to categorize individuals as underweight, normal weight and overweight is the body mass index (BMI) which is defined by the World Health Organization by the formula: weight (kg) / height (m^2). The ranges that are commonly used are listed in Table 1.

Table 1: Body Mass Index (BMI) classification for the nutritional status (WHO)

***BMI* (kg/*m*²)**	***Nutritional Status***
< 18.5	Underweight
18.5 – 24.9	Normal weight
25 – 29.9	Overweight (pre-obesity)
30 – 34.9	Obesity class I
35 – 39.9	Obesity class II
> 40	Obesity class III

Overweight and obesity are increasingly diffusing in middle and low-income countries, especially in urban settings, but they remain a problem especially related to high-income countries. As a representative example, in the United States of America the prevalence of obesity among adults was 42.4% in 2017-2018 with no significant age nor gender differences (NCHS, 2020).

The state of being obese or overweight does not always push individuals to begin any type of weight management action since the self-perception of the body image is sometimes not precise as people tend to underestimate their weight (Robinson, 2017). In this context, body image is defined as the self-perception of body shape, body mass index, or in general weight, and it is undergone in a continuous line from positive to negative (Roosen & Mills, 2014). Body image affects the weight management process: the perception of one's body shape far from its actual may instigate weight management actions (Almenara et al., 2019). Weight management actions can take place both in a situation of misperception and in a state of dissatisfaction. In this sense, the body image dissatisfaction (BID) is defined as the distance between the desired body and the self-perceived body (Mitchison et al., 2017), and the higher is the body dissatisfactions the higher the risk of having depression or engaging disordered eating behaviours like binge eating and calories counting (Wynne et al., 2016).

Furthermore, body image dissatisfaction is an extremely risky factor when related to obesity or disordered eating because it has a negative influence on approaching healthy lifestyle behaviours. According to a systematic literature review, body dissatisfaction is higher in obese people than in normal-weight individuals (Weinberger et al., 2016). Both incorrect recognition

of weight status, as well as negative body image, are threats for weight control, as this can be associated with unhealthy behaviours and psychosocial morbidities (Moehlecke et al., 2018).

The understanding of these consequences underlines the importance of assisting and promoting in all the population a positive body image to guarantee well-being and health.

2.4.2 Body image and weight management behaviours

Evolutionary trends of our society have caused the rise of the average standards of body mass index and a greater social pressure regarding physical appearance. On the one hand, the process of urbanization is recognized as one of the main drivers in changing dietary habits in the population as the urban lifestyle leads to adiposity. However, this process is currently taking place also in the rural areas since there is increasing mechanization of agricultural processes, and multinational companies are replacing most of the products with processed and more easily and rapidly available food (Bixby et al., 2019). On the other hand, body image is nowadays strongly influenced by a great amount of cultural and social factors like family, friends, and media. Media gained particular relevance especially in the last years due to the exponential growth of social platforms. Since the market of social media is not strongly regulated in its contents, big organizations (as food and beverage) are renown for exploiting these tools to sell the products they are offering, while health campaigns do not really show great interest and engagement (Maher et al., 2014). A recent systematic literature review shows that the social media engagement towards body image-related contents, which often portray improbable body standards, increases the body dissatisfaction and the willingness to diet or restrict food choices (Rounsefell et al., 2019).

In the western society, body dissatisfaction or the overall perception of being overweight is associated with weight loss actions, as individuals with a negative self-image are looking for a strategy to improve their aesthetic appearance (Bouzas et al. 2019). Several previous studies focused on adolescents, especially girls, and analysed the relationship between physical activity and body image, but the literature has not achieved a common opinion on the topic yet. One interesting conclusion is that irregular physical activity could indicate a higher frequency of attempts to improve body image; the irregularity could be explained by the not expected results of physical activity on the body shapes over time (Jankauskiene & Kardelis, 2005). However, the most commonly accepted vision is that individuals with a negative body image are less likely to engage in physical activity than those with a positive body image (Korn et al., 2013;

Kuk et al., 2009; Kirkcaldy et al., 2002). What stands out from the literature is that there is a strong correlation between physical activity, body image, self-esteem, and well-being (Gaddad et al., 2018).

A recent comprehensive systematic review summarizes the main findings regarding body image and weight management behaviours for the adult population (Bouzas et al. 2019). The overweight status is associated with the willingness to lose weight, but this happens less likely for those individuals who misperceive their weight. In this regard, taking genders into account, women are more likely to misestimate their weight than men and they are generally more worried about their body image due to a greater interest in appearance (Korn et al., 2013). The main strategies that people opt for are generally dieting and less frequently an increase in the level of physical activity, but this highly depends on the gender. Thus, men prefer to eat less high-fat foods, listen to advice from professionals and do exercise, while women tend to start special diets as eating more plant-based food, follow specialized weight loss programs or take pills (Tsai et al., 2016). To conclude, what stands out from the previous body literature is that body image satisfaction is associated with a minor willingness to adopt a different lifestyle or to change weight.

2.5 Benefits of adopting a sustainable diet

In this paragraph, the importance of consumers' consciousness for environmental decisions will be examined. The benefits derived from the adoption of a sustainable healthy diet will be discussed, and a review of the benefits categorizations from the literature will be proposed as well.

The understanding of consumer mental patterns in food choice is crucial nowadays to achieve sustainability goals, and that is why a growing number of studies has been produced in the last decade in this field. For this reason, a better understanding of consumers' food motives could be of necessary importance to encourage consumers to make more sustainable food decisions, which is becoming increasingly more difficult due to the vastness of factors that must be taken into account (Elhoushy, 2020).

To understand food choices, researchers usually use food choice motives since they are considered relevant to detect mental patterns for consumers (Sautron et al., 2015). The main reference is represented by the food choice questionnaire (FCQ) which measures the motives under a variety of dimensions as price, convenience, appeal, sensory weight control, health, familiarity, mood, natural content, and ethical concern (Steptoe et al., 1995). This model contains both motives more related to the product, which result in benefits for self, like health or price, and motives related to the production process which result in more external benefits as social justice or animal and environmental welfare. Most of the previous studies on food consumption and sustainable consumption traditionally focused on the motives and the related benefits from the product side, while the process motives were usually showing less reliability. However, a new wave of studies has lately been focusing on process motives, confirming their importance in adding value for explaining food choices (Verain et al., 2016).

Consumers are used to evaluating more correctly the self-impact of their food choices compared to the environmental impact (Lea & Worsley, 2008). Furthermore, they seem to misestimate the environmental effects of the various food attributes; for example, the packaging process is usually overrated in terms of environmental impact while the meat production is not always clearly linked to climate change as reduction of meat consumption is considered the least environmentally beneficial behaviour (Tobler et al., 2011). To increase the level of adoption of sustainable and healthy dietary patterns, consumers need to be properly assured that changes in their behaviours reflect in positive benefits for the environment as well (Siegrist et al., 2015).

Previous body literature tried to summarize the existing knowledge of benefits derived from such dietary patterns. One of the most comprehensive review (Corrin & Papadopoulos, 2016) divides the benefits in:

- Health benefits: those associated with a decrease of saturated fat intake, an increase of fruits and vegetable intake, or with the prevention of diseases;
- Well-being and peace/contentment benefits: those related with both the senses of gladness and the idea of creating a better world;
- Ethical and environmental benefits: those that deal with world hunger, animal welfare and food production efficiency.

Other studies have highlighted the trade-offs that consumers have to consider when making environment-related food choices, as some choices can produce conflicts between benefits which belong to different fields (for example, healthiness versus taste). On the other hand, some dietary patterns both present environmental and non-environmental benefits; for example, regional and seasonal fruits and vegetables may be perceived as fresher and with a better taste and they are environmentally friendly since they require shorter transportation and do not require the use of unheated greenhouses (Siegrist et al., 2015).

A classification that is often used in the literature for categorizing food choice benefits is related to the personal sphere. On the one hand, we find the 'altruistic' benefits when there is a relationship with other individuals, with the society or the environment, while on the other hand there are the 'self-centred' benefits that are more related to the individual himself. There is evidence that of the common values which drive individuals' behaviour, the values of 'benevolence' and 'universalism' are strictly related to purchases of sustainable food (Verain et al., 2012).

2.6 Socio-cultural context in food choice

In this final paragraph of the literature review, the importance of the socio-cultural context as a driver of food selection will be discussed. The first subparagraph reviews the evolution of the national dietary recommendations, with a specific focus on the Italian and Brazilian cases, highlighting their evolutions over the last decades. The second subparagraph introduces the cultural dimension theory, a framework that helps to understand the cultural distance in the two countries previously mentioned.

Studying the socio-cultural context of food choice and eating means studying food selection since the way food is eaten worldwide is affected by social constructions. The social guidance in food selection has been widely studied in the past, and it can be explicitly present, with a direct influence of people, or not, with other factors to be considered (Rozin, 1996). The factors that influence food choices could be summarized in genetic aspects, personal experiences, and the more comprehensive socio-cultural and physical environment (Contento, 2011). Furthermore, when we think about the customer journey as a mix of relations of people with the food purchasing actions, the interactions are with socio-cultural factors, cost and affordability of food, and food environment (FAO, 2019).

As a socio-cultural aspect, cognitive elements, defined as a set of symbols and values that express social and personal identity, shape dietary patterns interacting with both the negotiation and the choice moments. Gender represents an expression of plenty of cognitive elements when referred to food practices since there are gender-specific tasks in food procurement and preparation (Gittelsohn, 1991). Two more definers of food practices are religion and cultural prohibitions, which may apply differently to people according to their gender, age, or social reputation. Since individuals eat what they can afford, the cost of food and its relative affordability dominate food consumption. Independently by their income classification, countries present higher prices for nutritious food than for energy-dense food, which explains why low-income countries are usually not positively related to healthy food consumption (FAO, 2019). Food environments, defined as the physical places where the food is purchased or eaten, have experienced a great change over the last decades towards a larger supply of energy-dense food and a larger offer of out-of-home options for eating. Because of such structure, the access to nutritious food consequently became more difficult for the low-income population to whom it is now offered mainly energy-dense food with low nutritional values, enhancing social and

economic inequalities (Hilmers et al., 2012). In this context, public authorities play a fundamental role to improve food healthiness and availability.

2.6.1 Evolution of dietary guidelines

Given the previously mentioned context, nutritional advice is increasingly important nowadays to drive consumers' decisions towards food. Part of these recommendations are provided by professionals, as nutritionists, with mainly daily reference values, but these recommendations mainly address those individuals who are usually enrolled in weight loss programs. More general advice to the whole public has been provided in the last years by the food-based dietary guidelines.

The development of national dietary guidelines started in 1992 when in a conference held by the Food and Agriculture Organization of the United Nations (FAO) the final report 'Plan for Action' was diffused to claim the importance of nutrition information spreading. Since then, FAO has encouraged and directly supported countries to publish their tailored national dietary guidelines which must be adapted to the specific natural, economic, geographical and nutrition conditions of their national contexts. The food-based dietary guidelines are presented as educational tools with the final aim of promoting health and preventing diseases, and this is achieved through the diffusion of foods' nutritional composition and disclosing physical nutritional needs (FAO, 2016). Since 1992, FAO has supported more than 80 countries to develop their official dietary guidelines and it is interesting to notice that there is a clear correlation between the country's income, classified by the World Bank, and the likelihood of having a national guideline (Table 2).

Table 2: Countries with or without national dietary guidelines according to their classification by income (World Bank, 2016)

	Total	*With Guidelines*
Low-income countries	31	2 (6%)
Low-middle-income countries	51	12 (24%)
Upper-middle-income countries	53	26 (45%)
High-income countries	80	43 (53%)
All countries	215	83 (38%)

The messages contained in the guidelines present a great variance, both in term of contents and visualization style, hence there are no rules to be respected and each country has the freedom to create the guidelines that best fit their context. There are still many countries without published "official" dietary guidelines, defined as the ones officially promoted by the national governments, but with "quasi-official" or even "non-official" guidelines, elaborated respectively by institutions recognised by governments or academicians and scientific independent organizations. However, of 83 countries with guidelines, in 2016 only four contained references to environmental factors in their documents: Germany, Brazil, Sweden, and Qatar.

The national dietary guidelines of Italy and Brazil and their evolutionary pattern will be now considered. Despite being respectively a developed and developing country, the two countries look similar under both the profile of dietary patterns both following the principles of the Mediterranean Diet, and the obesity and overweight rates are in line compared to the neighbouring countries.

Italy published its most recent and fourth version of the national dietary guidelines "Linee Guida per una sana alimentazione" in 2019, following the previous edition of 2003. National dietary guidelines in Italy have been published since 1986. These guidelines are considered "quasi-official" by FAO since they were published by the institutional task of CREA Food and Nutrition Research Centre under the supervision of the Italian Ministry of Agriculture and Nutrition. The new version of dietary guidelines underlines the leading role that Italy must have in changing dietary habits towards more sustainable patterns since the country is home to the traditional Mediterranean Diet, generally seen as a proxy of a sustainable healthy diet. The document contains 13 directives divided into four blocks, and three more directives have been added because of the growing importance of studying this broad topic. These three new entries are: a 'more fruit and vegetables' section, a 'sustainability' section with the inclusion of 'how to behave' section, and a paragraph focused on the 'attention to diet' especially focusing on the use of supplements without scientific basis. According to the World Bank classification, which divides the world's economies into four groups based on the Gross National Income (GNI) per capita, Italy is a high-income country, and 7.7% of the population lives below the poverty line (Statista, 2018). In 2018, the overweight rate among the adult population was almost 60% and the obesity rate was 21% (CREA, 2019 & WHO, 2019), which are in line with the respective averages in Europe of 58% and 22,5% (Eurostat, 2019).

