Evaluation of an on-line resource for pain education by health professionals and people with musculoskeletal pain

Avaliação de um instrumento on-line para educação em dor por profissionais de saúde e pacientes com dor musculoesquelética

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ABSTRACT

BACKGROUND AND OBJECTIVES: Educational interventions delivered over the Internet have the potential to facilitate access to precise information for people with pain. The aim of this study was to evaluate the opinion of health care professionals and the perception of pain comprehension and the behavior modification of patients with musculoskeletal pain related to the on-line resource "*Caminho da Recuperação*" (Path of Recovery).
METHODS: Health care professionals and patients with musculoskeletal pain were selected through the Internet. The professionals judged the quality of the instrument's content considering the concepts of pain education based on neuroscience using a Likert scale. People with pain used an 11-point scale (the higher the value, the greater the perception) to evaluate how the on-line resource contributed to change. Data was presented through descriptive analysis.
RESULTS: The samples were composed of 81 health care professionals and 170 individuals with pain. In the group composed of people with musculoskeletal pain, the perception of the pain comprehension presented the highest mean value (6.7 / 10) and the return to physical activity the lowest mean value (5.2 / 10).
CONCLUSION: The on-line resource was rated as excellent by health care professionals in all items. People with pain have noticed a greater shift towards comprehending pain, behavior and negative thoughts. The lowest perceptions occurred in terms of return to daily activity, exercises and improving relationships.

Keywords: Chronic pain, Health education, Internet, Pain, Patient education. Remote intervention.

RESUMO

JUSTIFICATIVA E OBJETIVOS: As intervenções educativas via Internet apresentam potencial para facilitar o acesso a informações adequadas para as pessoas com dor. O objetivo deste estudo foi avaliar a opinião de profissionais de saúde e a percepção da compreensão da dor e a modificação de comportamento de pacientes com dor musculoesquelética relacionadas ao instrumento on-line Caminho da Recuperação.
MÉTODOS: Participaram do estudo profissionais de saúde e pacientes com dor musculoesquelética selecionados pela Internet. Os profissionais julgaram a qualidade do conteúdo do instrumento considerando os conceitos da educação em dor com base em neurociência usando uma escala Likert. As pessoas com dor utilizaram uma escala de 11 pontos (quanto maior o valor, maior a percepção) para avaliar o quanto o instrumento contribuiu para mudança. Os dados foram apresentados por meio da análise descritiva.
RESULTADOS: Participaram 81 profissionais de saúde e 170 pessoas com dor. Para as pessoas com dor musculoesquelética a percepção do entendimento sobre a dor apresentou o maior valor médio (6,7/10) e o retorno para a atividade física o menor valor médio (5,2/10).
CONCLUSÃO: O instrumento foi avaliado como excelente por profissionais de saúde em todos os itens. As pessoas com dor perceberam maior mudança para o entendimento da dor, o comportamento e os pensamentos negativos. As menores percepções ocorreram para retorno à atividade diária, aos exercícios e melhora dos relacionamentos.

Descritores: Dor, Dor crônica, Educação em pacientes, Educação em saúde, Internet, Intervenção remota.

INTRODUCTION

Chronic pain (CP) can be considered a public health problem with economic implications and represents one of the main reasons for seeking health services[1,2]. Musculoskeletal pain (MSP)

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affects people in all age groups and contributes to high levels of disability[2,3]. In Brazil, chronic MSP is one of the main causes of disability retirement[4]. In most cases, it's not possible to establish a single cause because pain is an individual experience influenced not only by biological factors, but also by cognitive, emotional, behavioral, environmental and social factors[5].

In 2015, the International Association for the Study of Pain (IASP) recognized the need to expand access to specialized services and the availability of appropriate self-management information for people suffering from CP[6]. This includes educational strategies such as Pain Neuroscience-based Education (PNE)[6], which aims to reduce the threat value caused by pain, pain-related catastrophic thoughts and pain-related fear, increase self-efficacy and contribute to the development of appropriate behavioral coping strategies[6]. Despite the clinical benefits reported in the literature, PNE is still limited to specialized pain management services, and there is a need to increase access to these specialized services for people suffering from pain. One way to deliver this content and increase access is to use remote interventions. Interventions that utilize the Internet, known as e-health, contribute to reduce geographical barriers, economic differences, and are available 24 hours a day every day of the week[7].

