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Diet proposition based on the food pyramid for patients with chronic obstructive pulmonary disease

Proposta dietética baseada na pirâmide alimentar para indivíduos com doença pulmonar obstrutiva crônica

Propuesta dietética basada en la pirámide alimentaria para individuos con enfermedad pulmonar obstructiva crónica

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ABSTRACT
The aim was to develop a diet proposal, based on a review of the literature on food pyramids for individuals with Chronic Obstructive Pulmonary Disease (COPD), in order to be used in diet therapy applied to adult men and women with COPD. Food pyramids are important tools used for food and nutrition education purposes. Previously, Rondanelli et al. (2020) developed an adapted food pyramid, along with guidelines for energy and dietary intake, in order to prevent and treat nutritional complications associated with COPD, but it was not translated into dietary planning. Four different diets were herein elaborated, two of them comprised 50% lipids and 30% carbohydrates and the other two comprised 50% carbohydrates and 30% lipids. Data on the mean body weight of men and women in the age group 35-44 years, as well as recommendations for food pyramid macro and micronutrients, were taken into account to build the dietary plan. Four food composition tables were used to select the food types forming the meal plan. The herein proposed diets have anti-inflammatory and antioxidant properties; this factor required some considerations about their composition for the Brazilian context. It is essential promoting this diet therapy instrument to help professionals in the nutrition field to set a conduct more compatible to individual features of both patients and their lung disease.
Keywords: chronic obstructive pulmonary disease; nutritional sciences; nutritional needs; diet, food and nutrition.

RESUMO
O objetivo foi desenvolver uma proposta de dieta, baseada em uma revisão da literatura sobre pirâmide alimentar para indivíduos com Doença Pulmonar Obstrutiva Crônica (DPOC), para ser utilizada na dietoterapia aplicada a indivíduos adultos do sexo masculino e feminino DPOC. Pirâmides alimentares são importantes ferramentas de educação alimentar e nutricional. Previamente, Rondanelli et al. (2020) desenvolveram uma pirâmide alimentar adaptada, seguida de orientações de ingestão energética e dietética para prevenir e tratar complicações nutricionais associadas à DPOC, porém, não foi traduzida em forma de planejamento dietético. Aqui foram elaboradas quatro dietas, duas de 50% de lipídeos e 30% de carboidratos e duas de 50% de carboidratos e 30% de lipídeos. Para a construção do planejamento, levou-se em consideração dados de peso corporal médio de homens e mulheres da faixa etária de 35 a 44 anos, além das recomendações para macro e micronutrientes contidas na pirâmide alimentar. Foram utilizadas 4 tabelas de composição de alimentos para selecionar os alimentos que compõem os cardápios. As dietas aqui propostas possuem propriedades anti-inflamatórias e antioxidantes, sendo necessárias algumas considerações acerca de sua composição, para o contexto brasileiro. É fundamental promover este instrumento dietoterápico visando beneficiar profissionais da área de nutrição para uma conduta mais compatível com as características individuais do paciente e da doença pulmonar.
Palavras-chave: doença pulmonar obstrutiva crônica; ciências nutricionais; necessidades nutricionais; dieta, alimento e nutrição.

RESUMEN
El objetivo fue desarrollar una propuesta de dieta, basada en una revisión de la literatura sobre pirámides alimentarias para individuos con Enfermedad Pulmonar Obstructiva Crónica (EPOC), para ser utilizada en una terapia, en base a dietas. Las pirámides alimentarias son herramientas importantes de la educación alimentaria y nutricional. Anteriormente, Rondanelli et al. (2020) desarrollaron una pirámide alimentaria adaptada, seguida de pautas para la ingestión energética y dietética para prevenir y tratar las complicaciones nutricionales asociadas con la EPOC, pero no se tradujo en la forma de planificación dietética. Aquí se elaboraron cuatro dietas, dos del 50% de lípidos y el 30% de carbohidratos y dos de 50% de carbohidratos y 30% de lípidos. Para la construcción del planeamiento se tuvieron en cuenta datos sobre el peso corporal promedio de hombres y mujeres de 35 a 44 años de edad, además de las recomendaciones de macro y micronutrientes contenidas en la pirámide alimentaria. Se utilizaron cuatro tablas de composición de alimentos para seleccionar los alimentos que componen los menús. Las dietas propuestas aquí tienen propiedades antiinflamatorias y antioxidantes, y algunas consideraciones sobre su composición son necesarias para el contexto brasileño. Es fundamental promover este instrumento dietético-terapéutico con el fin de beneficiar a los profesionales del área de la nutrición para una conducta más compatible con las características individuales del paciente y la enfermedad pulmonar.
Palabras clave: enfermedad pulmonar obstructiva crónica; ciencias de la nutrición; necesidades nutricionales; dieta, alimentación y nutrición.