Brazil released its second and most recent version of the Dietary Guidelines for the Brazilian population in 2014, following the first edition of 2006. These guidelines are considered "official" by FAO since they were published by the Brazilian Ministry of Health and their commitments could be summarized in the followings: choose seasonal and local food, eat less red meat and processed food, do exercise, try to cook mostly at home, and eat together with other people. Apart from being one of the few countries that in 2016 included sustainability concepts in its dietary guidelines, Brazil introduced a new classification of food -NOVA- based on the impact of the whole food process from the cultivation to the final consumption (Monteiro et al., 2015). According to the World Bank classification, Brazil is an upper-middle-income country, and 9.2% of the population lives below the poverty line (Statista, 2018). Over the last years, the country has undergone economic, political, and socio-cultural transformations which changed the way of life of Brazilian people. The need for a new version of dietary guidelines comes also from the fact that Brazil is having an important increase in overweight and obesity rates in all ages and genders (Ministry of Health of Brazil, 2014). In 2018, the overweight rate among the adult population was 55,7% and the obesity rate was 19,8% (Ministry of Health of Brazil, 2019), which are lower than the respective averages in Latin America of 59,7% and 24,7% (OECD, 2019).

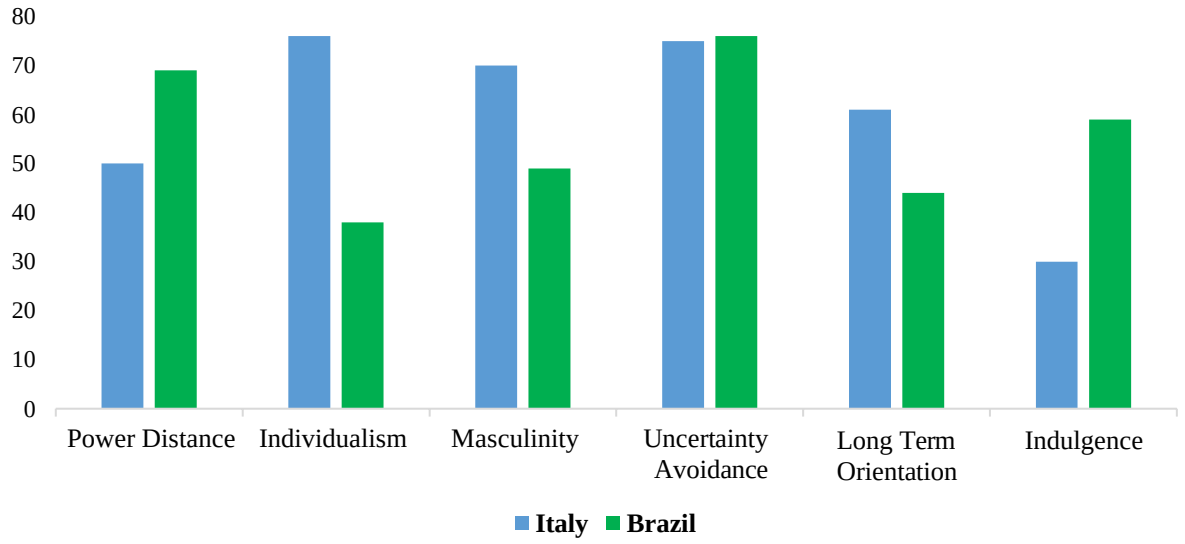
2.6.2 Hofstede model

The importance of the socio-cultural context in driving individuals' food choices has been already previously discussed and confirmed, therefore it is important to specify a model to detect the specific cultural distance and its effects among different countries. In this regard, Hofstede's cultural dimensions theory will be applied between Italy and Brazil.

The Hofstede's framework seeks to explain the cultural distance and the country cultural effect on the values of its citizens, and how these values translate into concrete behaviours. The theory was developed using a survey of employees conducted by IBM in 1967-1973. Hofstede's study includes 76 countries and regions listed on a scale that runs from 0-100 points on six different dimensions, and the country scores are meaningful only with a comparison with other countries (Hofstede et al, 2010). The six dimensions included in the model are listed in Figure 1, with the respective scores for Italy and Brazil. A description of the dimensions will follow, as well as an attempt to relate each dimension to the food choice process with the help of the previous

literature. However, Hofstede's study has a managerial point of view and it does not clearly explain the effects of culture on food choice.

Figure 1: Italy and Brazil compared on the six dimensions of the Hofstede's model



The six dimensions included in the Hofstede framework are:

- Power distance: It shows the degree of inequality, or equality, that people from the lower strata of society are able to accept. A high-level means that the society is undoubtedly hierarchical, while a low-level means that individuals question the authority and want the power more equally distributed.
- Individualism vs. Collectivism: It shows the degree to which people perceive the society as composed by individuals, who must only take care of themselves or their close family members, or composed by groups, where people can rely on cohesive in-groups who take care of them with unquestioning loyalty.
- Masculinity vs. Femininity: It reflects the gender distribution of values in a society. Masculinity represents the values of materialism, achievement, and heroism, while femininity means cooperating, caring and being modest.
- Uncertainty avoidance: It shows the degree to which individuals perceive future uncertainty and ambiguity. High levels in this index mean maintaining rigid mentality and behaviour, while weak levels reflect a greater acceptance of different opinions.
- Long-term orientation vs. Short-term orientation: This dimension reflects the influence of the past on the present and future challenges. A high score in this dimension means

a more pragmatic way of being, with the encouragement of efforts in modern education; a low score means the preference to maintain traditional norms.

- Indulgence vs. Restraint: This dimension shows the degree of freedom guaranteed to individuals from society to fulfil their desires. A high score means that people are relatively free to achieve gratification on their own, while a low score means that the society controls somehow the gratification of individuals through social norms.

According to the scores of the explanation of these dimensions, and using their relative scores (Figure 1), some conclusions on the cultural difference between Italy and Brazil are the following. Brazil has a higher score in power distance (69) than Italy (50), which means a more unequal society. However, there is evidence from the literature that a country with high scores of power distance and a great source of agricultural production, like Brazil, may have a higher tendency to consume mainly agricultural products (Karamustafa et al., 2016). Italy is a more individualistic society (76), while Brazil is collectivistic (38) which means that Italians give less importance to meal sharing than Brazilians (Osinga & Hofstede, 2004). Italy is also a more masculine society than Brazil (70 vs. 49), which means that food shopping is prevalently done by women, while in feminine societies it is done equally by both the genders (Hofstede et al, 2010). Both Italy and Brazil have high scores of uncertainty avoidance which shows the predisposition to consume less ready-prepared meals and more fresh fruit. Moreover, Italy is slightly more long-term oriented than Brazil. Finally, and most importantly, Brazil has a higher score in indulgence (59) than Italy (30). This dimension is the most related to food consumption among others. A higher score means lower consumption of fish, higher consumption of beer and soft drinks and especially a higher intake of junk food and consequently higher levels of obesity (Hofstede et al, 2010).

2.7 Hypotheses and framework

Based on the previously mentioned theoretical background, on the research question, and on the secondary objectives, the following hypotheses will be tested:

H_1: High level of physical activity leads to increased adoption of a sustainable diet.

H_2: High concern with body image leads to increased adoption of a sustainable diet.

H_3: High perception of benefits leads to increased adoption of a sustainable diet.

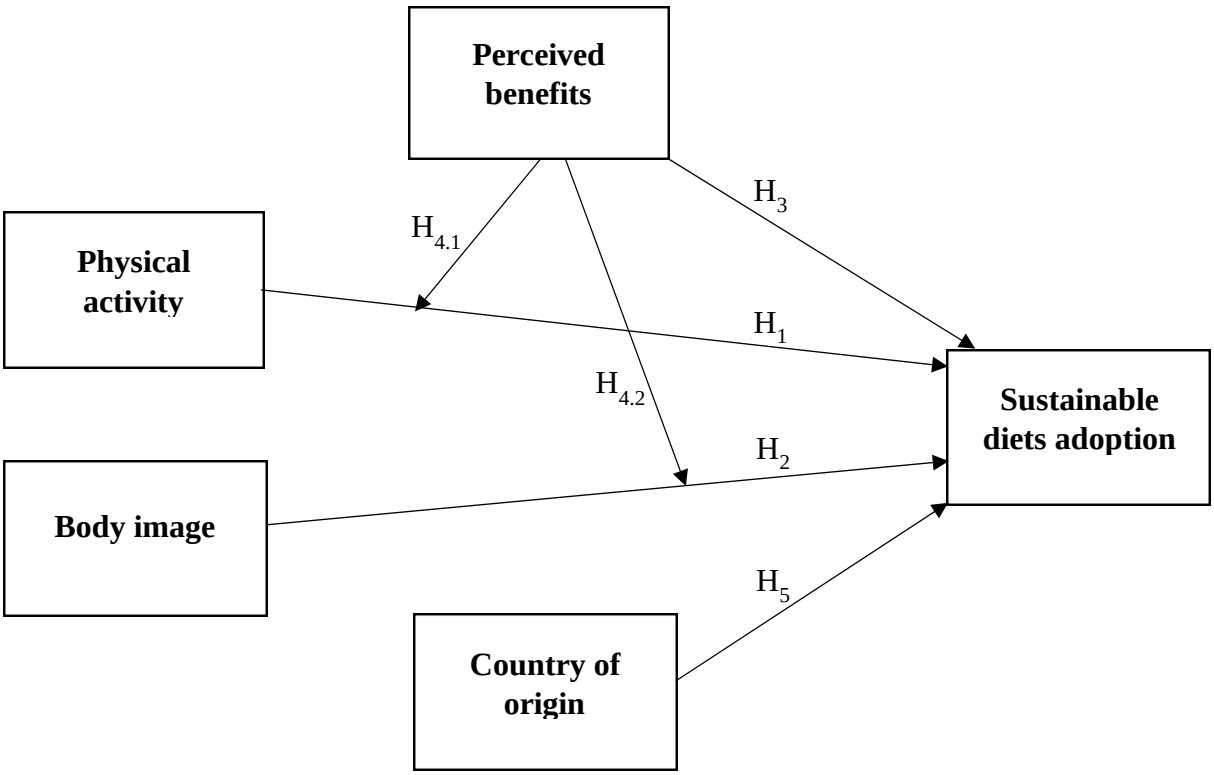
$H_{4.1}$: The perceived benefits of adopting a sustainable diet will strengthen the relationship between physical activity and sustainable diet adoption.

$H_{4.2}$: The perceived benefits of adopting a sustainable diet will strengthen the relationship between body image concern and sustainable diet adoption.

H_5: Individuals from a high-income country (Italy) are more likely to adopt a sustainable diet than individuals from an upper-middle-income country (Brazil).

The hypothesized relationships are presented in a visual framework (Figure 2).

Figure 2: Research framework



3. Methods

This section describes the methodology used for drawing up the study. The first subparagraph defines the research design and a description of the sample of study; the second illustrates the tools used to collect data; the third shows the data analysis procedures; finally, the fourth is dedicated to ethical considerations.

3.1 Research design and study population

An exploratory cross-sectional survey was conducted using Toluna, a global web-based consumer panel operating in 19 countries with more than 30 million consumers, that users can interface on a mobile application. The survey was sent to consumers in October 2020 through the digital platform and there has not been a direct interaction between participants and the author.

An initial pre-test was performed with 10 respondents, 5 from Italy and 5 from Brazil, comprised of both academics and nutrition professionals (technicians) to technically improve the questionnaire, as well as with individuals with no direct relationship with the subject, aiming to test the fluidity and applicability of the questionnaire. Once all suggested adjustments were made, the final version was sent to consumers.

403 adults aged more than 18 participated in the study, respectively 202 from Italy and 201 from Brazil. The adults selected belonged to all social classes and to different educational backgrounds. gender and geographical distributions were representatives for both the two countries.

3.2 Data collection

The questionnaire consisted of 40 questions, and it was submitted in both Italian (Appendix 1) and Portuguese versions (Appendix 2). The questionnaire was formulated from a review of the literature (Lea et al., 2006; Hall et al., 2017), and from questionnaires previously composed to examine the level of physical activity (Copeland et al., 2005), the body image perception (Evans & Dolan, 1993*)*, the benefits of switching to a plant-based diet (Fehér et al., 2020) and the behaviours towards more sustainable dietary patterns (Ahmed et al., 2019). A translation of the questionnaires was made with the help of native peers, as well as with the assistance of the authors of the respective original versions.

The first section of the survey included a brief presentation of the research objectives and a confirmation for participation. An attention check question was inserted to exclude careless respondents. The questionnaire contained questions distributed among four domains: levels of physical activity, body image concern, perceived benefits of adopting a sustainable diet and sustainable diets adoption.

Levels of physical activity

According to the literature, there is not a gold standard questionnaire when assessing physical activity (PA) and therefore there is not a model recommended above the others (van Poppel et al., 2010). This study is going to assess physical activity through the Physical Activity Questionnaire for Adults (PAQ-AD), one of the three versions of the questionnaires from the PAQ "family" for different populations (Copeland et al., 2005). The PAQ-AD is a self-report physical activity questionnaire composed of seven items coded on a 5-point Likert scale, and the final score is calculated as the average of the scores of each item (1 represents low PA and 5 represents high PA). Respondents are divided into four groups according to the scoring average: "low PA" (1-2), "low to moderate PA" (2-3), "moderate to high PA" (3-4) and "high PA" (4-5). The PAQ-AD analyses physical activities during spare time and in different moments of the day (morning, afternoon and evening), and on the weekend in the last seven days. Daily and weekly information may help to verify the compliance with international standards on PA. Among its limitations, the PAQ-AD does not provide information about time, frequency or intensity of physical activities. Moreover, its results depend on the moment the study is conducted, as the season influences the likelihood of practicing several physical activities, and on the geographical area of the sample, as the popularity of some sports is not equally distributed worldwide at the same level. Among its strengths, the PAQ-AD usesiconic moments of everyday life (lunch, evening) to recall memory of individuals, it is easy to administer, cost and time-efficient, and it presents normal distribution properties. The PAQ-AD has demonstrated adequate validity against accelerometers (Rodríguez-Muñoz et al., 2017).

