

# Satisfaction and perception of chronic pain patients about an online and face-to-face pain neuroscience education program: cross-sectional study

*Satisfação e percepção de indivíduos com dor crônica sobre um programa de educação em neurociência da dor online e presencial: estudo observacional transversal*

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## ABSTRACT

**BACKGROUND AND OBJECTIVES:** The complexity of chronic musculoskeletal pain requires the need to know the treatment strategies from the perspective of the service user. The objective of this study was to analyze the satisfaction and perception of individuals with chronic musculoskeletal pain participating in a pain neuroscience education program in the online and face-to-face modalities.

**METHODS:** This is a cross-sectional observational study, composed of 26 participants, of which 13 individuals participated in 10 meetings of face-to-face pain education (FG), and the other 13 in the online modality (OG). The satisfaction assessment consisted of 10 questions from the MedRisk Instrument for Measuring Patient Satisfaction With Physical Therapy Care, and the perception assessment was obtained by means of seven questions developed by the researchers, specific about the pain education program. For statistical analysis, Mann-Whitney and chi square tests, Biostat software and significance level (0.05) were used.

**RESULTS:** Of the 17 questions, there was a difference between the groups in only 5 questions. The FG reported greater satisfaction and perception in the questions of “explanation about the treatment received” ( $\text{Chi}^2=6.19$ ;  $p=0.05$ ), “ways to avoid future problems” ( $\text{Chi}^2=4.727$ ;  $p=0.03$ ), “return to future services” ( $\text{Chi}^2=4.727$ ;  $p=0.03$ ), “relationship with other people” (10 vs 8;  $p=0.03$ ) and “increased level of physical activity” (9 vs 8;  $p=0.03$ ).

**CONCLUSION:** There was good satisfaction and perception of individuals with chronic musculoskeletal pain participating in a pain neuroscience education program both in the online and face-to-face modality. Some differences were observed between both, especially in issues that seem to involve face-to-face contact with a professional, with more positive results in the FG.

**Keywords:** Chronic pain, Health education, Patient satisfaction, Telemedicine.

## RESUMO

**JUSTIFICATIVA E OBJETIVOS:** A complexidade da dor musculoesquelética crônica exige a necessidade de conhecer as estratégias de tratamento sob a perspectiva do usuário do serviço. O objetivo deste estudo foi analisar a satisfação e a percepção de indivíduos com dor musculoesquelética crônica sobre um programa de educação em neurociência dor nas modalidades online e presencial.

**MÉTODOS:** Trata-se de um estudo observacional do tipo transversal, composto por 26 participantes, dos quais 13 indivíduos participaram de 10 encontros de educação em dor presencial (GP), e os outros 13 na modalidade online (GO). A avaliação da satisfação consistiu em 10 questões do *MedRisk Instrument for Measuring Patient Satisfaction With Physical Therapy Care*, e a avaliação da percepção foi obtida por meio de sete perguntas desenvolvidas pelos pesquisadores, específicas sobre o programa de educação em dor. Para análise estatística, foram utilizados os testes de Mann-Whitney e Qui Quadrado, *software* Biostat e nível de significância  $\leq 0,05$ .

**RESULTADOS:** Das 17 questões, houve diferença entre os grupos apenas em 5 questões. O GP relatou maior satisfação e percepção nas questões que se referem a “explicação sobre o tratamento recebido” ( $\text{Qui}^2=6,19$ ;  $p=0,05$ ), “formas de evitar futuros problemas” ( $\text{Qui}^2=4,727$ ;  $p=0,03$ ), “retorno para futuros serviços” ( $\text{Qui}^2=4,727$ ;  $p=0,03$ ), “relacionamento com outras

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## HIGHLIGHTS

- Pain neuroscience education is a non-pharmacological intervention that should be offered to the individual with chronic musculoskeletal pain.
- There is a gap in the literature about the quality of health care services provided over the phone compared to face-to-face consultations.
- The study's participants showed good satisfaction and perception of a pain neuroscience education program in both online and face-to-face modalities.

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peessoas” (10 *vs* 8;  $p=0,03$ ) e “aumento do nível de atividade física” (9 *vs* 8;  $p=0,03$ ).