INTRODUCTION

Nutrition plays key role in preventing and treating Chronic Obstructive Pulmonary Diseases (COPD). This disease is featured by high energy expenditure due to airflow obstruction issues faced by patients affect by it; thus, lack of proper nutritional monitoring can lead to malnutrition in these individuals, whose quality of life is lower than that of well-nourished patients (ROSLER et al., 2021). An adapted food pyramid was previously developed, it was followed by guidelines for energy and dietary intake to prevent and treat nutritional complications associated with COPD (RONDANELLI et al., 2020). Food pyramids are important tools used for food and nutrition education purposes; they can reflect the dietary pattern of a given sociocultural context, such as the Mediterranean diet (BACH-FAIG et al., 2011), as well as provide guidelines aimed at specific target audiences, such as vegetarians (PEREIRA; SANTOS; LIMA, 2021), pregnant women (DEMÉTRIO, 2010), as well as individuals with COPD (RONDANELLI et al., 2020), osteopenia/osteoporosis (RONDANELLI et al., 2021) or rheumatoid arthritis (RONDANELLI et al., 2018). Translating food pyramids into dietary plans provides dieticians with the means to orient patients in a more illustrative and easy-to-understand way.

The food pyramid adapted to COPD (RONDANELLI et al., 2020) is divided into three parts: food types that should be consumed on a daily basis; food types that should be consumed 1, 2 or 4 times a week, and food types that should be consumed occasionally. Starting from the base of the pyramid, the following food types should be consumed on a daily basis: mineral water (from 1.5L to 2L); 5 servings of vegetables (200g), salad (80g) and fruits (150g); 3 to 4 servings of extra virgin olive oil (10ml), and 1 serving of seeds and dried fruits rich in omega-3 (30g); 1 serving of whole grains (80g of pasta/rice, 50g of bread and 30g of cereals for breakfast/snack); 2 servings of dairy products (150ml of low-fat milk and 125g of light yogurt), and 1 serving of red wine (125ml). Food types to be consumed 4 times a week comprise fish, rich in omega-3 (150g). Food types to be consumed twice a week comprise fresh cheeses (100g), eggs (60g), white meat (100g) and legumes (150g fresh and 50g dry). Food types to be consumed once a week comprise red (100g) and cured (50g) meat. At the top of

the pyramid, one finds food types to be consumed occasionally: dessert (100g). Supplementation with vitamin D, omega-3 fatty acids, antioxidants and salt can be seen (flagged) up higher in the pyramid. The food pyramid was developed by taking into consideration the need of performing individual nutritional assessment and energy intake of 30kcal/kg of weight/day.

With respect to macronutrient distribution, two possibilities were described for carbohydrates (CHO) and lipids (LIP) (RONDANELLI et al., 2020). According to the first scenario, which comprises 30% lipids and 50% carbohydrates, there is evidence of both increased carbon dioxide (VCO2) production and worsened clinical condition of patients with severe lung disease. Since carbohydrate intake lower than 200g/day was associated with improved well-being, a second scenario, comprising 50% lipids and 30% carbohydrates, was suggested. Such a scenario is the one wherein lipids were preferably polyunsaturated fatty acids (omega-3), with anti-inflammatory action, as well as the one that leads to likely improvement in ventilatory exchange and mitigation of the chronic respiratory failure condition. However, the food pyramid, as graphical representation, was not translated into dietary planning. It is consensus that COPD is a debilitating disease and that, at some point, its exacerbation and consequences will lead to certain functional disability. In addition, the current pandemic scenario caused by the Sars-CoV-2 virus makes individuals with COPD more vulnerable to the consequences of this infection. The vast majority of studies about the role played by nutrition in patients with COPD focus on addressing nutrients, in separate, either through their supplementation or intake, or on addressing the intake of different food groups. The literature only has few studies focused on investigating dietary plans aimed at this population.