Body image concern

Among the most influential body image (BI) measures, the Body Shape Questionnaires (BSQ) is one of the most frequently used in studies that compare international samples (Cooper et al.,

1986). The BSQ is a self-report measure of body dissatisfaction and it presents many versions (the original 34-item and shortened versions of 16-item and 8-item, all approved by the BSQ's copyright holders). All these forms showed reasonable psychometric properties. The BSQ has already been used in many cross-sectional studies for different countries' populations, and there is strong evidence for good internal consistency and good structural and content validity, both in the original and the shortened versions (Kling et al., 2019). In this study, levels of BI are assessed through the shortened BSQ-16B (Evans & Dolan, 1993), where each item is assessed in a 6-point Likert scale (with "Never" = 1 and "Always" = 6) and the overall score classifies individuals into four groups (Table 3). The body shape is a determinant of body image, for which changes in the body shape affect the BI perception. Previous studies assessed this association and found that body shape is an excellent determinant of BI (Ramos, 2017). For this reason, a concern about the body shape constitutes a relevant aspect of body image. In this study, no concern with body shape corresponds to no concern with BI, while a marked concern with body shape corresponds to marked concern with BI.

Table 3: Cutting points for the BSQ-16

16 item score	*Classification*
< 38	no concern with shape
38 to 51	mild concern with shape
52 to 66	moderate concern with shape
> 66	marked concern with shape

Perceived benefits of adopting a sustainable diet

Following the classification previously mentioned in par. 2.5 (Corrin & Papadopoulos, 2016), this study is evaluating the perceptions of benefits associated with a sustainable diet by individuals. The benefits assessed in the current research are exclusively the "perceived" ones, which are those based on consumer surveys from the previous body literature, excluding the benefits resulting from laboratory or clinical studies, defined as "objective" (Fehér et al., 2020).

For questions related to the perceived benefits, the scale varied according to the degree of agreement/disagreement of the respondent with the statements presented on an increasing 7-point Likert scale (from "Completely disagree" = 1 to "Completely agree" = 7). A classification

of the benefits can be found in table 4. The benefits are also divided according to the personal sphere in four “personal” items and four “altruistic” items.

Table 4: Classification of perceived benefits of adopting a sustainable diet

Type of Benefits		Benefit
Health	Personal	A sustainable diet decreases my saturated fat intake
Health	Personal	A sustainable diet prevents disease in general (e.g. heart disease, cancer)
Well-being and contentment	Personal	A sustainable diet helps me be more content with myself
Well-being and contentment	Personal	A sustainable diet reduces medical expenditures
Ethical and environmental	Altruistic	A sustainable diet increases the efficiency of economic resources
Ethical and environmental	Altruistic	A sustainable diet reduces the effect of global warming
Ethical and environmental	Altruistic	A sustainable diet helps the environment
Ethical and environmental	Altruistic	A sustainable diet helps animal welfare

Behaviours towards more sustainable dietary patterns

The adoption of a sustainable dietary pattern and the relative behaviours in this research are studied with the adaptation of the constructs used to evaluate national dietary guidelines (Ahmed et al., 2019). The reasoning for this choice is that if such aspects are important enough to be included in dietary guidelines, they are a good measure of assessing sustainable diets adoption. The 25 items measured are divided into the four key dimensions of sustainability (economic, ecological, health, socio-cultural and political). The behaviours taken into consideration encompass the entire relationship that individuals have with food: the decision-making process of purchase, the storage, the preparation and the waste management. The 7-point Likert scale was used since it is the most appropriate for surveys on consumer behaviour

(Hair et al., 2019). Apart from one block of 6 items (organized on a scale from “Never” = 1 to “Always” = 7), the score for questions assessing the adoption was organized on a scale of both negative and positive, as well as temporal (organized on a scale from “No, I do not perform this action” = 1 to “Yes, I have been doing it for a year or more” = 7).

3.3 Data analysis procedures

The responses were collected directly from the system and transferred to a Microsoft Excel spreadsheet. The data were subsequently analysed using IBM Statistical Package for the Social Sciences (SPSS) version 26.0.

Descriptive analysis of participants was done, calculating mean and standard deviation for continuous variables and the t-test for independent samples was applied for comparison of the means. The categorical variable ‘Country of origin’ (COO) was recoded as a dummy variable (1=Italy; 0=Brazil). Confidence intervals (95% CI) were calculated for each variable and $p < 0.05$ was considered statistically significant. All the variables were centred before the analysis because of the detection of multicollinearity with the variance inflation factor (VIF). A generalized linear model (GLM), a flexible version of the linear regression model which does not require a normal distribution of the errors, was used.

3.4 Ethical considerations

The study did not require approval from the Research Ethics Committee because it was an online collection through a platform where users register voluntarily. However, the Informed Consent Term was applied, establishing that the respondent did not take specific risks when participating in the research and that acceptance could be withdrawn at any time.

4. Results

4.1 Sample characterization

The sample of this study was composed of 403 individuals, respectively 202 from Italy and 201 Brazil. The questionnaire was completed by 100% of the respondents. 23 participants were excluded from the study because they experienced various health-related issues (coronavirus, asthmatic crisis, neuropathy, headache, flu, migraine) in the week before completing the questionnaire which prevented them from their normal physical activities' levels. 1 participant was excluded because of the attention check question. The final sample was composed of 380 adults, 191 from Italy and 189 from Brazil. The age distribution of the sample was characterized by a minimum age of 18 years and no maximum age. Although there was good age dispersion, more than 85% (n = 324) of respondents were aged less than 55. The sample was divided into three age groups as young adults (18-34), mature adults (35-54) and old adults (>55). Education level was based on the highest title of study obtained and classified into three categories: 'tertiary level' equivalent to at least degree at university; 'secondary level' equivalent to a classical or technical diploma at high school and 'primary level' corresponding to non-qualification (but least 9 years of mandatory education). Most of the respondents (94.42%) obtained at least an academic qualification. Descriptive statistics are shown in Table 5.

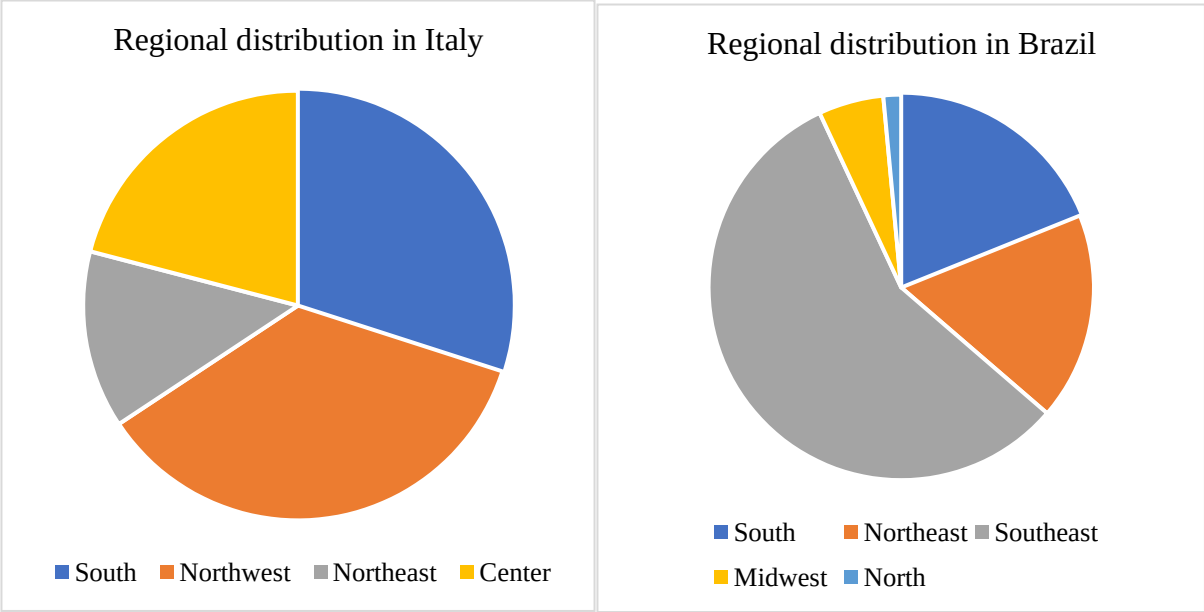
Table 5: Respondents profile, according to gender, age and level of education

	Italy		**Brazil**		**Total**	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Gender						
Female	99	51.83%	97	51.32%	196	51.58%
Male	92	48.17%	92	48.68%	184	48.42%
Age*						
Young adults	69	36.13%	82	43.49%	151	39.77%
Mature adults	91	47.64%	82	43.49%	173	45.53%
Old adults	31	16.23%	25	13.23%	56	14.74%
Level of education						
Primary level	10	5.24%	15	7.94%	25	6.58%
Secondary level	94	49.21%	62	32,8%	156	41.05%
Tertiary level	87	45.55%	112	59,09%	199	52.37%

*Minimum age prerequisite was specified for participation in the survey was 18.

There is a good and representative geographical distribution of the respondents in the regions of their countries of reference as it is shown in Figure 3.

Figure 3: Regional distribution of the sample in Italy and Brazil



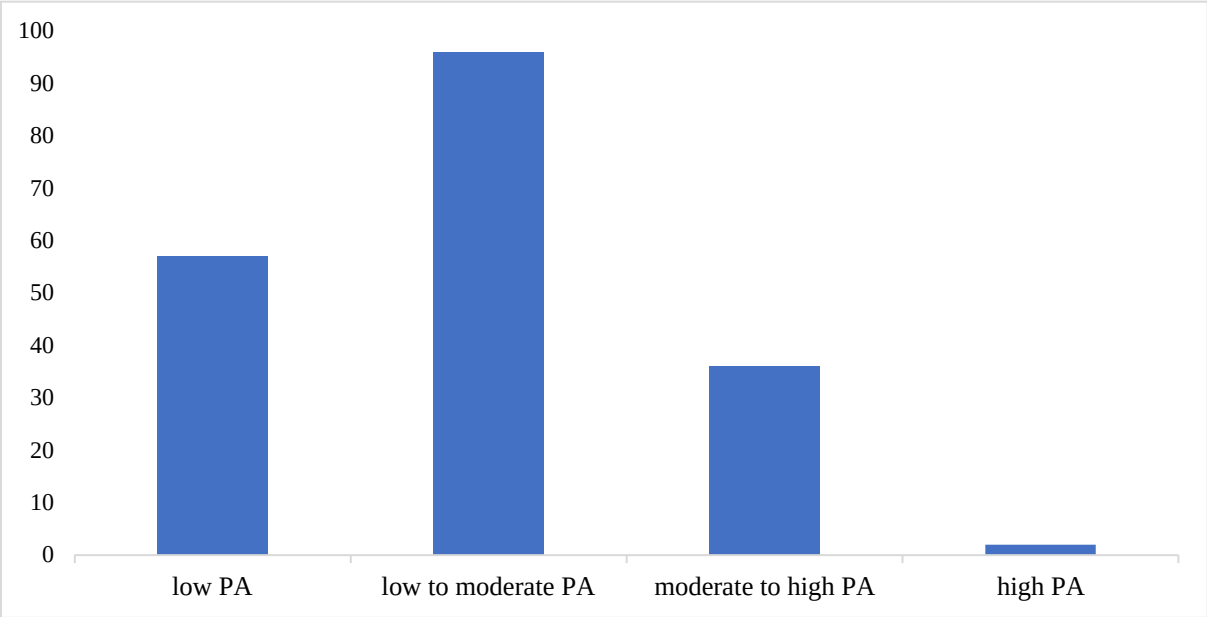
4.2 Physical activity and body image

Physical activity

Most of the respondents (76.05%) had low (27.63%) or low to moderate (48.42%) levels of physical activity (PA). The levels of physical activity do not strongly depend on gender as women were relatively more inactive than men in both countries, with a similar gender difference resulting in the two countries. Italians present on average lower levels of physical activity than Brazilians.