**CONCLUSÃO:** Indivíduos com dor musculoesquelética crônica mostraram boa satisfação e percepção de um programa de educação em neurociência da dor tanto na modalidade online quanto na presencial. Algumas diferenças foram observadas entre ambas, sobretudo nas questões que parecem envolver contato face-a-face com um profissional, com resultados mais positivos quando o programa é oferecido de forma presencial.

**Descritores:** Dor crônica, Educação em saúde, Satisfação do paciente, Telessaúde.

## INTRODUCTION

Pain is a condition considered an urgent public health problem that constantly requires updates for prevention and treatment strategies<sup>1</sup>. According to the International Association for the Study of Pain (IASP)<sup>2</sup>, pain is defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”<sup>2,3</sup>. In this context, one of the great concerns is the presence of chronic pain (CP), which persists for a longer time than what is considered expected for the healing time<sup>4</sup>, that is, it lasts for a period longer than three months<sup>1,4,5</sup>. CP is also a cause of great disability and high levels of impairment, with significant impact on the individual quality of life<sup>6</sup>.

Generally, CP is associated with somatic, cognitive, emotional, behavioral, motivational and social factors<sup>7</sup>. In addition, difficulties in the perception and comprehension of pain, or even inadequate beliefs and behaviors, contribute to the persistence of pain, and serve as a barrier to treatment<sup>8</sup>. Pain neuroscience education has been shown to be an effective complementary treatment practice, as it uses cognitively based educational strategies in addition to specific physical therapy intervention<sup>8-11</sup>. Pain neuroscience education aims to increase knowledge and understanding of pain and all its related processes, and thus provide changes in behavior and pain self-management<sup>8,12</sup>. Furthermore, when concomitant with other therapeutic approaches, it has the potential to reduce the intensity of pain and improve psychosocial aspects when compromised, since the chronification process involves a biopsychosocial and not only physical context<sup>12</sup>.

There are different modalities of approach to pain education for people with CP, individual or in groups<sup>11</sup>, face-to-face or online contact, the latter can still be synchronous or asynchronous<sup>13</sup>. The online approach is recent, but it is possible and necessary to happen, since it is a valid alternative to circumvent limiting situations to face-to-face access<sup>14,15</sup>, either because of coronavirus pandemic<sup>16</sup>, low cost, reduction of travel time to the service, reduction of the number of professionals to provide the same intervention, or by geographical access barriers<sup>17,18</sup>. Also, in 2017, the World Confederation for Physical Therapy (WCPT) launched a task force to develop global initiatives for practices and regulations of virtual physical therapy<sup>19</sup>. Online physical therapy has proven to be a safe and effective option in the management of several health conditions, such as low back pain<sup>20</sup>, postoperative hip surgery<sup>21</sup>, chronic obstructive pulmonary disease (COPD)<sup>22</sup>, asthma, heart failure, diabetes, and cancer<sup>23</sup>.

However, there is a gap in the literature about the quality of telecare services compared to face-to-face consultations<sup>24</sup>, especially in Brazil, considering that the online modality was authorized by the Federal Council of Physiotherapy and Occupational Therapy (*Conselho Federal de Fisioterapia e Terapia Ocupacional* – COFFITO) in 2020, in order to avoid the lack of physiotherapeutic assistance and worsening of several health conditions<sup>13</sup>. Therefore, as important as recognizing the result of pain education programs, is to consider the satisfaction and perception of individuals with CP about the pain education programs in the proposed modalities, in person or online. Thus, to identify how the target group receives the pain neuroscience education is crucial to direct the different possibilities of delivery of this knowledge. The present study's objective was to analyze the satisfaction and perception of individuals with chronic musculoskeletal pain, participants of pain neuroscience education groups, promoted in person or online.

## METHODS

A cross-sectional observational study. This study follows the recommendations of Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)<sup>25</sup> for cross-sectional studies.

Individuals who had complaints of chronic musculoskeletal pain (duration of pain equal to or greater than three months), from the Physical Therapy School Clinic (*Clínica Escola de Fisioterapia* - CEFISIO) of the Midwest State University (*Universidade Estadual do Centro-Oeste* - UNICENTRO), the Open University of the Third Age (*Universidade Aberta da Terceira Idade* - UNATI), social networks, and local media (radios and newspapers) were invited to participate in the Pain Neuroscience Education Program (*Programa de Educação em Neurociência da Dor* - PEND), in the period between April 2019 and December 2020. The sample was recruited by convenience.