In light of the foregoing, the aim of the current work was to use the food pyramid, adapted to patients with COPD, to plan a diet comprising 50% lipids or 50% carbohydrates, to be used in dietary therapy applied to adult male and female individuals.

METHODS

The development of the diet proposal was based on a review of the literature on food pyramids for individuals with Chronic Obstructive Pulmonary Disease (COPD), using as reference the work of Rondanelli et al., (2020).

Data about men and women's mean body weight were taken into consideration to build the herein adopted diets, in compliance with the Household Budget Survey – HBS (POF, 2008-2009) (INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA, 2010). Although there is a more updated HBS version available (2017-2018), it does not present data on population's weight and height, a fact that makes its use in the current work unfeasible.

Population studies about COPD are often conducted with individuals over 40 years old, given the chronic nature of it (SANTOS et al., 2021; KALUZA et al., 2019; ZANARDI; BENETTI, 2018). Therefore, the current work made the option for selecting individuals in the age group 35-44

years since, in addition to represent the age group mostly affected by COPD, they represented most of the population analyzed in the current research (INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA, 2010). Therefore, the herein adopted meal plan was developed by taking into consideration male weight of 74.6 kg and female weight of 63.8 kg. According to recommendations (RONDANELLI et al., 2020), 30kcal/kg of weight/day was offered to patients, and it resulted in planned menus of 2,238kcal and 1,914kcal for men and women, respectively.

Four different menus were prepared; two of them comprised 50% lipids and 30% carbohydrates (50% LM, male and 50% LW, woman) and the other two comprised 50% carbohydrates and 30% lipids (50% CM, male and 50% CW, woman). Four (4) food composition tables were used to inform the food types included in the diets and the amounts of macro and micronutrients in them, namely: Brazilian Food Composition Table - TBCA (UNIVERSIDADE DE SÃO PAULO; FOOD RESEARCH CENTER, 2020), Brazilian Food Composition Table - TACO (UNIVERSIDADE ESTADUAL DE CAMPINAS. Núcleo de Estudos e Pesquisas em Alimentação, 2011), Food Composition Table (PHILIPPI, 2018) and Nutritional Composition Table of Food Types Consumed in Brazil (INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA, 2011).

The aforementioned tables were consulted in order of priority, from the most recent to the oldest one, by assuming that the most current ones would be more diversified and updated. Thus, TBCA was the priority table, and it was followed by the others whenever a certain food type was not found in it. These tables focused on including food types available in the Brazilian territory, in addition to take into consideration other aspects, such as easy preparation (due to physical limitations faced by individuals with COPD), diversified food colors, among others.

Dietary plans were built based on the following procedures: consulting the food to be included in them; selecting the desired weight; and converting it, based on the simple rule of 3, in order to find the composition of macronutrients (carbohydrates, proteins and lipids), micronutrients (sodium, calcium, zinc, selenium, vitamins C and E) and fibers observed in that food, since the adopted tables expressed these values in 100g/ml of food.

RESULTS

Table 1 shows the description of the elaborated diets: 50%LM and 50%LW comprised 2,259.1kcal (CHO: 180g, 31.9% and LIP: 130g, 51.9%) and 1,895.5kcal (CHO: 153g, 32.4% and LIP: 107g, 51.1%), respectively; 50%CM and 50%CW comprised 2,233.9kcal (CHO: 290g, 51.9% and LIP: 79.2g, 31.9%) and 1,885.2kcal (CHO: 241g, 51.3% and LIP: 67g, 32.2%), respectively. Whole grains were prioritized as carbohydrates' source, whereas monounsaturated and polyunsaturated fatty acid-rich food types were the main lipid sources.

The amount of protein planned for both sexes was 1.2g/kg of weight/day, it comprised 90g (men) and 77g (women) of protein/day, which corresponds to 16% of total needed calories. Priority

was given to high biological value-protein sources in the pyramid, such as fish, which should be consumed 4 times a week.