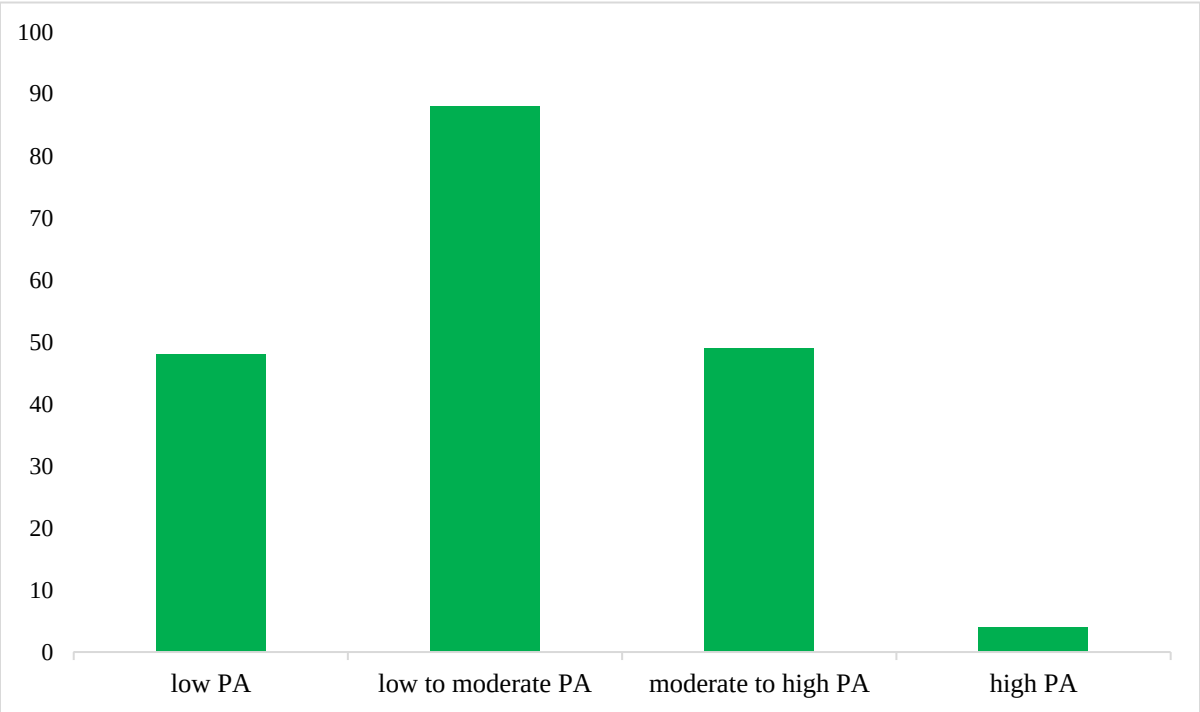
Italians have on average medium-low levels of physical activity ($\bar{x}$ = 2.36; σ = 0.74) with 80.10% of the sample belonging to the first two groups (Figure 4). 29.84% of Italians practice low physical activity, while 50.26% low to moderate. When we take gender into consideration, there is almost no gender difference in the levels of physical activity, as both male and female show mainly medium-low levels of physical activity with men ($\bar{x}$ = 2.40; σ = 0.68) being slightly more active than women ($\bar{x}$ = 2.32; σ = 0.80).

Figure 4: Physical activity in the Italian sample



Brazilians have on average medium-low levels of physical activity ($\bar{x}$ = 2.53; σ = 0.79) with 72% of the sample being under the average category, thus being 25% in "low PA" and 47% in "low to moderate PA" (Figure 5). When we take gender into consideration, there is almost no gender difference in the levels of physical activity, as both male and female show medium-low levels of physical activity with men ($\bar{x}$ = 2.59; σ = 0.84) being slightly more active than women ($\bar{x}$ = 2.47; σ = 0.73).

Figure 5: Physical activity in the Brazilian sample

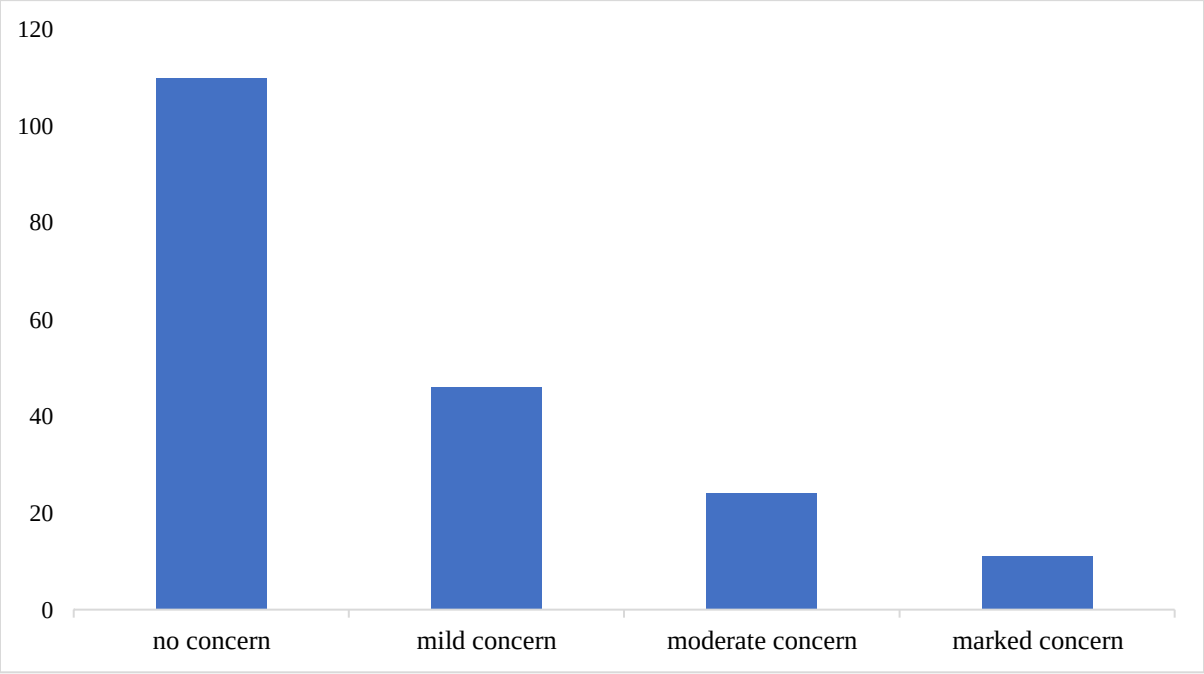


Body image

Most of the respondents (75.53%) had no concern (48.16%) or mild concern (27.37%) with their body image (BI). The level of the concern with body shape strongly depends on gender as women were relatively more concerned than men in both countries, with a higher gender gap resulting in the Brazilian sample. Italians present on average lower levels of BI concern than Brazilians.

Most of Italians do not present great concern with their body shape ($\bar{x}$ = 36.87; σ = 15.31) with more than half of the sample (57.60%) presenting no concern at all with body image. Only 18.32% of the respondents present a moderate or marked concern regarding their shapes (Figure 6). When we take gender into consideration, we observe a clear difference between men and women. Despite both genders have mainly no or mild concern with their body image, most of the men have no concern at all (66.30%), while women tend to have high levels of both no concern (49.49%) and mild concern (30.30%). Moderate and marked concerns are not frequent both in male adults (16.30%) and female adults (20.20%).

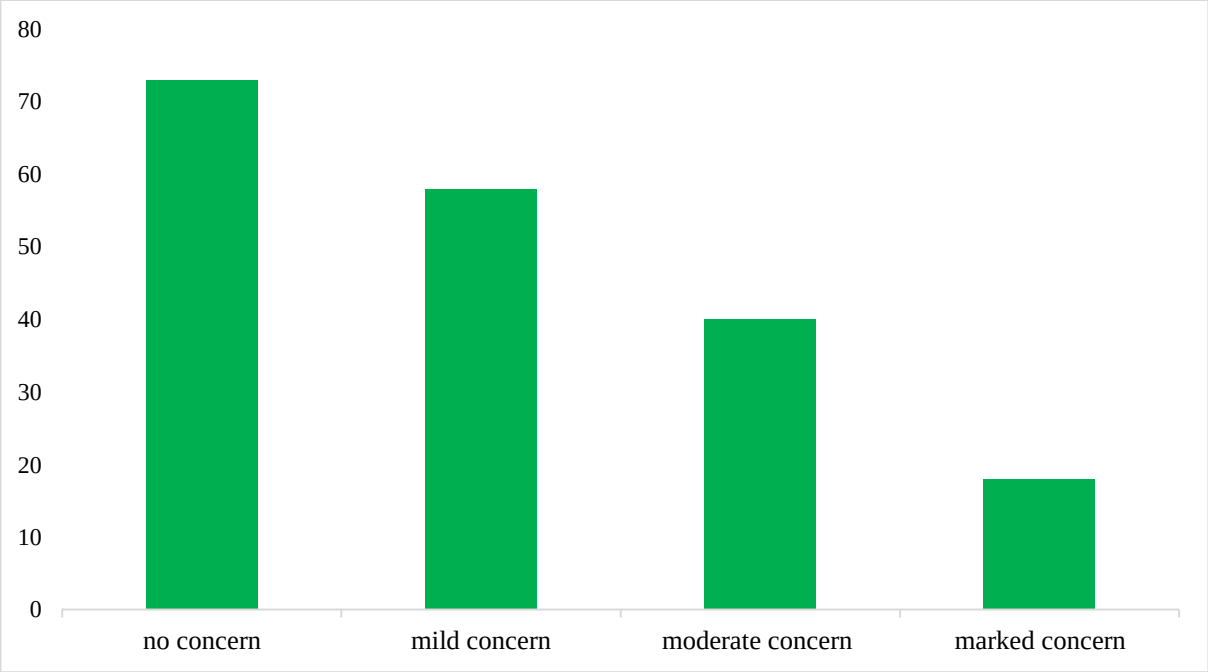
Figure 6: Body image concern in the Italian sample



Brazilians present on average a mild concern with their body image ($\bar{x}$ = 44.61; σ = 15.59) with most of the sample (38.62%) presenting no concern at all with body image, and a slightly smaller portion (30.69%) presenting mild concern. Only 30.68% of the sample presents a moderate or marked concern regarding their shapes (Figure 7). When we take gender into

consideration, we observe a clear difference between men and women. 39.13% of the Brazilian females have a moderate (26.09%) to marked (13.04%) concern with their body, while the frequency of men in the same categories overall is way lower at 26.87%, with a little part presenting marked concerns with their shape (7.47%).

Figure 7: Body image concern in the Brazilian sample



When considering age, the levels of physical activity and body image change according to the three age groups considered (Table 6).

About PA, there is a significant gap in PA levels according to age since there is an inverse relationship between age and PA levels. Young adults (aged 18-35) are the ones with the highest levels of PA (medium-high PA and high PA) both in Italy (23.18%) and especially in Brazil (37.28%) compared to the others (29.68% of the total respondents have medium-high or high levels of PA). On the other hand, mature adults and old adults are the less physically active (respectively 80.39% and 80.44% have low or medium-low levels of PA with a great prevalence of the low levels).

About BI, there is, similarly as before, a great difference when the respondents are analyzed according to their age as the data show an inverse relationship between age and concern with BI. Young adults are the group with the greatest concerns with their body shape compared to

the others (25.00% have a moderate concern with BI and 10.16% marked concern with BI). Body image concern reaches higher levels in Brazil, where 42.37% of young adults and 41,02% of mature adults have a moderate concern or marked concern with BI. On the other hand, 91.30% of old adults show no concern or mild concern with their body shape.

Table 6: Physical activity and body image frequency levels according to age

	Italy			**Brazil**			**Total**		
	18-34	35-54	>55	18-34	35-54	>55	18-34	35-54	>55
Physical Activity (PAQ-AD)									
Low PA	31.88%	28.35%	26.67%	22.03%	26.23%	18.75%	30.47%	28.10%	23.92%
Medium-low PA	44.93%	52.17%	56.67%	40.68%	52.46%	56.25%	42.97%	52.29%	56.52%
Medium-high PA	21.73%	18.48%	13.33%	35.59%	18.03%	25%	28.12%	18.39%	17.39%
High PA	1.45%	0%	3.33%	1.69%	3.28%	0%	1.56%	1.31%	2.17%
Body Image (BSQ-16B)									
No concern	49.28%	60.87%	66.67%	32.30%	36.07%	56.25%	41.41%	50.98%	63.04%
Mild concern	21.74%	26.09%	23.33%	25.42%	32.79%	37.5%	23.44%	28.76%	28.26%
Moderate concern	20.29%	9.78%	3.33%	30.51%	31.15%	0%	25.00%	14.38%	2.17%
Marked concern	8.70%	3.26%	6.67%	11.86%	9.87%	6.25%	10.16%	5.88%	6.52%

4.3 Perceived benefits of adopting a sustainable diet

The perception of the benefits related to sustainable dietary behaviour from the sample of reference was overall pretty high ($\bar{x}$ = 5.20; σ = 1.20), with some differences between Italians ($\bar{x}$ = 5.03; σ = 1.22) and Brazilians ($\bar{x}$ = 5.38; σ = 1.37). All the results of perceived benefits are shown in Table 7.

The main benefits perceived by Italians are related to the prevention of diseases ($\bar{x}$ = 5.25; σ = 1.17) and the greater contentment with yourself ($\bar{x}$ = 5.21; σ = 1.21). However, the possible decrease of global warming ($\bar{x}$ = 4.83; σ = 1.89), the increase in efficiency of economic resources ($\bar{x}$ = 4.91; σ = 1.14) and the decrease of saturated fat intake ($\bar{x}$ = 4.98; σ = 1.19) are not perceived as relevant benefits yet.

Similarly, Brazilians perceive as main benefits related to sustainable diets adoption the prevention of diseases ($\bar{x}$ = 5.85; σ = 1.12), the greater contentment with yourself ($\bar{x}$ = 5.73; σ = 1.17), and the reduction of social expenditures ($\bar{x}$ = 5.66; σ = 1.24). On the other hand, the possible decrease of global warming is not perceived as a relevant benefit yet ($\bar{x}$ = 4.85; σ

= 1.63).

Table 7: Perceived benefits of adopting a sustainable diet

Items of measurement	Italy		Brazil		Total	
	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
A sustainable diet prevents disease in general (e.g. heart disease, cancer)	5.25	1.13	5.85	1.12	5.55	1.12
A sustainable diet helps me be more content with myself	5.21	1.21	5.73	1.17	5.47	1.19
A sustainable diet reduces medical expenditures	5.01	1.20	5.66	1.24	5.34	1.22
A sustainable diet decreases my saturated fat intake	4.98	1.19	5.40	1.23	5.19	1.21
A sustainable diet helps animal welfare	5.03	1.17	5.16	1.66	5.10	1.42
A sustainable diet increases the efficiency of economic resources	4.91	1.14	5.27	1.30	5.09	1.22
A sustainable diet helps the environment	5.04	1.33	5.08	1.62	5.06	1.47
A sustainable diet reduces the effect of global warming	4.83	1.39	4.85	1.63	4.84	1.51

The full question asked was: "Some people believe that following a sustainable diet brings specific benefits. How much do you agree with the following statements?"