Recruitment for participation in PEND, in the face-to-face modality, occurred in the period between April and July 2019 for individuals in physical therapy care in CEFISIO. For the online participation, recruitment occurred from May to December 2020, in CEFISIO/UNICENTRO, UNATI, social networks and local media (radios and newspapers).

For the face-to-face modality, individuals aged 60 years or older, who complained of chronic musculoskeletal pain, and who agreed to participate in the study, carrying with them the signed Free and Informed Consent Term (FICT), were included in the study. For the online modality, the inclusion criteria were the same, but extended to the inclusion of any age group over 18 years old, and who had access to information and communications technology (ICT - internet, WhatsApp and Google Meet applications).

Individuals who presented a clinical diagnosis of dementia, obtained by a score of less than 13 on the Mini-Mental State Examination (MMSE), were excluded from the study. From the online modality those who, by self-report, presented some acute musculoskeletal condition, postoperative condition less than 6 months, and who did not verbalize were excluded.

Face-to-face group (FG) meetings of the PEND occurred in the group care rooms of CEFISIO/UNICENTRO, in the period between April 2019 and July 2019. The online group (OG) meetings took place through synchronous telecare on the Google-Meet platform, in the period between May and December 2020. The PEND meetings, both online and face-to-face, were based on the model proposed by the Pain Research Group, available at <http://pesquisaemdor.com.br/>, which presents the “Path to recovery” in nine meetings: (1) acceptance, (2 and 3) pain education, (4) sleep hygiene, (5) recognizing stress and negative emotions, (6) increasing positive coping in lifestyle, (7) exercises, (8) communication, (9) prevention of relapse<sup>26</sup>.

The PEND, both online and face-to-face, held 10 meetings, added by an initial intervention for group conversation, knowledge of each participant's health problems/conditions, expectations about the program, and previous experiences. The meetings were held weekly, with a maximum of 10 participants in each group. The multimedia material used in each meeting is available at [http://pesquisaemdor.com.br/?page\\_id=59](http://pesquisaemdor.com.br/?page_id=59) and the complementary material at home at [http://pesquisaemdor.com.br/?page\\_id=64](http://pesquisaemdor.com.br/?page_id=64), which consists of a summary of the meeting and an activity for the participants to develop during the week, in order to understand which modifications can be made in their daily life and that can have repercussions on pain self-management<sup>26</sup>. The PEND meetings were conducted by an academic previously trained on the topics presented. The meetings consisted of dialogic lectures, i.e., there was a PowerPoint presentation projected on the wall (face-to-face groups) or shared on the computer screen, which remained accessible for viewing by the participant on his computer or cell phone during the meeting (online groups). After the presentation, the participants were encouraged to participate by voicing their doubts and/or sharing their experiences. The academic conducted the meetings using clear, objective and assertive communication, aiming to promote reflection and behavior change in the participants' daily lives.

Each meeting had an average duration of 45 minutes to 1 hour. Of this time, approximately 30 minutes were used by the researcher to present the theme and orientations or practices of activities to be performed during the week, and the rest of the time for the dialogical session among the group members.

#### **Face-to-face Pain Neuroscience Education Program (FG)**

The PEND in the face-to-face modality was carried out at CEFISIO/UNICENTRO, on a pre-established date and time, and the complementary material was printed and made available to the participants to perform the proposed activities at home.

#### **Online Pain Neuroscience Education Program (OG)**

The PEND in the online modality was held synchronously on the GoogleMeet platform, on a date and time pre-established with the group of participants. The link of the meeting was made available on the WhatsApp application a few minutes before the time of the meeting.

Prior to start of the first meeting, participants received a video tutorial on installing and accessing GoogleMeet application. If

needed, a research participant provided assistance in this process via text message or phone call. The participant was also instructed to purchase a notebook to take notes of the meetings and especially the home activities that were sent after each synchronous meeting.

After the end of the meeting, the complementary material for the session was made available digitally on WhatsApp. In addition, two days after the meeting, a link to a video containing a summary of the topic addressed in the meeting was sent on WhatsApp as a way to remind and encourage the participant to perform the weekly activities proposed. These videos are available on the YouTube channel *Educar para Saúde* (Educate for Pain) (<https://www.youtube.com/channel/UCY2iTW--9iHpFGF1m-Uw4vQ>).