Internet-based educational and self-management interventions for people with PNE can be a resource for individuals with CP. Studies[8] have highlighted that internet-based behavioral interventions were effective in reducing pain, disability, depression symptoms, and anxiety symptoms for CP conditions in adults. Despite current evidence, initiatives in Brazil for the online development and delivery are scarce. The *Pesquisa em Dor* (Pain Research) group has developed a free online tool to facilitate access to information on pain, as well as behavioral and coping strategies[9]. This tool was developed by a team of physical therapists, psychologists, and physical therapy students and focuses on specific points related to the experience of pain such as acceptance, knowledge about the neurophysiology of pain, sleep hygiene, stress, and negative emotions, coping strategies, exercise, effective communication, and how to deal with the increase of symptoms.

The aim of this study was to evaluate the opinion of health care professionals and the perception of pain comprehension and the behavior modification of patients with musculoskeletal pain related to the on-line resource *Caminho da Recuperação* (Path of Recovery).

METHODS

Cross-sectional observational study that followed the recommendations of Strengthening the Reporting of Observational Studies in Epidemiology[10]. Data collection occurred between March and August 2019.

Healthcare professionals and people of both genders with complaints of MSP, aged 18 years or older, were invited to participate in the study. Recruitment of participants from both groups occurred through calls on social media such as Facebook and Instagram. Healthcare professionals were required to state that they were regularly registered in their professional council and provided healthcare for people with MSP in their clinical practice. The patients group was composed of people with complaints of MSP such as pain in muscles, bones, ligaments or joints. Participants in both groups were required to have adequate digital literacy to access the portal and to complete an online questionnaire. Incomplete answers and those that were not related to the question were excluded. All the research objectives and procedures were presented to the participants who, upon agreeing to participate, signed the Free and Informed Consent Term (FICT).

Participants were asked to explore the content of the online instrument available on the website of the *Pesquisa em Dor* group (www.pesquisaemdor.com.br) and then answer a questionnaire that contained common questions for both groups, such as identification and sociodemographic data. Then the form was directed to questions specific to health professionals or to people with chronic MSP.

The health professionals' questionnaire aimed to collect professional data and their opinion on the evaluation of the website, including questions about the presentation of the resource and the content of information. The first part of the instrument was composed of six questions related to professional practice, such as area of work, time in the profession, place of work, and familiarity with the concepts of PNE. The second part of the questionnaire included 16 questions about the evaluation of the quality of the information content of the online instrument, such as: the quality of the portal, content and quality of the information provided, and contact with the authors. These items were evaluated using a Likert scale graded as excellent (5), good (4), regular (3), bad (1), and poor (0)[11].

The questionnaire applied to people with pain aimed to characterize the pain and verify the perception of how much the online intervention contributed to their comprehension of pain, symptom self-management and behavior modification. The instrument was composed of a total of 23 questions. The first section is destined to questions related to the characterization of pain, such as duration, location, intensity, and questions related to emotional, cognitive and lifestyle factors such as anxiety, stress, depression, catastrophizing, kinesiophobia, sleep, lifestyle and influence of pain in their daily life activities. The second, to the questions related to the perception of the influence of the instrument in coping with pain and the emotional and behavioral factors associated.

The evaluation of psychosocial factors related to pain was performed by the Brief Screening Questionnaire (BSQ)[12], which covers the evaluation of the presence of symptoms of depression (*During the past month, have you felt uncomfortable by feeling down, depressed, or hopeless? During the past month have you often felt uncomfortable due to little interest or pleasure in doing things*?), social isolation (*Do you feel isolated from society*?), anxiety (*Do you feel anxious*?), stress (*Do you feel stressed*?), kinesiophobia (*Physical activities can harm me. I shouldn't do physical activities because it might make my pain worse*), and catastrophizing (*When I feel pain, it's terrible and I think it will never get better. When I feel pain, I think I can't take it anymore*)[13]. The instrument is formed by nine items, being one item for anxiety, two items for kinesiophobia, one for stress, one for social isolation, two for catastrophizing, and two for depression[12,13].