4.4 Adoption of sustainable diets

The level of adoption of sustainable food behaviours from the sample of reference was moderately high ($\bar{x}$ = 4.65; σ = 1.94), with no relevant differences on average between Italians ($\bar{x}$ = 4.69; σ = 1.89) and Brazilians ($\bar{x}$ = 4.62; σ = 1.99). All the results of behaviours are shown in Table 8.

The main behaviours adopted by Italians are choosing seasonal foods ($\bar{x}$ = 5.74; σ = 1.54), trying to follow a varied diet ($\bar{x}$ = 5.55; σ = 1.69) and give preference to natural and minimally treated food ($\bar{x}$ = 5.35; σ = 1.70). However, Italians are not trying to reduce the intake of animal source food ($\bar{x}$ = 3.63; σ = 2.21), they do not pay attention if the food is produced far and it needs to be transported for long distances ($\bar{x}$ = 3.92; σ = 2.13), and finally do not avoid making time-consuming microwave preparations ($\bar{x}$ = 3.96; σ = 2.24).

Brazilians most frequent behaviours regard the planning of food to be prepared based on the number of people eating ($\bar{x}$ = 5.46; σ = 1.58), the choice of seasonal foods ($\bar{x}$ = 5.40; σ = 1.74) and the attempt to follow a varied diet ($\bar{x}$ = 5.58; σ = 1.68). On the other hand, Brazilian do not

pay great attention if the company that produces food uses synthetic additives or pesticides ($\bar{x}$ = 3.75; σ = 2.24), do not care if the food is produced far and needs to be transported for long distances ($\bar{x}$ = 3.32; σ = 2.13), and they are not reducing the consumption of animal source products ($\bar{x}$ = 3.57; σ = 2.17).

Table 8: Questions regarding sustainable diets adoption, and its respective average answers

Items of measurement	Italy		Brazil		Total	
	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
Make a shopping list, to avoid buying something unnecessary or in excess. (1)	4.69	1.61	5.04	1.80	4.87	1.71
Avoid storing large quantities of food in the pantry so that there is no risk of deterioration. (1)	4.54	1.42	5.00	1.66	4.77	1.54
Plan the amount of food to prepare based on the number of people eating. (1)	4.99	1.48	5.46	1.58	5.23	1.53
Avoid having large quantities of frozen food, to not increase the energy expenditure of the freezer. (1)	4.19	1.60	4.60	1.86	4.39	1.73
Avoid making time-consuming microwave preparations. (2)	3.96	2.24	4.74	2.23	4.35	2.24
Make full use of food (stalks, peels, leaves, etc.). (2)	4.22	2.06	4.63	2.04	4.42	2.05
Freeze foods that are about to go bad. (2)	4.31	2.27	4.81	2.09	4.56	2.18
Freeze leftover food for later consumption. (2)	5.10	1.98	4.97	2.12	5.03	2.05
Using already prepared leftover food in new preparations. (2)	5.15	1.93	5.24	1.96	5.20	1.95
Food produced according to agroecology (ecologically sustainable, economically efficient and socially just logic). (3)	4.09	1.85	4.31	1.96	4.20	1.91
Food produced with clean energy and "green" technologies. (3)	4.03	1.82	4.34	1.94	4.18	1.88
Seasonal foods. (3)	5.74	1.54	5.40	1.74	5.57	1.64
The company that produces the food uses synthetic additives or pesticides. (3)	4.15	2.17	3.75	2.24	3.95	2.20
Food grown in neighbouring regions (local/regional). (3)	5.28	1.67	4.82	2.01	5.05	1.84
Food produced outside the country/region where you live and then transported over long distances. (4)	3.92	2.13	3.32	2.13	3.62	2.13
The company that produces the food does not respect animal rights. (4)	4.38	2.02	4.30	2.16	4.34	2.09
The company that produces the food does not respect human/workers' rights or working conditions. (4)	4.60	1.83	4.46	2.17	4.53	2.00
Try to follow a very varied diet. (5)	5.55	1.69	5.58	1.68	5.56	1.69
Reduce the size of food portions. (5)	4.65	1.91	4.81	1.99	4.73	1.95

Avoid ultra-processed foods (industrial formulations composed entirely or mainly of substances extracted from food, derived from parts of other foods, or synthesised in the laboratory). (5)	4.74	2.02	5.17	1.91	4.96	1.97
Give preference to natural and minimally treated food. (5)	5.35	1.70	5.36	1.88	5.35	1.79
Maintain a dietary model that meets personal, cultural and traditional aspects, not just nutritional needs. (5)	5.17	1.91	4.72	2.00	4.94	1.95
Reduced consumption of red meat (meat of all mammalian species). (6)	4.37	2.24	4.14	2.30	4.26	2.27
Reduced intake of food of animal origin in general (all types of meat, eggs and dairy products). (6)	3.63	2.21	3.57	2.17	3.60	2.19

The full questions asked were:

1. When planning food purchases and managing food stored in the home, are you in the habit of taking the following actions?
2. When you prepare meals, do you usually take the following actions?
3. When you buy food for your consumption and your family, do you prioritise the following aspects?
4. Are any of the following features preventing you from buying a particular food?
5. With regard to your eating habits, do you take the following actions?
6. In relation to the usual consumption of food of animal origin, have you made any of the following changes?

4.5 Generalized linear model

A generalized linear model (GLM) was run and six hypotheses were tested. The equation of the model is the following:

$$ASD = \beta_0 + \beta_1 \text{PA} + \beta_2 \text{BI} + \beta_3 \text{BENE} + \beta_4 \text{BENE} * \text{PA} + \beta_5 \text{BENE} * \text{BI} + \beta_6 \text{COO} + \varepsilon$$

The variables included in the model are:

ASD = Adoption of sustainable diets (Y)

PA = Physical activity (X_1)

BI = Body image (X_2)

BENE = Perceived benefits (W)

COO = Country of origin (X_3)

The results of the model and the hypotheses test are shown in Table 9.

Table 9: Hypotheses test of the GLM

Hypothesis	Relationship	β	SE	Wald Chi-Square	p-value
H_1	PA → ASD	.334	.0621	28.973	***
H_2	BI → ASD	.000	.0031	.013	NS
H_3	BENE → ASD	.588	.0482	148.583	***
$H_{4.1}$	BENE*PA → ASD	-.049	.0592	.676	NS
$H_{4.2}$	BENE*BI → ASD	-.002	.0030	.631	NS
H_5	COO → ASD	.211	.0955	4.898	**

The significance level: NS=not significant, **p < 0.050, ***p < 0.001.

After having run an omnibus test, the Likelihood Ratio (LR) Chi-Square was calculated, and overall, the model resulted in statistically significant G^2 (6) = 178.927, p < 0.001.

Three out of the six initial hypotheses were statistically significant with p < 0.050:

- The model predicts that for a 1 unit increase in PA (β = .334; Wald χ2 (1) = 28.973; p < 0.001), the adoption of sustainable diets increases by .334 units, holding fixed the other variables.
- The model predicts that for a 1 unit increase in benefits perceived (β = .588; Wald χ2 (1) = 148.583; p < 0.001), the adoption of sustainable diets increases by .588 units, holding fixed the other variables.
- The model predicts that Italians, COO=1, (β = .211; Wald χ2 (1) = 4.898; p < 0.050) adopt sustainable diets more than Brazilians, COO=0, holding fixed the other variables.

An independent sample t-test was conducted to compare independent variables' measures between Italians and Brazilians.

- For a t = -2.189 at p < 0.050 we can reject the null hypothesis which would state that the level of PA is the same for Italians and Brazilians in the population from which the sample was drawn. With a 95% CI (-.3286; -.01762) it can be affirmed that Brazilians are more physically active than Italians.
- For a t = - 4.882 at p < 0.001 we can reject the null hypothesis which would state that the level BI concern is the same for Italians and Brazilians in the population from which

the sample was drawn. With a 95% CI (-10.857; -4.622) it can be affirmed that Brazilians are more concerned with BI than Italians.

- For a $t = -3.341$ at $p < 0.050$ we can reject the null hypothesis which would state that the level of perceived benefits of adopting a sustainable diet is the same for Italians and Brazilians in the population from which the sample was drawn. With a 95% CI (-.532; -.138) it can be affirmed that Brazilians have a higher perception of benefits related to sustainable diets than Italians.

5. Discussion

This exploratory research studied how PA and BI, together with the perception of benefits, influence the adoption of sustainable diets in Italy and Brazil. The study contained six hypotheses and three of them (H_1, H_3, H_5) were confirmed. A discussion of the results of the hypotheses tests will follow with reference to the literature. The first subparagraph focuses on the implications of the current study, while the second subparagraph on its limits and further research.

The results from H_1 show that PA levels, despite not having reached high scores among the two populations, have a significant and positive relationship with the adoption of sustainable dietary behaviours. No previous studies assessed the effect of the level of PA on a wide range of sustainable practices related to food. Most of the past literature assessed the relationship between PA and nutrition under the point of view of the nutrient properties of food and its consequences on training adaptation and performance (Burd et al., 2019; Kårlund et al., 2019). Another group of the past literature suggested that athletes and physically active individuals lead a healthier lifestyle than most of society since they do not often burden the health care system (Meyer & Reguant-Closa, 2017). Hence, these individuals should also lead a more sustainable lifestyle under the nutrition point of view.

Results from the PAQ-AD questionnaire are in line with previous studies which assessed PA through it (Gaddad et al., 2018). The sample had generally low-to-moderate levels of PA ($\bar{x} = 2.44$; $\sigma = 0.77$), with men generally being more active than women, and with no great difference between Italians and Brazilians. Gender difference in PA levels is in line with most of the previous studies (Korn et al., 2013; Gaddad et al., 2018). Age is an important factor to consider when analysing PA scores since a remarkable difference is shown among young adults, who show medium levels of physical activity, and mature and old adults, who both present really low levels of PA.

The results from H_2 show that BI does not have a significant nor a positive or negative relationship with the adoption of sustainable dietary behaviours. Same as for the previous hypothesis, no prior studies assessed the effect of BI concern on a wide range of sustainable practices related to food. There is not a common opinion in the previous literature regarding BI dissatisfaction and weight management behaviours. Most of the prior studies state that BI dissatisfaction is a strong predictor of weight management behaviours, and in particular that BI

dissatisfaction is associated with the intention of changing lifestyle (Bouzas et al., 2019; Kuk et al., 2009), while a more limited part of the literature affirms that a negative BI leads to eating disorder symptoms (Korn et al., 2013; Berg et al., 2009). This study does not solve this controversy, similarly to other recent studies (Jankauskiene & Baceviciene, 2019). One of the factors that have not been considered in this research and that could have led to non-significant results of BI concern on the adoption of sustainable dietary behaviours might be having not considered the misperception of their BI by individuals. Indeed, the correct body shape is usually misperceived, and it might instigate weight management actions (Almenara et al., 2019).

Results from the BSQ-16B questionnaire confirm the previous studies that assessed the BI dissatisfaction. Brazilians present on average higher concern with their BI than Italians, especially for young and mature adults. This result is line with previous studies, as Brazilian culture glorifies aesthetic standards, and the body plays a fundamental role in having a successful life (Laus et al., 2014). Overall, the sample has a mild concern with BI ($\bar{x}$ = 40.72; σ = 15.91). The BI dissatisfaction strongly depends on gender, as women have always evaluated appearance as a more important factor than men (Bouzas et al., 2019). Once again, age turns into an important variable and BI concerns diminish with the increase of age. This is why most of the previous studies of BI in the literature refer to adolescents (Moehlecke et al., 2018).

The results from H_3 show that the perceived benefits of adopting a sustainable diet have a significant and positive relationship with the adoption of sustainable dietary behaviours. The sample has an overall high recognition of the benefits linked to sustainable dietary habits ($\bar{x}$ = 5.20; σ = 0.99), with Brazilian showing a constant higher perception than Italians. Gender does not seem to be a noteworthy variable, but women ($\bar{x}$ = 5.30; σ = 0.96) show a higher perception of benefits than men ($\bar{x}$ = 5.10; σ = 0.97).

These results also support the findings from past research on the expectation of healthier outcomes by reducing meat consumption (Lea et al., 2006). Furthermore, consumers are used to evaluating more precisely the self-impacts of their food choices compared to the external one (Lea & Worsley, 2008). The “personal” benefits, belonging to the health and well-being and contentment categories, are perceived higher ($\bar{x}$ = 5.39; σ = 1.18) than the “altruistic” benefits, more related to ethical and environmental issues ($\bar{x}$ = 5.02; σ = 1.41). To be precise, on the one hand, the respondents strongly believe that the adoption of sustainable behaviours can prevent diseases ($\bar{x}$ = 5.55; σ = 1.12) and help you to be more content with yourself ($\bar{x}$ = 5.47; σ = 1.19).

On the other hand, the sample seems to misestimate the environmental effects of their food choices, not recognizing global warming as a consequence of food choices ($\bar{x}$ = 4.84; σ = 1.51). This is the confirmation to the previous literature which affirms that there remains still plenty of opportunities to connect individuals' attitudes to the effective behaviour in respect of environmental issues related to food consumption, as individuals maintain psychological distance to the topic (Loy & Spence, 2020). To increase the level of adoption of sustainable and healthy dietary patterns, consumers need to be properly assured that changes in their behaviours reflect in positive benefits for the environment as well (Siegrist et al., 2015).

The results from the hypotheses $H_{4.1}$ and $H_{4.2}$ show that the perceived benefits are not moderating the effects of respectively PA and BI on the adoption of sustainable diets. This means that on average the level of ASD for people with different levels of PA or BI concern does not change with different levels of BENE. Despite the respondents recognizing the importance of the benefits, especially of the ones related to the personal sphere, these are not able to increase the levels of adoption when they act as a moderator of PA and BI.

