

# AVALIAÇÃO DA IMAGEM POSTURAL NA DOENÇA DE PARKINSON: UM ESTUDO DE DESENVOLVIMENTO

## EVALUATION OF POSTURE IMAGE IN PARKINSON'S DISEASE: A DEVELOPMENTAL STUDY

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**RESUMO | Introdução:** Indivíduos com Doença de Parkinson (DP) geralmente apresentam alterações posturais decorrentes do componente de balanço (perda de reflexos posturais) e do componente postural de orientação, como postura flexora, camptocormia, síndrome de Pisa e antecollis. **Objetivo:** Desenvolver um instrumento para avaliar a percepção da imagem postural (IP) de pessoas com DP. **Metódos:** Estudo de desenvolvimento, com natureza aplicada. **Resultados:** A escala desenvolvida denominou-se EAIP-DP (Escala de Avaliação da Imagem Postural- Doença de Parkinson). Foram consideradas 3 vistas: sagital, com doze desenhos da postura ereta até camptocormia; frontal, com doze desenhos da postura alinhada até a síndrome de Pisa; e sagital da cabeça, com seis desenhos da postura alinhada para retificação até antecollis. Os desenhos foram numerados de 1 a 6, onde 1 representou maior deformidade e 6, ausência de deformidade. A média dos valores das imagens variou de 1 a 6, considerando-se a percepção de deformidade como ausente, leve, média e grave. **Conclusão:** O instrumento desenvolvido nessa pesquisa, EAIP-DP, incluiu desenhos criados para representar progressivamente as alterações posturais específicas da DP, de modo a detectar o nível de percepção da IP relacionado às deformidades. Alteração da IP pode apresentar impacto sobre o equilíbrio, qualidade da marcha e do movimento corporal. Futuras pesquisas são necessárias para avaliar a validade e a confiabilidade da escala proposta.

**Unitermos:** imagem corporal, postura corporal, doença de Parkinson, avaliação, fisioterapia.

**ABSTRACT | Background:** Individuals with Parkinson disease (PD) usually have altered postural that are related with the balance component (loss of postural reflexes) and postural orientation component, such as camptocormia, stooped posture, Pisa syndrome and antecollis. **Objective:** To develop an instrument to evaluate the posture image (PI) perception in people with PD. **Methods:** A developmental study, with applied nature. **Results:** The developed Scale was called Evaluation of Posture Image Scale – Parkinson Disease (EPIS-PD). It was considered 3 views: sagittal, with twelve drawings from the erect posture to the camptocormia; frontal, with twelve drawings from the aligned posture to Pisa syndrome; and sagittal of the head, with six drawings from the aligned posture, to the rectification, until antecollis. The drawings were numbered from 1 to 6, where 1 represented the greater deformity and 6 represented absence of deformity, considering the perception of deformity as absence, mild, moderate and severe. **Conclusion:** The scale developed in this study, EPIS-PD, included the drawings created to represent progressively the specific postural alterations in PD to detect the level of the altered perception of PI related to these deformities. PI alteration can cause impact in the balance, gait quality and corporal movement quality. Future researches need to be done to evaluate the validation and reliability of the scale.

**Keywords:** body image, posture, Parkinson disease, evaluation, physiotherapy

## INTRODUCTION

Parkinson Disease (PD) was described by James Parkinson, in 1817, as a disease with specific signs and symptoms: involuntary tremors associated with muscle weakness, propensity to anterior inclination of the trunk even more accentuated and gait with short length steps and increased cadence<sup>1</sup>. It is characterized as a neurological and degenerative disease, with alteration on dopaminergic and non-dopaminergic pathways<sup>2</sup>, with cognitive, emotional and motor signs and symptoms<sup>3</sup>, highlighting rest tremor, bradykinesia, axial rigidity, postural alteration, postural instability and cognitive impairments<sup>3</sup>. The cognitive and perceptive abilities are decreased in patients with PD, considering that those who have akinesia probably have perception component involved<sup>4</sup>.