#### **Evaluation and data collection**

Initially, were collected general and sociodemographic data of the participants, which included age, gender, marital status, level of education, profession/work, and pain location. At the end of PEND, both in face-to-face and online modality, participants were asked to answer a questionnaire about satisfaction and perception. The participants were asked about their preference to answer the questionnaire: during a phone call made by the researcher, or by sending the online questionnaire link, developed on Google Forms platform, to a WhatsApp number, which the participant should access, answer, and send back to researcher.

For the satisfaction analysis achievement, 10 objective questions were developed, based on MedRisk Instrument for Measuring Patient Satisfaction With Physical Therapy Care<sup>27</sup> (MRPS -Table 2). As for the evaluation of the perception of knowledge acquired and behavioral changes that occurred during PEND, seven specific objective questions about the program were developed, such as “How much did the study on pain helped you understand pain?”, “How much has the study on pain helped you to improve your behavior in the face of pain?”, among others described in Table 3. The possible answers to the questions were selected within an increasing scale ranging from zero to 10, where 0 means “not helped” and “no improvement” and 10 means “completely helped” and “complete improvement.” Participants completed this questionnaire online via GoogleForms<sup>®</sup>.

The study was approved by Ethics Committee on Research involving Humans (*Comitê de Ética em Pesquisa envolvendo Seres Humanos* - COMEP) of Centro-Oeste State University (*Universidade Estadual do Centro-Oeste* - UNICENTRO), CAAE no 11975019.0.0000.0106. All participants received information about research participation, and signed the FICT.

#### **Statistical analysis**

For analysis of results, mean, standard deviation, median, minimum and maximum values were used, a Mann-Whitney test for intergroup comparison of continuous data, and raw values, percentages, and Chi-square test for categorical data. Biostat software was used and the significance level was  $\leq 0.05$ .

Even participants who did not complete the 10 PEND sessions were retained for data analysis.

## RESULTS

Twenty-six individuals with chronic musculoskeletal pain participated in the study, of which 13 participated in the face-to-face pain education group (FG), with a mean age of 65.31±3.8 years; and the other 13 individuals participated in the online pain education group (OG), with a mean age of 61.85±8.9 years. Both groups were composed mostly of female individuals (n=25; 96.2%). Of the 13 individuals who participated in the

OG, 11 completed participation in the 10 encounters; while in the FG the 13 individuals participated in all 10 encounters of the program. The characterization of the sample is presented in table 1.

Regarding satisfaction in participating in the pain education group, there was no difference between FG and OG for 5 of the 8 questions (Table 2).

Table 3 shows the individuals' perception of learning about the contents covered in face-to-face and online PEND.

**Table 1.** Characterization of participants in Pain Neuroscience Education Program, face-to-face and online modalities.

Variables	Face-to-face Mean (SD)	Online Mean (SD)	Chi <sup>2</sup>	p-value
Age (years)	65.31±3.8	61.85±8.9	-	0.4
Gender	n (%)	n (%)		
Female	12 (46.2)	13 (50)	1.04	0.31
Male	1 (3.8)	0 (0)		
Marital status				
Single/divorced	2 (9.1)	5 (19.2)	6.101	0.05
Married/stable union	8 (36.4)	3 (11.6)		
Widower	1 (4.5)	5 (19.2)		
Schooling				
Illiterate	1 (4.6)	0 (0)	17.862	0.02
Elementary/Up to 4 <sup>th</sup> grade	3 (13.7)	0 (0)		
Elementary/incomplete elementary school	1 (4.6)	0 (0)		
Elementary/complete elementary school	1 (4.5)	0 (0)		
High school/incomplete high school	3 (13.7)	0 (0)		
High school/complete high school	1 (4.5)	2 (7.7)		
Incomplete college degree	0 (0)	1 (3.8)		
Complete college degree	1 (4.5)	6 (23.1)		
Graduate	0 (0)	4 (15.4)		
Work				
Retired	8 (30.8)	7 (26.8)	5.867	0.319
Autonomous	0 (0)	1 (3.9)		
Employee	0 (0)	2 (7.6)		
Household	4 (15.4)	1 (3.9)		
Leave/INSS	1 (3.8)	1 (3.9)		
Other	0 (0)	1 (3.9)		
Pain location				
Spine	2 (7.7)	5 (19.2)	10.863	0.01
Lower limbs	0 (0)	5 (19.2)		
Upper limbs	4 (15.4)	1 (3.9)		
2 or more segments	7 (26.9)	2 (7.7)		

SD = standard deviation; INSS = *Instituto Nacional do Seguro Social* (Brazilian Social Security Institute)

**Table 2.** Satisfaction of individuals with chronic pain participating in the Pain Neuroscience Education Program in face-to-face and online modality.