The results from H_5 confirm that Italians have higher levels of adoption of sustainable dietary behaviours than Brazilians. The comparison of a high-income country and an upper-middle-income country confirms the previous body literature about food affordability and accessibility. All the countries present on average higher prices for nutritious food than for energy-dense food, which explains why low-income countries are usually not positively related to healthy food consumption (FAO, 2019). However, Brazilians present on average high levels of ASD and this study does not confirm the gap between Italy and Brazil that the Hofstede's model dimension 'indulgence' shows in terms of higher intake of junk foods. Considering that both Italians and Brazilians can be considered as 'sustainable diets friendly', another factor of distinction might be the popularity of the Mediterranean Diet in Italy, now equated to a sustainable diet.

The most frequent sustainable behaviours recognized by the respondents belong to different areas of nutrition, from the preparation of meals to the habitual purchase of foods. The most frequent behaviour is choosing seasonal food ($\bar{x}$ = 5.57; σ = 1.64). This choice could be due to a better flavour, or because the food has more nutrient properties, or because it is more cost-efficient from both the supply and demand side, or finally because it is environmentally friendly not requiring the presence of greenhouses for the production. For similar reasons, giving preference to natural and minimally treated foods is a frequent behaviour in the sample ($\bar{x}$ =

5.35; σ = 1.79). Respondents also give importance to eat a balanced diet ($\bar{x}$ = 5.56; σ = 1.69) which includes a variety of foods from different groups. Finally, most of the respondents use to plan the amount of food that must be prepared according to the number of people eating ($\bar{x}$ = 5.23; σ = 1.53) to avoid excessive food waste.

Among the less common behaviours adopted, two belong to the supply side. Consumers do not pay much attention that food is not produced locally and transported over long distances ($\bar{x}$ = 3.62; σ = 2.13) and that the company which produces the food uses synthetic additives or pesticides ($\bar{x}$ = 3.95; σ = 2.20). At the same time, the reduced intake of animal-sourced food, including its derivatives as eggs and dairy, is the behaviour with the lowest score ($\bar{x}$ = 3.60; σ = 2.19). However, the results from the reduced intake of red meat present remarkable higher scores ($\bar{x}$ = 4.26; σ = 2.27). Despite both Italy and Brazil being meat-based countries, there is a willingness of the respondents to reduce their consumption of meat. In this sense, it would be interesting to understand if the respondents are aware of the environmental effect of meat production on global warming.

5.1 Study implications

The results show implications for policymakers, academicians and marketers who have an interest in understanding the individuals' intention and behaviour to adopt no meat and sustainable dietary patterns. A possible contribution is given to the marketing literature as the current study is highlighting emerging consumers' patterns that were still unnoticed. Indeed, the increasing environmental consciousness may influence new behaviours, affecting product management, brands equity and retail practices (van Giesen & Leenheer, 2019). Another relevant possible contribution could be given to the sustainability literature since this study could guide future actions to diminish psychological distance to ecological issues when deciding on dietary changes (Burlingame & Dernini, 2012).

A primary contribution is given to the literature. Previous studies which have explored the motivations of food purchase behaviours in emerging economies (Basha & Lal, 2019; Yadav et al., 2016) and developed economies (Tam et al., 2016) did not consider the effects of PA and BI concerns and the moderating effect of the benefits perceived on the adoption of sustainable diets. There are studies which confirmed a positive correlation between perceived benefits and the intention to reduce meat consumption (Cheah et al., 2020) and others which found a positive effect of exercise on the consumption of fruits and vegetables (Jayawardene et al., 2015).

Furthermore, a recent study already confirmed that BI concerns do not significantly promote nor prevent healthy behaviours (Jankauskiene & Baceviciene, 2019). In this sense, the current study extends the previous knowledge applying for the first time a more comprehensive framework to evaluate sustainable dietary patterns. Moreover, this study is exploring for the first time the levels of PA and BI concerns in adult populations in Italy and Brazil, that were both already assessed for the adolescents' population.

The findings of the present study have important implications for public health, health promotion, and education under many points of view. This research is highlighting that few adults are practicing PA, but that PA leads to the adoption of sustainable dietary behaviours. To prevent eating disorders and obesity, that generally lead to cardiovascular and NC diseases, and to increase healthy and sustainable practices it becomes paramount to stress out the relationship between daily food choices, health, and sustainability. In this sense, individuals who play a remarkable role in our society as athletes, or physically active people in general, should teach to the next generations the values of sustainability. Particular attention should be given to young adults as those with the highest concern with their body image but highest level of physical activity; a possible strategy to convince them do adopt sustainable diet may involve gym or sports shop. As it regards old adults, public bodies should enhance the adoption of sustainable diets as it brings specific personal benefits related to health, well-being and contentment.

Finally, the results also highlighted that adults have a high perception of benefits related to sustainable dietary choices, especially the ones related to the personal sphere. It may be that individuals are not associating their personal choices of dietary changes to the external environmental consequences. This implies that a major focus on the prevention phase should be made by private and public institutions to contribute to the preservation of the environment. A subsequent managerial implication could be the creation of campaigns and marketing messages able to directly reach the population to improve the food literacy of meat consumption, trying to reduce the portions or at least the consumption frequency. For example, activities such as consumer segmentation and profiling should be implemented to detect the specific problems of each cluster. Key opinion leaders, as high importance celebrities or famous athletes, should act as models creating global awareness around vegan, plant-based and vegetarian dietary options.

5.2 Limitations and future research

This research is not out of limitation. First, the study is limited to the geographic regions of Brazil and Italy, a developing and a developed country. It is not realistic to generalize the results of this research to all the comparisons between developed and developing countries, whether they are European and Latin American. Further researches may be directed towards other regions in the neighbouring countries to gain a more comprehensive understanding of consumers' reasons for and against adopting plant-based and sustainable diets. Also, similar research in neighbouring countries that share cultural, and to some extent geographical similarities, with Brazil and Italy could allow scholars to develop a regionally grounded profile of vegetarian consumers both in Latin America and in Europe.

These are the reasons why a new study is going to be launched in the next months including four more European countries as France, Spain, Germany, and the United Kingdom. Thanks to this, there will be the possibility to have a larger sample size of around 1200 respondents, which would provide more reliable results, reducing the sampling error, and with greater statistical power and precision.

This could extend the current theoretical scope of knowledge. Moreover, the scope should also be extended inside the sample, identifying the respondents in areas that are more urbanized or more rural. Thanks to this, it would be possible to identify more context-specific motives, barriers, awareness, and intentions specifically related to the context of living. The sample used for this study is well distributed in terms of gender diversity, age, and regional dispersion. However, conducting similar studies with a larger sample and including other socio-economic variables, like marital status, familiar income, and the number of members in the family, could assist future research in developing targeted strategies to induce further demand for such food items among different segments of the consumer market. Besides, given its nature of exploratory study, this research did not focus on a specific sample of plant-based or vegetarian groups of consumers, nor focused on exclusively physically active individuals.

Regarding the questionnaires, as previously mentioned, the results of the PAQ-AD and the BSQ-16B have certainly been influenced by the historical moment we are living. It has been demonstrated how during the pandemic of Covid-19 the levels of PA have decreased (Tison et al., 2020), and this had a consequent effect on levels of PA and on BI satisfaction as well.

Moreover, the PAQ-AD is a questionnaire whose results are affected by the time of the year it is administered and by the geographical respondents live in. Not all the sports mentioned in the survey can be practiced with the same frequency in every season, and not all the sports are similarly popular worldwide. Additionally, both questionnaires have self-report measures which if on one side are easier to administer, on the other side they might suffer from some limitations. The main disadvantage is that respondents may not answer truthfully to the questions, especially to the sensitive questions like those related to BI, because of a 'social desirability bias', which pushes them to answer in a socially acceptable way. Another potential issue could be the 'response bias' for which individuals tend to respond in a way regardless of the question.

Further research will be conducted in the next months expanding the scope to four new European countries. Since BI concern in this study did not turn to be significant, it will be interesting to understand if this is due to some characteristics of the sample or other factors. It will be also crucial to understand how, and if, modifying the framework or inserting an experiment to prove the relationships already found in this research will help to improve the findings. Finally, since the personal BI is usually misperceived and such misperception strongly influences consequent weight management actions (Almenara et al., 2019), it might be of great importance to categorize the respondents according to their weight including their body mass index (BMI) in the next studies. Being overweight or obese could imply different attitudes toward healthy nutrition compared to being normal weight (Jankauskiene & Baceviciene, 2019).

6. Conclusion

Over the last decades, society has amplified the discussions on sustainability especially referring to how our production systems and individuals' choices are damaging the world we live in through their daily actions. In this context, the rise of the concept of a 'sustainable diet', safe and healthy and respectful of the environment, is moving the discussions on sustainability to the whole food industry and to the individuals' dietary habits. The focus of the studies about sustainable diets adoption is the consumers, whose behaviour is studied to understand the mental paths of decision making of individuals. Given these premises and to contribute to this goal, this research took a quantitative approach to understand how the adoption of a sustainable diet is influenced by precise conditions like the engagement in physical activities and the concern with the image of one's own body.

The current study, despite being exploratory, has shed light on several research questions. People have an overall low engagement in physical activity, especially women, with no great differences between Italy and Brazil. The level of concern with body image is mild, higher for women, and particularly higher for the Brazilians. Both the levels of physical activity and the concern with body image decrease with the age increasing. The perception of benefits related to sustainable diets adoption is high overall, with greater recognition of the self-related benefits over the environmental and ethic benefits. Brazilians show a higher perception of benefits. People have a moderate-to-high adoption of sustainable dietary behaviours, with Italians and Brazilians showing similar habits among the phases of food procurement and preparation, and with Italians having an overall higher level of adoption.

Being engaged in physical activities has proved to be a factor that positively influences the adoption of sustainable dietary behaviours, confirming that active individuals lead a healthier lifestyle than most of society. In contrast, having a concern with the body image does not to reflect in adopting sustainable diets, partially mirroring the debate already shown in the literature and leaving space for reflection. Finally, having a high perception of the benefits of adopting a sustainable diet can increase the adoption of sustainable diets, but the benefits do not moderate the relationships between physical activity and body image and adoption.

This study has explored a new field and has proved half of the six hypotheses initially stated. However, there is still a lot of space for future investigation, with particular attention to the relationship between physical activity and the body image concern and the adoption of

sustainable diets. In this sense, the comparison with other countries could add further insights on a complex phenomenon with a lot of social, economic and cultural facets.

The results of this research lead to several implications and discussions. A primary contribution is given to the marketing and sustainability literature providing emerging consumers' patterns that were still unnoticed as well as insights to guide future actions to diminish psychological distance to ecological issues when deciding on dietary changes. Thus, consumer segmentation could ensure the adaptation of local policies. Moreover, the findings of this study provide important indications for public health and health promotion. The engagement of the adult population on physical activities is low, as well as it is the environmental awareness of food choices. These highlights show how it is paramount to stress out the relationship between daily food choices, health, and sustainability.

What remains the biggest challenge to increase sustainable food consumption is changing the mindset of individuals regarding environmental problems. In this way, a coordinated action of public bodies, health and environmental organizations, and businesses is necessary to guide the transition of individuals towards a healthier lifestyle driven by a more sustainable consumption. Educational programs, especially directed to young people through the development of awareness-raising campaigns, must focus on sustainable diets as a win-win solution for the environment and the consumers. Indeed, through the alignment of a critical mass of actors (media, NGOs, governments, and private companies) it can be effectively reached a large mass of consumers and underlined the urgency to switch current dietary patterns highlighting the principal benefits of a sustainable diet for producers, consumers and the environment.

Individuals adopt healthy lifestyles and balanced eating habits when they have a good knowledge of them but, as it is known, in the food system there is a strong information asymmetry. In this context, the role of public bodies is to adequately inform individuals so that they can make rational choices. In Italy and Brazil the rates of overweight status and physical inactivity have been increasing over the last decades following the so-called 'globesity' trend, and this highlights the need to take immediate action. Both countries recognized the urgency to stimulate individuals towards more sustainable dietary choices and they recently renewed their national dietary guidelines.

In Italy, the promotion of healthy nutrition patterns is under the supervision of CREA (*Centro di ricerca Alimenti e Nutrizione*), research institute supervised by the Ministry of Agriculture,

Food and Forestry Policies. Italy has added a ‘sustainability’ section in the national dietary guidelines only last year, and it can be considered a latecomer in this regard. For this reason, CREA has worked intensively in the last years to strengthen the bond with FAO to create appropriate dietary guidelines. In the strategic agenda 2018-2027, CREA wants to promote the Mediterranean Diet adoption and track the obesity increase and physical activity engagement of the Italian population. Moreover, CREA supports cooperation with the European Union institutions for the dissemination of an information campaign of sustainable dietary habits on a European level.

Brazil is one of the first four countries worldwide that included sustainability into its national dietary guidelines. Thanks to this early adoption, the environmental consciousness of Brazilians increased as it is demonstrated by having a higher perception of the benefits related to sustainable diets than Italians. The promotion of healthy nutrition policies is under the direct supervision of the Ministry of Health. In a context marked by great inequality and difficulties in access to food, Brazil has had a more centralized approach in developing nutritional directives. The main actions undertaken have been an expansion of social protection programmes and the creation of a National Policy for Food and Nutritional Security (*Politica Nacional de Segurança Alimentar e Nutricional*) that addresses malnutrition through sustainable food policies.

Even though both countries have been making efforts in recent years, they have not been able to achieve satisfactory results yet, even following different patterns. The adoption of healthy and sustainable behaviours, especially those related to food, remains a psychologically distant concept for most consumers. The challenge for Italy and Brazil, therefore, remains the same: to understand the best strategy to move their citizens' decisions towards a more sustainable diet, which improves their personal well-being and that of the world in which they live.