Given the large number of fruits and vegetables in the planned menus, the amount of fiber (50% LM, 27.7 g; 50% LW 25.1 g; 50% CM, 34.4 g; 50% CW, 24.4 g) reached the Recommended Dietary Allowances (RDA) (PADOVANI et al., 2006). Avocado, which is rich in lipids and fibers, was included in the 50% LM and 50% LW menus, despite the high amount of lipids observed in them. The food pyramid focused on individuals with COPD recommends that milk and dairy products should be consumed twice a week. This group is represented on the menus by ricotta cheese (breakfast and mid-afternoon snack), low-fat natural yogurt (mid-afternoon snack and supper), liquid skimmed milk (breakfast and dinner) and liquid whole milk (dinner). The option made for different food types in this group aimed at managing the amount of lipids in the menus and at reaching the recommended amount of calcium. Legumes should also be consumed twice a week, similar to recommendations for milk and dairy product intake. This group was represented in the planned menus by roasted peanuts, which are a source of protein, fiber and polyunsaturated lipids.

The amounts of sodium (50% LM, 1.822 mg; 50% LW, 1.565 mg; 50% CM 1046 mg; 50% CW, 905.1 mg) calcium (50% LM, 1.811 mg; 50% LW, 1.625 mg; 50% CM, 1.749 mg; 50% CW, 1.600 mg), selenium, zinc (50% LM, 11.8 mg; 50% LW, 9.7 mg; 50% CM, 10.9 mg; 50% CW, 9.8 mg) and vitamin E (50% LM, 15.9 mg; 50% LW, 13.1 mg; 50% CM, 8.8 mg; 50% CW, 7 mg) calculated in all four diets have reached the Recommended Dietary Allowances (RDA) (PADOVANI et al., 2006) for these micronutrients. However, the final selenium amount (50%LM, 495.6µg; 50%LW, 410.6 µg; 50%CM, 436.7 µg and 50%CW, 435.2 µg) was higher than the Tolerable Upper Intake Level (UL 400 µg) (PADOVANI et al., 2006). Given the incidence of red wine in the pyramid, and by following its guidelines, the amount of alcohol to be consumed by the investigated population was the same on all menus (16.5mg); it featured moderate alcohol intake (RONDANELLI et al., 2020).

Table 1. Dietary planning based on the food pyramid adapted to patients with Chronic Obstructive Pulmonary Disease.

Meals	50% LM	50% CM	50% LW	50% CW
Breakfast:				
Coffee infusion	150ml – 1 ag	150ml – 1 ag	150ml – 1 ag	150ml – 1 ag
Liquid skimmed milk	100ml – ½ cup	100ml – ½ cup	100ml – ½ cup	100ml – ½ cup
Cinnamon powder	2g – 1 shallow ts	2g – 1 shallow ts	2g – 1 shallow ts	2g - 1 shallow ts
Ricotta cheese	50g – 1 L sl.	-	50g – 1 L sl.	-
Boiled egg	-	50g – 1 unit	-	50g – 1 unit
Cooked cassava	-	120g – 2 L pie.	-	50g – 1 M pie.
Chunky banana	-	75g 1 M unit	-	75g – 1 M unit
Oats in fine flakes	-	20g – 1 tsp	-	20g – 1 tsp
Papaya	120g – 1 M sl.	-	90g – 1 S sl.	-
Rolled oats	30g – 1 full tsp	-	20g – 1 tsp	-
Honey	12g – 1 tsp	7g – 1 ds	7g – 1 ds	7g – 1 ds