	Face-to-face			Online			Chi <sup>2</sup>	p-value
	Agree n(%)	Undecided n(%)	Disagree n(%)	Agree n(%)	Undecided n(%)	Disagree n(%)		
I received sufficient information while participating in this intervention.	11 (42.3)	1 (3.9)	1 (3.8)	12 (46.3)	1 (3.7)	0 (0)	1.043	0.59
My physical therapist carefully explained to me the treatments I received.	13 (50)	0 (0)	0 (0)	8 (30.8)	4 (15.4)	1 (3.8)	6.19	<b>0.05</b>
My physical therapist treated me respectfully.	13 (50)	0 (0)	0 (0)	11 (42.3)	2 (7.7)	0 (0)	2.167	0.14
My physical therapist answered all my questions.	13 (50)	0 (0)	0 (0)	10 (38.5)	3 (11.5)	0 (0)	3.391	0.07

Continue...

**Table 2.** Satisfaction of individuals with chronic pain participating in the Pain Neuroscience Education Program in face-to-face and online modality – continuation.

	Face-to-face			Online			Chi <sup>2</sup>	p-value
	Agree n(%)	Undecided n(%)	Disagree n(%)	Agree n(%)	Undecided n(%)	Disagree n(%)		
My physical therapist advised me on ways to avoid future problems.	13 (50)	0 (0)	0 (0)	9 (34.6)	4 (15.4)	0 (0)	4.727	<b>0.03</b>
My physical therapist provided me with detailed instructions on my home exercise program.	12 (46.2)	0 (0)	1 (3.8)	10 (38.5)	2 (7.7)	1 (3.8)	2.182	0.34
Overall, I am completely satisfied with the services I received from my physical therapist.	12 (46.2)	1 (3.8)	0 (0)	10 (38.5)	3 (11.5)	0 (0)	1.182	0.28
I would return to this clinic for future services or treatment.	13 (50)	0 (0)	0 (0)	9 (34.6)	4 (15.4)	0 (0)	4.727	<b>0.03</b>
Satisfied with the treatment	12 (46.2)		1 (3.8)	11 (42.3)		2 (7.7)	0.377	1.00
Satisfied with the results	13 (50)		0 (0)	11 (42.3)		2 (7.7)	2.167	0.48

**Table 3.** Perception of individuals with chronic pain about the knowledge acquired and behavioral changes after participation in the Pain Neuroscience Education Program, face-to-face and online modalities.

	Face-to-face Median (min-max)	Online Median (min-max)	p-value
How much did the study on pain helped you understand pain?	9 (5-10)	8 (4-10)	0.19
How much has the study on pain helped you to improve your behavior in the face of pain?	8 (5-10)	8 (5-10)	0.28
After the study on pain, how much improvement did you notice in your quality of life?	8 (5-10)	7 (5-10)	0.24
How much has the study on pain helped you to improve your relationship with other people?	10 (5-10)	8 (3-10)	0.03
How much has the study on pain helped you to decrease negative thoughts about pain?	9 (6-10)	8 (3-10)	0.35
How much has the study on pain helped you to improve your level of physical activity?	9 (5-10)	8 (3-10)	0.03
How much has the study on pain helped you to accept your pain?	10 (6-10)	8 (3-10)	0.12

## DISCUSSION

Among the 10 items of satisfaction evaluated by PEND participants in person and online, there was agreement divergence in only three, in which the online group participants showed greater indecision in their answers. In the seven questions used to analyze the individuals' perception of learning about the content covered in Pain Neuroscience Education Program, in person and online, there was improvement in knowledge about pain in all items and in both groups. However, FG reported a superior improvement in relationships with other people, and a greater increase in the level of physical activity, compared to the OG group.