The postural alteration presented in PD could be due to two components: balance and postural orientation<sup>5</sup>. The balance component refers to the loss of postural reflexes, while that postural orientation component is represented by the postures<sup>5</sup>: Stooped posture, Camptocormia (thoracolumbar flexion of the spine approximately 45°)<sup>6</sup>, Pisa Syndrome (lateroflexion of the trunk of 10°-15° approximately, that disappears when the patient lies on supine)<sup>5-7</sup>, Antecollis (neck flexion with anterior head displacement)<sup>8</sup> and scoliosis<sup>9</sup>. Into the cited postural deformities, the typical posture of Parkinson is the stooped posture: knees and trunk flexion, with elbows flexed and adducted arms<sup>5,9</sup>.

The postural instability is presented in the later stages of the disease, due to alteration in postural control<sup>10,11</sup>. These postural impairments present in PD can be caused by the proprioceptive deficits of sensorial integration<sup>10</sup>. These proprioceptive deficits can be manifested associated with the alteration of body image, that comprehends the manner the person defines herself/himself according to her/his own body characteristics<sup>12</sup>. Furthermore, the internal body representation of the posture, described in this study as postural image, once inadequate, can result in alteration of vertical alignment, altering the projection of gravity centre in support base, with more vulnerability to falls<sup>9</sup>.

The evaluation of body image in individuals with PD was done by few studies in the literature<sup>12,13</sup>, that used questionnaires and scales not specific and not validated for this population, such as TAPS (Trunk Appearance Perception Scale), EFA (Self Concept Factorial Scale), The My Body Image Test and Stunkard Figure Scale. These instruments do not approach the typical postural deformities found in this population group. Besides that, the authors chose different resources of evaluation, what makes difficulty the standardization of the instruments.

It has been reported in the literature that individuals with PD present alteration of the perception of postural image, mainly related with frontal plane<sup>8,14</sup>. Therefore, despite of the literature had reported this alteration of the body perception in elderly with PD, we did not find proposal of an instrument of measurement for specific evaluation of postural image, probably because of the subjective character that involves the individual perception of the postural organization. Thus, the objective of this study is to develop a quantitative scale of the evaluation of the postural image perception, specific for patients with PD, which includes the postural deformities found in this condition.

## METHODS

It is a developmental study with applied nature. The applied study is characterized to be a production of science knowledges related with the clinical practice<sup>15</sup>, while the developmental study aim to construct, improve or validate a measure instrument, without testing hypothesis or controlling interferers variables<sup>16</sup>. This proposal research do not intend to validate nor to evaluate the reliability of the Scale, which will be done in future researches.

We researched in the science literature, through the data bases BVS, PEDRO, PUBMED, Cochrane Library, Academic Google, to find articles that could serve as a theory base to describe the kinds of altered postural and body image disorder in elderly with PD. This phase contributed to develop and adapt an evaluation instrument of postural image perception in elderly with PD.

The keywords used were “body image”, “body perception”, “evaluation”, “physiotherapy”, “Parkinson disease”, “posture”. These keywords were associated among themselves with different combinations, using the “AND”.

We considered works that discussed the thematic and that were published from 2000, because of the specificity and the shortage of articles, specifically those that approach the postural characteristics and the body image perception in PD, as well those that contemplate the evaluation of these variables. It was excluded those articles that discussed about surgery, medicines or about treatments that did not include evaluation aspects of the postural or body image, and also those articles that were published before 2000.

Two physiotherapists, which one of them is specialist in gerontology and posture, did the creation of the Scale and a drawer made and delivered to us the drawings. It was elaborated 3 views of the posture: a right sagittal view only of the head, a right sagittal total view of the whole body and an anterior frontal view. The drawings made in each view considered the sequence of the evolution of the postural alteration, since the smaller differences in the first drawings to bigger differences in the lasts. To the sagittal view of the whole body, it was created twelve drawings varying from the more aligned posture to the deformity of the camptocormia, with the gradual increasing of the flexion of the elbows, wrists and hands, hips and knees, being those drawings divided into six drawings for men and six drawings for women.

To the anterior frontal view, it was created twelve drawings, varying from the aligned posture in the median line to the deformity of Pisa syndrome and scoliosis, being those drawings divided into six drawings for men and six drawings for women. In the right sagittal view only considering the postural misalignment of the head, it was created six drawings that were common for men and women, and that vary from the aligned posture, a head rectification to the deformity of antecollis.