Mid-morning snack:				
Roasted cashew nuts	30g – 15 units	20g – 10 units	20g – 10 units	20g – 10 units
Brazil nuts	12g – 4 units	12g – 4 units	10g – 3 units	12g - 3 units
Mango	100g – 1 M sl.	-	80g – 1 S sl.	-
Melon	-	100g – 1 S sl.	-	100g – 1 S sl.
Lunch:				
Cooked brown rice	60g – 1 full rs	120g – 2 full rs	60g – 1 full rs	100g – 5 full tsp
Grated (raw) carrot	24g – 1 full tsp	-	12g – 1 shallow tsp	-
Saffron	2g – 1 shallow ts	-	2g – 1 shallow ts	-
Grilled sardine Canned sardine (oil)	- 75g – 1 Dp	75g – ½ L unit -	- 60g – ½ Netwp	60g – ½ M unit -
Sliced tomato	30g	-	30g	-
Boiled potato	30g	-	50g	-
Stewed pumpkin	50g – 1 rs	60g – 1 lev. ss	50g – 1 rs	50g – 1 rs
Braised green cabbage	30g – 1 full tsp	-	30g – 1 full tsp	-
Boiled beetroot	36g – 2 tsp	-	36g – 2 tsp	-
Chayote	-	30g – 1 full tsp	-	30g – 1 full tsp
Baked okra	-	40g – 2 tsp	-	30g – 1 full tsp
Arugula	-	7g – 4 leaves	-	7g – 4 leaves
Chard	-	15g – 1 M leaf	-	15g – 1 M leaf
Sesame	10g – 1 shallow tsp	-	10g – 1 shallow tsp	-
Extra virgin olive oil	10ml – 1 tsp	10ml – 1 tsp	10ml – 1 tsp	10ml – 1 tsp
Braised zucchini	-	70g – 1 full ss	-	75g – 4 full tsp
Red wine	150ml – 1 ag	150ml – 1 ag	150ml – 1 ag	150ml – 1 ag
Melon	100g – 1 S sl.	-	100g – 1 S sl.	-
Orange juice	-	100ml – ½ cup	-	100ml – ½ cup
Mango	-	45g	-	45g
Pineapple	-	45g	-	45g
Mid-afternoon snack:				
Ricotta cheese	50g – 1 L sl.	30g – 1 S sl.	50g – 1 S sl.	30g – 1 S sl.
Mashed avocado	75g – 4 full tsp	-	50g – 3 tsp	-
Chopped white onion	20g – 1 tsp	-	20g – 1 tsp	-
Chopped tomato	20g – 1 tsp	-	20g – 1 tsp	-
Roasted peanuts	40g – 2 tsp	20g – 1 tsp	30g – 1 full tsp	-
Wholemeal sliced bread	-	50g – 2 sl.	-	50g – 2 sl.
Curly lettuce	-	7g – 1 M leaf	-	7g – 1 M leaf
Grated carrot	-	24g – 1 full tsp	-	24g – 1 full tsp
Low-fat natural yogurt	-	170g – 1 bowl	-	150g – 1 bowl
Papaya	-	100g – 1 S sl.	-	70g – ½ M sl.
Strawberry	-	60g – 3 M units	-	60g – 3 M units
Rolled oats	-	20g – 1 tsp	-	20g – 1 tsp
Dinner:				
Coffee infusion	150ml – 1 ag	150ml – 1 ag	150ml – 1 ag	150ml – 1 ag

Liquid skimmed milk	100ml – ½ cup	-	100ml – ½ cup	-
Liquid whole milk	-	100ml – ½ cup	-	100ml – ½ cup
Cinnamon powder	-	2g – 1 shallow ts	-	2g – 1 shallow ts
Sugar	8g – 1 shallow tsp	-	8g – 1 shallow tsp	-
Canned sardine (oil)	75g – 1 Dp	-	60g – ½ Netwp	-
Steamed spinach	40g – 2 tsp	-	40g – 2 tsp	-
Tomato	40g – 6 rod	-	40g – 6 rod	-
Extra virgin olive oil	10ml – 1 tsp	-	10ml – 1 tsp	-
Boiled cooking banana	-	150g – 2 M pie.	-	150g – 2 M pie.
Minas Fresh cheese	-	70g – 2 M sl.	-	70g – 2 M sl.
Supper:				
Chopped avocado	-	90g – 3 full tsp	-	90g – 3 full tsp
Low-fat natural yogurt	170g – 1 bowl	-	150g – 1 bowl	-
Strawberry	60g – 3 M units	-	60g – 3 M units	-
Linseed (seed)	10g – 1 shallow tsp	-	10g – 1 shallow tsp	-
Grated dry coconut	9g – 1 shallow tsp	-	6g – 1 shallow ds	-

Fonte: Sampaio; Costa, 2022
Quantities were expressed in g/ml and cooking measurements. LM, lipids for men; LW, lipid for women; CM, carbohydrates for men; CW, carbohydrates for women. Cooking measurements: ag, "American glass"; Cup, cup; ts, teaspoon; sl., slice; L, large-size; M, medium-size; S, small-size; Unit, unit; pie., piece; tsp, tablespoon; full, full; ds, dessert spoon; rs, rice spoon; Dp, drained packaging; Netwp, net weight of the package; rod, round slices; ss, slotted spoon; lev.ss, leveled slotted spoon.