Although the minimum age inclusion criterion was different between the groups (18 years for OG; 60 years for FG), the mean age between the groups was similar. This may have occurred because the higher prevalence of CP expected in older age individuals. The mean age of the intervention participants shows that the seniors also tend to adhere to digital health strategies<sup>28,29</sup>. According to a study<sup>30</sup>, young individuals have more affinity with the use of digital health technologies, whereas young people also tend not to adhere to digital health strategies because they lose interest in the technologies more quickly<sup>31</sup>. The seniors, on the other hand, when they learn to handle a certain technology, tend to stick to it<sup>31</sup>.

Furthermore, in the present study, attention is drawn to the higher frequency of individuals with a high level of education in the OG compared to the FG (Chi<sup>2</sup>=17.862; p=0.02). A study<sup>32</sup> suggests that individuals with lower literacy levels have limited access to information technology and, consequently, to digital health<sup>32,33</sup>, and that this access becomes even more impaired when advanced age is added<sup>33</sup>. These individuals also face more comorbidities, which is justified in the present study by the presence of pain in more body segments in the FG group (Chi<sup>2</sup>=10.863; p=0.01).

From this perspective, it is important that other studies identify the reasons why individuals with higher levels of education seek online services, in order to investigate the relationship with socioeconomic status, purchasing power for information and communication technologies, barriers and facilitators in the use of technologies encountered by users, and/or the participants' level of digital literacy in health<sup>34,35</sup>.

In the present study, there was practically no difference regarding the satisfaction of individuals in having participated in the Pain Neuroscience Education Program in the two different modalities (face-to-face or online). Satisfaction data are important indicators to evaluate the quality of the service provided, besides being clinically relevant<sup>36,37</sup>. Satisfied patients tend to benefit more from the care they receive, which directly influences the way

they view the service offered to them<sup>36,38,39</sup>. However, it should be noted that although satisfaction with the care received and the clinical outcome are related, they must be evaluated separately<sup>37</sup>. This study observed that face-to-face group was more satisfied with the explanations about the treatment they received, when compared to online group. The absence of communication barriers between professional and therapist facilitates a more open dialogue, which makes patients feel more satisfied with the treatment received, because they can better understand why the chosen technique was applied<sup>40</sup>. Moreover, when there are no external barriers that hinder good communication between those involved in the therapeutic process, such as face-to-face contact, it facilitates changes in desirable habits in patients, which contributes to the prevention of future complications related to health and disease<sup>41,42</sup>. In this sense, it is important to evaluate the preference of the modality of intervention delivery from the patient's point of view, in order to obtain better communication between therapist and patient.

There is the possibility that therapist-patient communication in the OG was impaired by the fact that the use of communication technologies did not allow instantaneous speech, and that the longer time to develop a questioning may have been a factor that led the individual to rethink his doubt and give up questioning, or to stop sharing information and exposing his point of view during synchronous dialogic communication<sup>42,43</sup>. The professional who chooses to use the online modality in health service delivery should pay special attention to communication, and make sure, with the service user, that it is being clear, objective, and understood.

A systematic review<sup>44</sup> observed that satisfaction with health care is directly related to patient's participation, commitment, and adherence to treatment. Moreover, one of the contributing factors to return to other treatments is satisfaction with the experience during treatment, mentioning a good interaction between therapist, patient, and other employees and users of the service<sup>37,38,45</sup>, whose social interaction may be limited in the virtual environment. In the present study, social interaction could be identified through the question "Improved relationship with other people" (FG=10 vs OG=8,  $p=0.03$ ).

Although social interaction was higher in FG, there were increase reports in both groups. This direct interaction among people who experience the same situation allows individuals to know experiences in common and different from their own, which provides a wider view of the condition they face and, as a result, improves social participation<sup>10,46</sup>. Pain education allows the contact with different scenarios and realities, but that in common revolve around the same complaint, that is, CP<sup>46</sup>.

Other important factors in the therapeutic alliance are active listening, empathy, respect and therapist assertiveness<sup>38,41</sup>, which were evaluated through the questions "My physical therapist treated me respectfully" and "My physical therapist answered all my questions", with no difference between face-to-face and online groups.

Moreover, another factor to be mentioned and that was positive in both groups, is regarding the instructions referring to home exercises. The patient's comprehension regarding the contribu-

tion that he himself exerts on his treatment is also made possible through home care instructions given by the therapist, and thus, it provides a greater treatment engagement of the patient and contributes to active participation of all those involved in the therapeutic process, resulting in better satisfaction with the care offered<sup>39,41</sup>.