After the elaboration of the drawings, the interpretation of the results and the calculation form of the Scale created had as base the drawings from

the Trunk Appearance Perception Scale (TAPS) that was proposed by Bago et al<sup>17</sup> and that was used in Parkinson patients in another study done by Bissolotti et al<sup>13</sup>.

## RESULTS

In the literature review, during the first stage of the paper, we found 1808 articles in the database. Within these articles, we selected 43 articles by title. After the analysis of them, we selected 9 articles based on the inclusion and exclusion criteria, and they were used as a theory base for the elaboration of the Scale.

We called the created scale as Evaluation of Postural Image Scale – Parkinson Disease (EPIS-PD) (APPENDIX). Each view of the posture, which are sagittal only of the head, sagittal total and anterior frontal planes, were represented distinctly in the Scale as parts 1, 2 and 3, respectively. Within the parts 2 and 3, there were arranged the drawings of the male and female genders that corresponded to the same view.

To optimize the choice of their own postural image, we created, in each part, three questions to guide the patients in each view. To the sagittal view considering only the head, the question was “What is your postural image that represents your own head position?”. To the sagittal view considering the whole body, the question was “What is your postural image that represents your own body seen from the side?”. To the frontal view, the question was “What is your postural image that represents your own body seen from the front?”

As a purpose of avoiding that the patient choose the images based in the numbers, for each drawing we created a graduation from A to F, so the letter A represented the number 6 and F represented the number 1, being that the others letters followed the decreasing numeral sequence. The images that had male and female genders and belonged to the same view were placed together at the same part, so the letters A to F corresponded to the same image of each gender.

Each gender totalized 18 drawings. In each view, the drawings were numbered from 1 to 6, where 1 represented a level of great deformity of the posture and 6 represented a level of absence of deformity. Then, the patient should choose 3 images, one from each view, that he/she considers that represented his/her own postural image and his/her own level of postural deformity or the absence of it. The result of the images chosen was an arithmetic mean within the interval of [1,6].

The patient's perception of deformity was classified as absence, mild, moderate and severe, considering the result of the arithmetic mean. The perception of severe deformity of the posture varied from a closed interval between 1 and 2 - [1,2], the perception of medium deformity varied from an open interval between 2 and 5 - ]2,5[. The perception of soft deformity varied from a closed interval in 5 and an open interval in 6 - [5,6[ and the number 6 represented the perception of absence of postural deformity.

## DISCUSSION

The EPIS-PD (Evaluation of Postural Image Scale – Parkinson Disease) was created with the very purpose of evaluating the postural image of this population, being characterized as a scale developed that considers the postural deformities found in the literature about individuals in this neurologic condition. This proposal is based in the literature<sup>13</sup> that suggests that the altered body images found are related with the spinal deformities existent in Parkinson patients. Thus, the evaluation of the body image through images that represent the postural deformities can be an adequate instrument to detect the altered postural image. In addition, it can serve as a complementary guide to physical therapy treatment, once the better the posture gets, through treatments directed for this gain, the better the cognitive aspects related to the postural consciousness in this patients<sup>13</sup>.

According to Almeida et al<sup>18</sup>, there are many instruments in the scientific world used to evaluate body image, being divided in two major categories:

subjective evaluation and perceptual evaluation. The subjective evaluation means the investigation of feelings and attitudes that the person has about his/her own body, while that the perceptual evaluation is related with the accuracy of the perception that the person has about his/her own shape or size of the body<sup>18</sup>. Therefore, the EPIS-PD is a perceptual evaluation scale, due to the using of drawings that are related with the shape of the posture of the body.

Considering this perspective, the body image is known as the cognitive representation responsible to integrate the knowledge and the experiences of the person, which can be used as a base to the perception judgment<sup>19</sup>. Thus, the term postural image, used in this study, can be defined as the perception of the postural organization of the person, being part of the body image.