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Appendices

Appendix 1 – Italian questionnaire

PAGE 1

Ciao, Questo è un invito a rispondere a una ricerca accademica sulle abitudini di attività fisica, immagine del proprio corpo e alimentazione. Non esiste una risposta giusta o sbagliata, questo non è un test. Rispondi a tutte le domande nel modo più onesto e accurato possibile, è molto importante. Questo questionario dura circa 10-15 minuti. Vuoi partecipare e consentire che le tue risposte vengano utilizzate come analisi di studio?

A. Sì

B. No

PAGE 2

Siamo interessati al tuo livello di attività fisica negli ultimi 7 giorni (nell'ultima settimana). Ciò include tutte quelle attività che ti fanno sudare, stancarti o respirare a fatica, come sport di squadra, corsa, attività lavorative faticose, e altro ancora.

1. ***Attività fisica nel tempo libero: hai svolto una delle seguenti attività negli ultimi 7 giorni (ultima settimana)? Se è così, quante volte? (Seleziona una risposta per riga.)***

	No	1-2	3-4	5-6	7 volte o più
Arrampicata					
Canottaggio / canoa					
Tennis / squash					
Camminare per fare esercizio					
Lavori manuali in casa o giardino					
Jogging o corsa					
Ciclismo					
Aerobica (o altra lezione di esercizio)					
Nuoto					
Baseball o softball					
Danza					
Rugby o football americano					
Calcio					
Hockey (su ghiaccio o su pista)					
Pallavolo					
Pallacanestro					
Pattinaggio (su terra o ghiaccio)					

Arti marziali
Allenamento con i pesi
Altre attività

2. ***Negli ultimi 7 giorni, durante la mattina, con che frequenza sei stato molto attivo/attiva (ad esempio: pratica sportiva, lezioni di ginnastica, attività lavorativa faticosa)? (Seleziona solo una risposta)***

Mai
1 volta nell'ultima settimana
2 o 3 volte nell'ultima settimana
4 o 5 volte nell'ultima settimana
6 o 7 volte nell'ultima settimana

3. ***Negli ultimi 7 giorni, dopo pranzo e prima di cena, con che frequenza sei stato molto attivo/attiva (ad esempio: pratica sportiva, lezioni di ginnastica, attività lavorativa intensa)? (Seleziona solo una risposta)***

Mai
1 volta nell'ultima settimana
2 o 3 volte nell'ultima settimana
4 o 5 volte nell'ultima settimana
6 o 7 volte nell'ultima settimana

4. ***Negli ultimi 7 giorni, dopo cena, quante volte sei stato molto attivo/attiva (ad esempio: pratica sportiva, lezioni di ginnastica, attività lavorativa intensa)? (Seleziona solo una risposta)***

Mai
1 volta nell'ultima settimana
2 o 3 volte nell'ultima settimana
4 o 5 volte nell'ultima settimana
6 o 7 volte nell'ultima settimana

5. ***Nell'ultimo fine settimana, con che frequenza sei stato molto attivo/attiva (ad esempio, pratica sportiva, lezioni di ginnastica, attività lavorativa intensa)? (Seleziona solo una risposta)***

Mai
1 volta nell'ultimo fine settimana
2 o 3 volte nell'ultimo fine settimana
4 o 5 volte nell'ultimo fine settimana
6 o 7 volte nell'ultimo fine settimana

6. ***Quale delle seguenti affermazioni ti descrive meglio rispetto agli ultimi 7 giorni? Leggi tutte e cinque le dichiarazioni prima di decidere la risposta che ti descrive. (Seleziona solo una risposta)***

A. Durante tutto o la maggior parte del mio tempo libero ho fatto cose che richiedevano uno sforzo fisico minimo.

B. Raramente (1-2 volte nell'ultima settimana) ho svolto attività fisica nel tempo libero (ad esempio, praticare sport, correre, nuotare, andare in bicicletta, fare aerobica).

C. Occasionalmente (3–4 volte nell'ultima settimana) ho svolto attività fisica nel tempo libero.

D. Spesso (5–6 volte nell'ultima settimana) ho svolto attività fisica nel tempo libero.

E. Molto spesso (7 o più volte nell'ultima settimana) ho svolto attività fisica nel tempo libero.

7. ***Seleziona la frequenza con cui hai svolto attività fisica ogni giorno nell'ultima settimana (ad esempio, pratica sportiva, lezioni di ginnastica, attività lavorativa intensa). (Seleziona una risposta per riga.)***

Mai; Raramente; Occasionalmente; Spesso; Molto spesso

Lunedi
Martedì
Mercoledì
Giovedì
Venerdì
Sabato
Domenica

8. ***Ti sei ammalato la scorsa settimana o qualcosa ti ha impedito di fare le tue normali attività fisiche? (Seleziona una risposta)***

Sì, e cosa? _____
No

PAGE 3

Vorremmo sapere come ti sei sentito riguardo al tuo aspetto fisico nelle ULTIME QUATTRO SETTIMANE. Per favore, rispondi a tutte le domande.

Mai
| Raramente
| | Qualche volta
| | | Frequentemente
| | | | Spesso
| | | | | Sempre

1	Sei stato/stata così preoccupato/preoccupata per la tua forma fisica da pensare che dovresti metterti a dieta?	1	2	3	4	5	6
2	Hai avuto paura di diventare grasso/grassa o più grasso/più grassa?.....	1	2	3	4	5	6
3	Essere sazio/sazia (ad esempio, dopo aver mangiato un pasto abbondante) ti ha fatto sentire grasso/grassa? ...	1	2	3	4	5	6
4	Pensi che la tua forma fisica sia peggiore rispetto a quella di altri/altre uomini/donne?	1	2	3	4	5	6
5	Pensare alla tua forma fisica ha interferito con la tua capacità di concentrazione (ad esempio, mentre guardi la televisione, leggi, ascolti conversazioni)?	1	2	3	4	5	6
6	Essere nudo/nuda, come quando fai la doccia, ti ha fatto sentire grasso/grassa?	1	2	3	4	5	6
7	Hai mai immaginato di tagliare aree carnose del tuo corpo?	1	2	3	4	5	6
8	Non sei uscito/uscita per occasioni sociali (ad esempio, feste) perché non ti piaceva la tua forma fisica?	1	2	3	4	5	6
9	Ti sei sentito/sentita eccessivamente pesante o appesantito/appesantita?	1	2	3	4	5	6
10	Hai mai pensato di essere nella forma fisica in cui sei a causa della mancanza di autocontrollo?	1	2	3	4	5	6
11	Ti preoccupi che altre persone vedano rotoli di grasso intorno alla tua vita o allo stomaco?	1	2	3	4	5	6
12	Quando sei in compagnia, ti preoccupi di occupare troppo spazio (ad esempio, quando ti siedi sul divano o sul sedile dell'autobus)?	1	2	3	4	5	6
13	Vedere il tuo riflesso (ad esempio, in uno specchio o in una vetrina) ti ha fatto sentire male per la tua forma fisica?	1	2	3	4	5	6
14	Hai pizzicato aree del corpo per vedere quanto grasso c'è?	1	2	3	4	5	6
15	Hai evitato situazioni in cui le persone potevano vedere il tuo corpo (ad esempio, spogliatoi o piscine comuni)?	1	2	3	4	5	6
16	Sei particolarmente imbarazzato/imbarazzata dalla tua forma quando sei in compagnia di altre persone?	1	2	3	4	5	6

PAGE 4

Seleziona il risultato di 10+25

- 30
- 35
- 40
- 45

PAGE 5

1. Alcune persone credono che seguire una dieta sostenibile apporti benefici specifici. Quanto sei d'accordo con le seguenti affermazioni?

1. Una dieta sostenibile riduce l'assunzione di grassi saturi
2. Una dieta sostenibile previene le malattie in generale (ad esempio, malattie cardiache, cancro)
3. Una dieta sostenibile migliora il benessere e la contentezza (pace interiore)
4. Una dieta sostenibile contribuisce ad una minore spesa per la sanità
5. Una dieta sostenibile stimola un utilizzo efficiente di risorse economiche
6. Una dieta sostenibile riduce il riscaldamento globale
7. Una dieta sostenibile è migliore per l'ambiente
8. Una dieta sostenibile contribuisce al benessere degli animali

- Completamente in disaccordo
- In disaccordo
- Parzialmente in disaccordo
- Né d'accordo né in disaccordo
- Parzialmente d'accordo
- D'accordo
- Completamente d'accordo

PAGE 6

1. Quando pianifichi l'acquisto di cibo e gestisci il cibo conservato in casa, hai l'abitudine di intraprendere le seguenti azioni?

- Mai
- Raramente
- Eventualmente
- Qualche volta
- Frequentemente
- Spesso
- Sempre

2. Quando prepari i pasti, di solito intraprendi le seguenti azioni?

- No, non intraprendo queste azioni
- No, ma vorrei intraprendere queste azioni

- No, ma mi sto preparando a intraprendere queste azioni presto
- Non ancora, ma sto per intraprenderle
- Sì, ho intrapreso queste azioni da meno di sei mesi
- Sì, ho intrapreso queste azioni da più di sei mesi e meno di un anno
- Sì, lo faccio da un anno o più

3. Quando acquisti cibo per il tuo consumo e la tua famiglia, dai la priorità ai seguenti aspetti?

- No, non gli do la priorità
- No, ma vorrei dargli la priorità
- No, ma mi sto preparando a dargli la priorità presto
- Non ancora, ma sto per dargli la priorità
- Sì, gli do la priorità da meno di sei mesi
- Sì, gli do la priorità da più di sei mesi e meno di un anno
- Sì, gli do la priorità da un anno o più

4. Qualcuna delle seguenti caratteristiche ti impedisce di acquistare un determinato alimento?

- No
- No, ma sto iniziando a pensarci
- No, ma presto vorrei iniziare a considerarlo nei miei acquisti
- Non ancora, ma sto per iniziare a considerarlo nei miei acquisti
- Sì, utilizzo questo criterio negli acquisti da meno di sei mesi
- Sì, utilizzo questo criterio negli acquisti da più di sei mesi e meno di un anno
- Sì, utilizzo questo criterio negli acquisti da un anno o più

5. Per quanto riguarda le tue abitudini alimentari, svolgi le seguenti azioni?

- No
- No, ma mi piacerebbe
- No, ma mi sto preparando a svolgerle presto
- Non ancora, ma sto per iniziare a svolgerle
- Sì, lo faccio da meno di sei mesi
- Sì, lo faccio da più di sei mesi e meno di un anno
- Sì, lo faccio da un anno o più

6. In relazione al consumo abituale di alimenti di origine animale, hai apportato una delle seguenti modifiche?

- No
- No, ma mi piacerebbe
- No, ma mi sto preparando ad apportarle presto
- Non ancora, ma sto per iniziare ad apportarle
- Sì, lo faccio da meno di sei mesi
- Sì, lo faccio da più di sei mesi e meno di un anno
- Sì, lo faccio da un anno o più

Domanda	Dimensione della sostenibilità	Item
1. Quando pianifichi l'acquisto di cibo e gestisci il cibo conservato in casa, hai l'abitudine di intraprendere le seguenti azioni?	Economia	Fare la lista della spesa, per evitare di acquistare qualcosa di non necessario o in eccesso
	Economia	Evitare di conservare grandi quantità di cibo in dispensa in modo che non ci sia rischio di deterioramento
	Economia	Pianificare la quantità di cibo da preparare in base al numero di persone che mangiano
	Economia	Evitare di avere grandi quantità di cibo congelato, per non aumentare la spesa energetica del congelatore
2. Quando prepari i pasti, di solito esegui le seguenti azioni?	Economia	Evitare di fare preparazioni che richiedono molto tempo nel microonde
	Economia	Sfruttare appieno gli alimenti (gambi, bucce, foglie ecc.)
	Economia	Congelare gli alimenti che stanno per andare a male
	Economia	Congelare il cibo avanzato per un consumo successivo
	Economia	Usare il cibo avanzato già preparato in nuove preparazioni
3. Quando acquisti cibo per il tuo consumo e la tua famiglia, dai la priorità ai seguenti aspetti?	Ecologico/Etico/ Ambientale	Cibo prodotto secondo l'agroecologia (logica ecologicamente sostenibile, economicamente efficiente e socialmente giusta)
	Ecologico/Etico/ Ambientale	Cibo prodotto con energia pulita e tecnologie “verdi”
	Ecologico/Etico/ Ambientale	Alimenti "stagionali"
	Ecologico/Etico/ Ambientale	L'azienda che produce il cibo utilizza additivi sintetici o pesticidi
	Ecologico/Etico/ Ambientale	Cibo coltivato nelle regioni vicine (locale / regionale)
	Ecologico / Etico / Ambientale	Cibo prodotto al di fuori del paese / regione in cui vivi e quindi trasportato su lunghe distanze

4. Qualcuna delle seguenti caratteristiche ti impedisce di acquistare un determinato alimento?	Sociale / culturale / politico	L'azienda che produce il cibo non rispetta i diritti degli animali
	Sociale / culturale / politico	L'azienda che produce il cibo non rispetta i diritti umani / i diritti dei lavoratori / le condizioni di lavoro
5. Per quanto riguarda le tue abitudini alimentari, svolgi le seguenti azioni?	Salute	Cercare di seguire una dieta molto varia
	Salute	Ridurre le dimensioni delle porzioni di cibo
	Salute	Evitare gli alimenti ultra-processati (formulazioni industriali composte interamente o principalmente da sostanze estratte dal cibo, derivate da parti di altri alimenti, o sintetizzate in laboratorio)
	Salute	Dare la preferenza ad alimenti naturali e minimamente trattati
	Salute	Mantenere un modello alimentare che soddisfi aspetti personali, culturali e tradizionali, non solo i bisogni nutrizionali
6. In relazione al consumo abituale di alimenti di origine animale, hai apportato una delle seguenti modifiche?	Salute	Ridotto consumo di carne rossa (carne di tutte le specie di mammiferi)
	Salute	Ridotto apporto di alimenti di origine animale in genere (carni di tutti i tipi, uova e latticini)

Appendix 2 – Portuguese questionnaire

PAGE 1

Olá, Este é um convite para responder a uma pesquisa acadêmica sobre atividade física, imagem corporal e hábitos alimentares. Não existe resposta certa ou errada, desta forma você pode responder rapidamente às questões baseando-se na sua primeira impressão. Este questionário tem duração de 10/15 minutos. Você quer participar e permitir que suas respostas sejam utilizadas para análise do estudo?

a. Sim

b. Não

PAGE 2

Queremos saber sobre seu nível de atividade física nos últimos 7 dias (na última semana). Isso inclui atividades que fazem você suar, cansar ou respirar com dificuldade, como esportes de equipe, corrida, atividades ocupacionais extenuantes e outras.