In both groups, an increased level of physical activity was reported after the end of PEND, which was even higher in FG. Physical inactivity is a condition also associated with people with musculoskeletal disorders, and it is a strong predictor for high rates of comorbidities and mortality<sup>47,48</sup>. The obstacles found and that justify the low level of physical activity in the population are presence of pain and the erroneous belief that physical activity will increase painful symptoms<sup>47</sup>.

It is also worth mentioning that the execution of this study occurred during COVID-19 pandemic, whose public health recommendation was isolation and home confinement in order to provide infection prevention measures. These period recommendations may explain the limitation to the practice of good lifestyle habits, such as physical activity, contributing to a negative impact on the individuals' health<sup>16,49</sup>. However, the participants received guidance to remain active, performing physical activity in open places or at home<sup>16</sup>. According to the present study, this practice in times of pandemic may have been stimulated in the OG through the Pain Neuroscience Education Program.

Pain education can reduce kinesiophobia by providing knowledge about the physiological and pathological mechanisms involved in pain<sup>10,46</sup>. Therefore, understanding the experience of pain from the aspect of neurophysiology and neurobiology, provides a greater involvement of individuals with prolonged pain in performing the activities of daily living, which generates an increase in the levels of physical activity, increasing functionality and decreasing disability<sup>10,46,47</sup>.

In addition, a study<sup>47</sup> reinforced that strategies to promote physical activity need to be approached differently in individuals with musculoskeletal disorders when compared to other publics. The study explained that this is necessary because of the fear of movement and the catastrophizing of pain that were built with the process of pain chronification and that hinder the participation of this population in several activities. The authors also observed that strategies to promote walking in this population can provide improvements in pain, functionality, and increase walking in the short term and, thus, reflect in future behavioral changes regarding physical activity. This improvement may be related to the social component, because the effective interaction with other people and, especially, with the professional, generates a greater possibility of supervised and structured interventions, interfering positively in the change of behavior towards physical exercise<sup>47,50</sup>. This may explain why the level of physical activity is higher in FG. Although both interventions provided the possibility of interaction, FG may have configured a more supervised program effect, taking into account the individual needs of each participant.

In both FG and OG groups, the perception regarding understanding of pain, behavior towards pain, and acceptance of pain were equally positive. The study<sup>10</sup> corroborates that pain neuros-

science education makes it possible to increase knowledge about the nature of pain and the mechanisms involved in it, and thus to promote the individual's understanding and acceptance of his or her pain or disease. So to speak, pain neuroscience education also provides an improvement in pain behavior, seen through increased pain control, and more effective self-management<sup>10,46</sup>. In this sense, digital modalities are increasingly used in the health area, because they allow a wider range of interactive and innovative resources that favor learning and behavioral change when facing health conditions, especially when dealing with individuals with CP<sup>51,52</sup>. Therefore, the use of digital technologies in health and the patient's preference must be taken into consideration when developing the patient's therapeutic plan<sup>51,52</sup>.

This study stands out for seeking information about satisfaction and perception of the Pain Neuroscience Education Program from the perspective of the user. This information is useful to ensure the quality of service and adherence to activities that are proposed throughout PEND. However, it is necessary that studies with higher methodological quality, such as randomized clinical trials, be conducted so that the results can be extrapolated. Another limitation of this study was that the groups' activities were carried out in different periods and contexts, with the online group carrying out the PEND during COVID-19 pandemic, which certainly generated a contextual bias.

## CONCLUSION

This study concluded that, in general, there was satisfaction and increased perception of improvement in different biopsychosocial aspects reported by participants of the PEND, that was offered both in face-to-face and online modality.

The results of this research emphasized that face-to-face modality promoted greater participant's satisfaction in relation to the explanation about the treatment offered, about ways to avoid future problems, and about returning for future consultations in the same modality. The face-to-face modality also provided greater individual perception regarding improvement of the relationship with other people and increase in the level of physical activity.

The present study suggests that both face-to-face and online modalities provide benefits to individuals with CP. Moreover, that communication strategies, social interaction, and personalized therapeutic planning should be considered to increase satisfaction and adherence to the intervention in online modality.

## AUTHORS' CONTRIBUTIONS

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Data Collection, Conceptualization, Resource Management, Methodology, Writing - Preparation of the Original, Writing - Review and Editing

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