During the research for the creation of the scale, we noted that many articles used equivocated the term “body scheme” as synonymous or definition of “body image”. The difference between these two expressions is that body image means the way the person sees himself/herself and regulates his/her own behaviour, while that body scheme means the cortical representation of the body, being based in proprioceptive inputs used to rule the body movements<sup>19,20</sup>. The wrong use of these terms make the selection difficult of the studies that deal with the way of evaluating body image, and there are few studies<sup>12,13</sup> that made this kind of evaluation, specifically in individuals with PD.

The evaluation of body image is subjective, because the person judges himself/herself and the way that he/she sees himself/herself. Thus, the scales proposed for this evaluation are generally composed with drawings for the person to choose what it is closer to his/her own image, or then questions with phrases that the person can choose as closer to his/her clinical condition. Studies that used perceptual evaluation scales related with the posture of PD patients are directed to scoliosis, as the TAPS<sup>13</sup>. Therefore, the TAPS was created to evaluate teenagers with scoliosis and not as a way of evaluating the postural image of PD patients, which characterize a limitation, once it does not contemplate all postural deformities found in PD, what makes difficult to evaluate the alteration of postural image broadly.

Despite the scoliosis is a postural deformity very common in individuals with PD<sup>6</sup>, it is characterized as a structured alteration of the spine and do not disappear when the person lies down, which is different from the Pisa Syndrome. The Pisa Syndrome also can have or not a structured of the spine<sup>6</sup>. Individuals with PD that present Pisa Syndrome generally feel unbalanced when conducted by some external force to the medium line<sup>6</sup>, which strengthens the idea that those individuals probably perceived their posture in an altered way.

Patients that have both Camptocormia and Pisa Syndrome, could return to aligned posture when in supine, seated or vertically extended<sup>5,6,7</sup>. Only few patients have fixed deformity of camptocormia while others have the same deformity completely reversible<sup>6</sup>. There are no precise description that antecollis is a structured deformity<sup>8</sup>. Thus, due to the postural variabilities that these individuals can present, it justifies the creation of a scale more precise to evaluate the perception of postural image.

The patients with PD do not only present problems on motor aspects, but equally changes in the perception<sup>14</sup>, due to the alteration of the function on basal ganglia. Vaugoyeau et al.<sup>10</sup> agreed with this report when they affirmed that patients with PD present decrease in the processing of the perception of the movement and the proprioceptive feedback of the static position. Thus, the postural impairments found can be caused, in part, by the deficits of sensorial integration present in PD<sup>10</sup>.

The literature reports that still is difficult to make comparisons with others studies previously published, about the findings of body image in patients with PD, due to the lack of a standardization of the instruments<sup>13</sup>. The advantage of this research is that the scale created (EPIS-PD) can fill the literature gap about this topic, therefore, as a limitation, there is still the need of validation and evaluation of the reliability, with the aim to serve as a standard instrument to evaluate postural image of individuals with Parkinson disease.

## CONCLUSION

The developed instrument in this research, EPIS-PD, included drawings created to represent progressively the specific postural alterations, with the purpose to detect the level of perception of the postural image related to the deformities. The development of an instrument to evaluate the postural image in elders with PD should include the specifics postural impairments, once it is described in the literature the existence of disorders in the perception of the postural image. The EPIS-PD can help in the diagnosis of possible altered postural image in these individuals and serve as a support to the physiotherapy treatment, once these alterations can lead to possible impacts in balance, gait quality and corporal movement. Future researches are need to evaluate the validation and the reliability of this proposed scale.

## AUTHORS CONTRIBUTIONS

Deitos MV participated in the conception, design, literature review, data statistic analysis of and interpretation, and in the writing of the scientific article. Trippo KV participated in the conception, design, data interpretation, and critical evaluation of the final draft of the paper.