1. Atividade física em seu tempo livre: Você fez alguma das seguintes atividades nos últimos 7 dias (semana passada)? Se sim, quantas vezes? (Marque apenas um círculo por linha.)

	Não	1-2	3-4	5-6	7 vezes ou mais
Escalada					
Remo / canoagem					
Tênis / squash					
Caminhando para fazer exercício					
Trabalho pesado na casa ou no jardim					
Corrida lenta ou corrida de velocidade					
Ciclismo					
Aeróbica (ou outra aula de exercícios)					
Natação					
Beisebol ou softbol					
Dança					
Rugby ou futebol Americano					
Futebol					
Hóquei (no gelo ou no chão)					
Vôlei					
Basquetebol					

Patinação (artística / gelo)
Artes marciais
Treinos na musculação
Outras atividades

2. Nos últimos 7 dias, durante a manhã, com que frequência você foi muito ativo/ativa (por exemplo: praticar esportes, aulas de ginástica, atividade ocupacional extenuante)? (Marque apenas um.)

Nenhuma vez
1 vez na semana passada
2 ou 3 vezes na semana passada
4 ou 5 vezes na semana passada
6 ou 7 vezes na semana passada

3. Nos últimos 7 dias, após o almoço e antes do jantar, com que frequência você foi muito ativo/ativa (por exemplo: praticar esportes, aulas de ginástica, atividade ocupacional extenuante)? (Marque apenas um.)

Nenhuma vez
1 vez na semana passada
2 ou 3 vezes na semana passada
4 ou 5 vezes na semana passada
6 ou 7 vezes na semana passada

4. Nos últimos 7 dias, durante a noite, com que frequência você foi muito ativo/ativa (por exemplo: praticar esportes, aulas de ginástica, atividade ocupacional extenuante)? (Marque apenas um.)

Nenhuma vez
1 vez na semana passada
2 ou 3 vezes na semana passada
4 ou 5 vezes na semana passada
6 ou 7 vezes na semana passada

5. No último fim de semana, com que frequência você foi muito ativo/ativa (por exemplo: praticar esportes, aulas de ginástica, atividade ocupacional extenuante)? (Marque apenas um.)

Nenhuma vez
1 vez no último fim de semana
2 ou 3 vezes no último fim de semana
4 ou 5 vezes no último fim de semana
6 ou 7 vezes no último fim de semana

6. Qual das seguintes opções descreve você melhor nos últimos 7 dias? Leia todas as cinco afirmações antes de decidir sobre a resposta que descreve você. (Marque apenas um.)

A. Todo ou a maior parte do meu tempo livre eu fiz coisas que envolviam pouco esforço físico.

B. Raramente (1–2 vezes na semana passada) fiz atividades físicas em meu tempo livre (por exemplo, praticava esportes, corria, nadava, andava de bicicleta, fazia aeróbica).

C. Ocasionalmente (3–4 vezes na semana passada) fiz atividades físicas em meu tempo livre.

D. Frequentemente (5–6 vezes na semana passada) fiz atividades físicas em meu tempo livre.

E. Muito frequentemente (7 ou mais vezes na semana passada) fiz atividades físicas no meu tempo livre.

7. Marque com que frequência você fez atividade física cada dia na última semana (por exemplo: praticar esportes, aulas de ginástica, atividade ocupacional extenuante). (Marque apenas um.)

Nunca; Raramente; Ocasionalmente; Frequentemente; Muito frequentemente

Segunda-feira
Terça-feira
Quarta-feira
Quinta-feira
Sexta-feira
Sábado
Domingo

8. Você ficou doente na semana passada, ou algo o impediu de fazer seu normal atividades físicas? (Marque um.)

Sim, e o que o impediu? _____
Não

PAGE 3

Gostaríamos de saber como você tem se sentido a respeito de sua aparência nas ÚLTIMAS QUATRO SEMANAS. Por favor responda a todas as questões.

		Nunca	Raramente	As vezes	Frequentemente	Muito frequentemente	Sempre
1	Tem estado tão preocupado(a) com a forma do seu corpo que começou a pensar que deveria fazer dieta?.....	1	2	3	4	5	6
2	Tem sentido medo de ficar gordo(a) ou mais gordo(a)?.....	1	2	3	4	5	6
3	Sentir-se cheio(a) (por exemplo, depois de ingerir uma refeição grande) fez com que se sentisse gordo(a)?...	1	2	3	4	5	6
4	Você notou a forma de outros homens/mulheres e sentiu que sua própria forma corporal se comparava desfavoravelmente?.....	1	2	3	4	5	6
5	Pensar na forma do seu corpo interferiu na sua capacidade de se concentrar noutras atividades (como por exemplo, ver televisão, ler ou acompanhar uma conversa)?	1	2	3	4	5	6
6	Estar nu(nua), por exemplo, durante o banho, fez com que se sentisse gordo(a)?.....	1	2	3	4	5	6
7	Já imaginou remover (cortar) partes carnudas do seu corpo?.....	1	2	3	4	5	6
8	Deixou de ir a eventos sociais (como por exemplo, festas) por sentir-se mal com a forma do seu corpo?.....	1	2	3	4	5	6
9	Sentiu-se excessivamente grande e arredondado(a)?	1	2	3	4	5	6
10	Acredita que a forma do seu corpo se deve à sua falta de autocontrole(o)?	1	2	3	4	5	6
11	Preocupou-se que outras pessoas vissem dobras na região da sua cintura ou estômago?.....	1	2	3	4	5	6
12	Quando acompanhado(a), preocupou-se em ocupar um espaço excessivo (por exemplo, sentado(a) num sofá ou no banco de um transporte público)?.....	1	2	3	4	5	6

13	Ver o seu reflexo (por exemplo, num espelho ou na vitrine de uma loja) fez com que se sentisse mal em relação ao seu corpo?.....	1	2	3	4	5	6
14	Beliscou áreas do seu corpo para ver a quantidade de gordura que existe?	1	2	3	4	5	6
15	Evitou situações nas quais as pessoas pudessem ver o seu corpo (por exemplo, vestiários)?.....	1	2	3	4	5	6
16	Sentiu-se particularmente desconfortável com a forma do seu corpo, quando na companhia de outras pessoas?	1	2	3	4	5	6

PAGE 4

Marque o resultado de 10+25

- 30
- 35
- 40
- 45

PAGE 5

Algumas pessoas acreditam que seguir uma dieta sustentável tem benefícios específicos. Quanto, se aplicável, essas declarações se aplicam a você? (Escolha uma resposta para cada afirmação.)

- Uma dieta sustentável diminui minha ingestão de gorduras saturadas
- Uma dieta sustentável previne doenças em geral (por exemplo, doenças cardíacas, câncer)
- Uma dieta sustentável melhora o bem-estar e o contentamento (paz interior)
- Uma dieta sustentável contribui para a diminuição da disfunção social (menores gastos com saúde e melhor qualidade de vida)
- Uma dieta sustentável aumenta a eficiência na utilização dos recursos econômicos
- Uma dieta sustentável reduz o aquecimento global
- Uma dieta sustentável é melhor para o meio ambiente
- Uma dieta sustentável contribui para o bem-estar e os direitos dos animais

1. Discordo completamente
2. Discordo
3. Discordo parcialmente
4. Não concordo nem discordo
5. Concordo parcialmente
6. Concordo
7. Concordo completamente

PAGE 6

1. Ao planejar as compras de alimentos e administrar os alimentos armazenados em sua casa, você tem o hábito de tomar como atitudes a seguir?

- Nunca
- Raramente
- Eventualmente
- Ocasionalmente
- Moderadamente
- Frequentemente
- Muito frequentemente

2. Quando está preparando refeições, você costuma tomar como atitudes a seguir?

- Não, não tomo essas atitudes
- Não, mas gostaria de tomar essas atitudes
- Não, mas estou me preparando para tomar essas atitudes em breve
- Ainda não, mas estou prestes a tomar essas atitudes
- Sim, tomo essas atitudes há menos de seis meses
- Sim, tomo essas atitudes há mais de seis meses e menos de um ano
- Sim, tomo essas atitudes há um ano ou mais

3. Ao comprar alimentos para seu consumo e sua família, você dá prioridade aos aspectos a seguir?

- Não, não dou prioridade
- Não, mas gostaria de dar prioridade
- Não, mas estou me preparando para dar prioridade em breve
- Ainda não, mas estou prestes a começar a dar prioridade
- Sim, dou prioridade há menos de seis meses
- Sim, dou prioridade há mais de seis meses e menos de um ano
- Sim, dou prioridade há um ano ou mais

4. Alguma (s) das características a seguir faz com que você não compre determinado alimento?

- Não, não faz
- Não, mas estou começando a pensar nisso
- Não, mas em breve gostaria de começar a considerar isso em minhas compras
- Ainda não, mas estou prestes a começar a considerar isso em minhas compras
- Sim, uso esse critério há menos de seis meses
- Sim, uso esse critério há mais de seis meses e menos de um ano
- Sim, uso esse critério há um ano ou mais

5. Quanto aos seus hábitos alimentares, você realiza as ações a seguir?

- Não, não realizo
- Não, mas gostaria de realizar

- Não, mas estou me preparando para realizar em breve
- Ainda não, mas estou prestes a começar a realizar
- Sim, realizo há menos de seis meses
- Sim, realizo há mais de seis meses e menos de um ano
- Sim, realizo há um ano ou mais

6. Em relação ao seu consumo habitual de alimentos de origem animal, você fez alguma das mudanças a seguir?

- Não, não realizo
- Não, mas gostaria de realizar
- Não, mas estou me preparando para realizar em breve
- Ainda não, mas estou prestes a começar a realizar
- Sim, realizo há menos de seis meses
- Sim, realizo há mais de seis meses e menos de um ano
- Sim, realizo há um ano ou mais

Questão	**Dimensão da Sustentabilidade**	**Item**
1. Ao planejar as compras de alimentos e administrar os alimentos armazenados em sua casa, você tem o hábito de tomar como atitudes a seguir?	Econômica	Fazer lista de compras, para evitar comprar algo desnecessário ou em excesso
	Econômica	Evitar armazenar alimentos em grandes quantidades no estoque seco (armários / despensa), para que não corram o risco de estragar
	Econômica	Planejar a quantidade a ser preparada de acordo com o número de pessoas que vão comer
	Econômica	Evitar ter grandes quantidades de alimentos congelados, para não aumentar o gasto de energia com o freezer
2. Quando está preparando refeições, você costuma tomar como atitudes a seguir?	Econômica	Evitar realizar preparos que precisem de muito tempo no micro-ondas
	Econômica	Aproveitar os alimentos integralmente (talos, cascas, folhas, soro do leite, etc)
	Econômica	Congelar alimentos que predeterminados de vencer ou estragar
	Econômica	Congelar sobras de alimentos preparados em grandes quantidades, para consumo posterior
	Econômica	Utilizar sobras de alimentos já preparados em novas preparações

3. Ao comprar alimentos para seu consumo e sua família, você dá prioridade aos aspectos a seguir?	Ecológico / Ético / Ambiental	Produzidos de acordo com a agroecologia (lógica ambientalmente sustentável, economicamente eficiente e socialmente justa)
	Ecológico / Ético / Ambiental	Produzidos com energia limpa e tecnologias verdes
	Ecológico / Ético / Ambiental	Alimentos "da época"
	Ecológico / Ético / Ambiental	A empresa que produz o alimento utiliza aditivos sintéticos ou agrotóxicos
	Ecológico / Ético / Ambiental	Cultivados em regiões próximas (locais / regionais)
4. Alguma (s) das características a seguir faz com que você não compre determinado alimento?	Ecológico / Ético / Ambiental	É um produzido fora do país / da região onde você mora e, portanto, transportado por longas distâncias para chegar até você
	Social / cultural / político	A empresa que produz o alimento não respeita os direitos dos animais
	Social / cultural / político	A empresa que produz o alimento não respeita os direitos humanos / direitos dos trabalhadores / condições de trabalho
5. Quanto aos seus hábitos alimentares, você realiza as ações a seguir?	Saúde	Procurar ter uma alimentação bastante variada
	Saúde	Reduzir o tamanho das porções de alimentos
	Saúde	Evitar alimentos ultraprocessados (formulações industriais feitas inteiramente ou em sua maior parte de substâncias extraídas de alimentos, derivadas de partes de alimentos ou sintetizadas em laboratório)
	Saúde	Dar preferência a alimentos in natura e minimamente processados ("comida de verdade")
	Saúde	Manter um padrão alimentar que atenda a aspectos pessoais, culturais e tradicionais, e não somente às necessidades de nutrientes
6. Em relação ao seu consumo habitual de alimentos de origem animal, você fez alguma das mudanças a seguir?	Saúde	Redução do consumo de carne vermelha (carne de todas as espécies de mamíferos)
	Saúde	Redução da ingestão de alimentos de origem animal em geral (carnes de todos os tipos, ovos e lácteos)