DISCUSSION

Based on the herein presented results, it is possible stating that the adopted menus were close to what was planned, and that they were in compliance with recommendations for individuals with COPD. The amount of calories in menus applied to adult men corroborated data available in the literature (ZANARDI; BENETTI, 2018), which recommends caloric intake ranging from 25 to 30 kcal/kg of weight/day, by taking into account the high energy expenditure experienced by patients with COPD. Protein intake remained within the range of 1.2g/kg of weight/day, which corresponded to 16% of energy needs. These data are in compliance with some studies (RONDANELLI et al., 2020; CHAMBANEAU et al., 2016) that established protein intake ranging from 1.2g/kg to 1.5g/kg of weight/day, or approximately 20% of energy needs, to help mitigating lean mass loss and preventing sarcopenia.

Lipid intake accounted for approximately 50% of the total caloric value established in two menus. It is recommended consuming high amounts of calories deriving from this nutrient, since it does not lead to significant increase in carbon dioxide (CO2) production, in comparison to carbohydrates (RONDANELLI et al., 2020). Increasing nutrient quantity implies increasing dietary quality, with emphasis on polyunsaturated and monounsaturated sources. A study (NORWITZ et al., 2021) has shown an even higher lipid intake (70%), and its beneficial impact on reducing inflammatory markers and on improving lung function. Carbohydrate intake remained within the range of 50% of total caloric

value, in two menus. Studies available in the literature have shown that consuming high amounts of this nutrient can increase CO2 production; however, some authors (ZANARDI; BENETTI, 2018) have suggested that higher caloric intake can be beneficial, mainly at early COPD stages.

As previously mentioned, fibers and all herein calculated micronutrients (in all menus) have reached the Recommended Dietary Allowances (RDA). Selenium, zinc, vitamin C and vitamin E are important antioxidant micronutrients, and their effects on improving lung function and inflammation markers are well-established in the literature (MARÍN-HINOJOSA et al., 2021). Selenium was the only mineral exceeding the Tolerable Upper Intake Level (UL 400 µg); among the signs and symptoms associated with selenium excess, one finds fatigue, which is capable of worsening COPD (COZZOLINO, 2020). Calcium intake helps preventing osteoporosis (RONDANELLI et al., 2021), whereas fiber intake plays essential role in the intestinal microbiota and, consequently, in mitigating inflammatory processes (MARÍN-HINOJOSA et al., 2021).

Although the diets described in Table 1 have met the proposed goal, it is necessary making some considerations. Legumes belong to a food group that is widely consumed in Brazilian diets; thus, lack of them in the elaborated diets could hinder patients' adherence to it, due to the cultural aspect. All menus comprised representatives of the milk and dairy group, which should be consumed twice a week, based on previously mentioned recommendations. Like legumes, milk and dairy products are widely consumed in Brazil; they comprise large amounts of calcium, whose importance in the herein investigated context was previously mentioned in the current work.

The intake of wine at lunch time aims at reaching the proposed alcohol intake recommendation. Based on the current results, alcohol intake on all menus can be featured as moderate. Although alcohol intake has deleterious effects on human health, moderate intake of it can be beneficial for patients with COPD (KALUZA et al., 2019). However, it is necessary taking into account individuals who do not drink alcohol (whether for religious reasons or due to addiction issues), and individuals have the alternative to drink whole grape juice. In addition, red wine is widely consumed and produced in Italy (the pyramid's place of origin); in other words, it is inserted in a context wherein it is consumed on a daily basis.

Based on the herein presented results, and on their discussion, it is pertinent mentioning some limitations of the current work. First, the mean weight used to calculate the menus may not represent the current population, since the herein adopted HBS was not the most up-to-date version and the current one did not provide data on population's weight and height. Second, because it is a hypothetical planning, conclusions in the current work refer to possibilities to guide future orientations and conducts. Finally, population studies based on controlled variables, such as population selection, intervention period, among others, should be conducted to assess the real effectiveness of the herein proposed diet, in practice.

CONCLUSION

The herein proposed diets, which were based on the food pyramid adapted to individuals with COPD, have anti-inflammatory and antioxidant properties. It is essential promoting this dietary therapy instrument in a context that takes into consideration patients' individual needs, lung disease features and follow-up by a multidisciplinary team. The herein proposed plans will help professionals in the nutrition field, since they enable adopting a conduct that is more compatible to the needs of individuals with COPD. In addition, they have evidenced that it is possible adapting the food pyramid, by taking into account the food types available in the context it is inserted in and by always respecting patients' biological individuality.

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