## CONFLICTS OF INTEREST

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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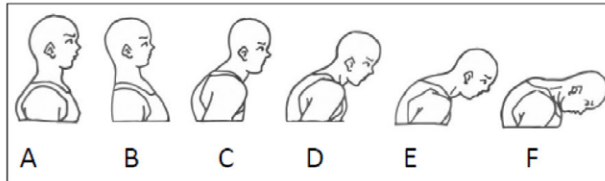
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# APPENDIX - EVALUATION OF POSTURAL IMAGE SCALE - PARKINSON DISEASE (EPIS - PD)

## EVALUATION OF POSTURAL IMAGE SCALE – PARKINSON DISEASE (EPIS - PD)

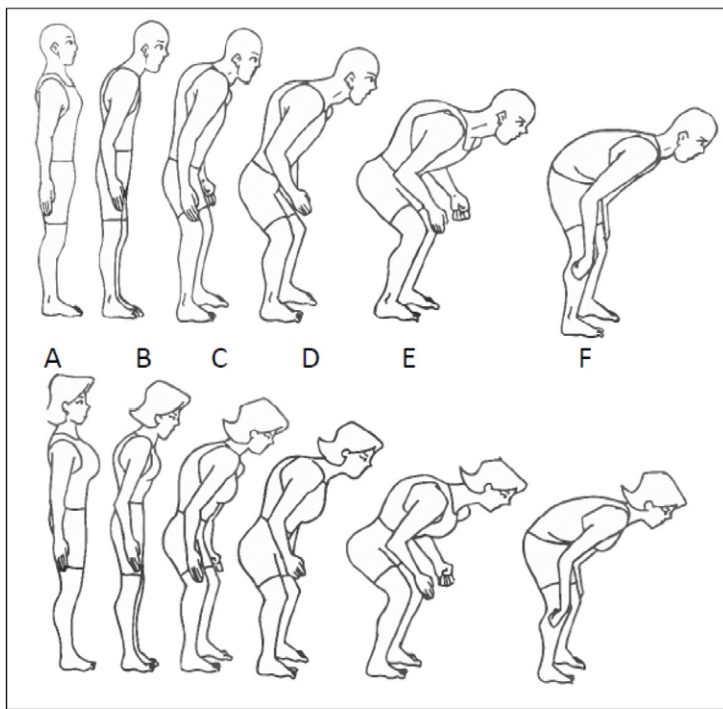
How do you perceive your postural image about your head position (PART 1), your own body seen from the side (PART 2) and your own body seen from the front (PART 3)? Choose one drawing in each part.

PART 1 - What is your postural image that represents your own head position?



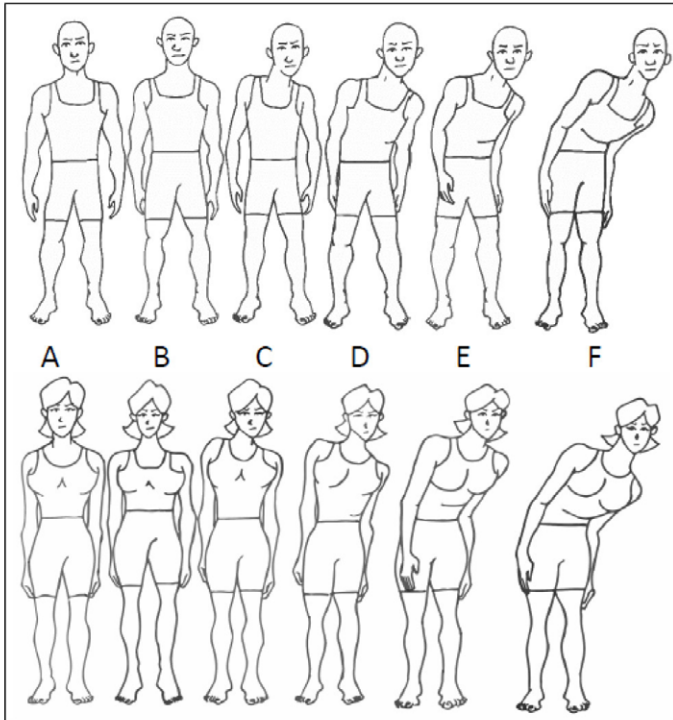
**Result:**

PART 2 - What is your postural image that represents your own body seen from the side?



**Result:**

PART 3 - What is your postural image that represents your own body seen from the front?



**Result:**

**Final Result:**

**Interpretation:**  
 Perception of severe deformity: [1,2]  
 Perception of medium deformity : ]2,5[  
 Perception of soft deformity: [5,6[  
 Perception of absence of deformity: 6

LABEL EPIS-PD	
A	6
B	5
C	4
D	3
E	2
F	1