The BSQ presented, respectively, sensitivity and specificity of 80.0 to 78.3% for the anxiety domain, 73.3 to 94.7% for the depression domain, 81.5 to 81.0% for social isolation, 88.0 to 91.0% for catastrophizing, and 86.7 to 93.4% for kinesiophobia[12]. For the stress domain, the sensitivity was 71.2% and the specificity 70.6%[14]. The questions and the validation of the brief instrument were performed through the comparison of the isolated domains with standard reference questionnaires for each assessment. For each question, a response between zero and 10 could be assigned. Zero represents "never or not at all", gradually increasing to 10, which represents "always or a lot". For each domain, a cutoff point was established from the analysis performed on the ROC curve in the validation of the questionnaire, with the value 5 for the characterization of anxiety, 4 social isolation, 8 depression, 4 catastrophizing, 8.5 kinesiophobia[12] and 7 stress[14]. The evaluation of how the online instrument contributed to the comprehension of pain, symptom self-management and behavior modification was composed of 7 questions. The participants were instructed to indicate their perception on a scale of zero to 10. The higher the value, the greater the perception that the instrument contributed to these aspects.

The research protocol was previously submitted and approved by the Ethics Committee of the Federal Institute of Education, Science and Technology of Rio de Janeiro (IFRJ) (CAAE: 51506015.4.0000.5268).

Statistical analysis

Data was processed and coded in a Microsoft Office Excel spreadsheet, version 2013 for Windows and analyzed using the Statistical Package for Social Science (SPSS), version 20 for Mac. Results are presented descriptively according to frequency, central tendency, and dispersion analyses.

RESULTS

A total of 81 health professionals participated in the study, 47 (58.0%) males and 34 (42%) females. Most had only undergraduate degrees (n=61; 75.3%), and 78 (96.2%) were physical therapists, 2 (2.4%) nurses, and 1 (1.2%) psychologist. 32 (39.5%) had more than 10 years of professional practice, 22 (27.2%) from six to 10 years, and 27 (33.3%) up to five years. Regarding the concepts, training in PNE and cognitive behavioral therapy, 64 (79.0%) said they were familiar with the concepts, 29 (35.8%) reported having received some training in PNE, and 21 (25.9%) received training in applying cognitive behavioral therapy to people with CP. The assessment of online intervention by professionals is shown in table 1.

In total, 177 people suffering from pain answered the questionnaire. Seven had to be excluded because the questionnaire was incomplete or contained answers unrelated to the question. Among the 170 participants, 127 (74%) were female and 43 (25.3%) were male, the majority from the southeast region of Brazil (n=110; 64%), followed by the south (n=22;12.9%) and center-west (n=16; 9.4%). As for the level of schooling, they had graduate (n=72; 42%), undergraduate (n=64; 37.6%), high school (n=32; 18%), and first grade (n=2; 1.2%) degrees. 147 (86.6%) participants reported experiencing pain for more than three months.

The area of the body with the highest pain rate was the spine (n=118; 69%), followed by the lower limbs (n=74; 43%) and upper limbs (n=61; 35%). The mean pain intensity was 5.2±2.62. As for psychosocial factors, the mean of anxiety symptoms was 6.3±2.72, of depression symptoms, which includes the questions "*During the past month, have you often felt down, depressed, or hopeless?*" and "*During the past month, have you felt*

Table 1. Evaluation of the online intervention by health professionals (n=81)

Variables	Evaluation n (%)			
	Bad	Regular	Good	Excellent
Contact with the author	5 (6.2)	11 (13.6)	25 (30.9)	40 (49.3)
Adequacy of information	-	-	18 (22.2)	63 (77.8)
Organization and identification of information	-	2(2.5)	20 (24.6)	59 (72.8)
The link is adequate	-	2 (2.5)	21 (25.9)	58 (71.6)
Quality of information is guaranteed by the queried references	1 (1.2)	1 (1.2)	14 (17.2)	65 (80.2)
Graphic design of the website	-	3 (3.7)	25 (30.9)	53 (65.4)
Images add to the knowledge of the texts	-	4 (4.9)	13 (16)	64 (79)
Images match the texts	-	-	21 (25.9)	60 (74)
Site navigation	-	4 (4.9)	25 (30.9)	52 (64.1)
Keeps user attention	-	4 (4.9)	26 (32)	51 (62.9)
Organization of information	-	3 (3.7)	18 (22.2)	60 (74)
Quantity of information covers subject matter well	-	4 (4.9)	15 (18.5)	62 (76.5)
Reliable information and knowledge to the user	-	2 (2.5)	14 (17.2)	65 (80.2)
Up-to-date information	-	2 (2.5)	7 (8.6)	72 (88.9)
Research sources are credible	1 (1.2)	1 (1.2)	11 (13.6)	68 (83.9)
Information is free of grammatical errors	-	1 (1.2)	15 (18.5)	65 (80.2)

None of the variables were classified as ''poor" and that column was not present in the table.

uncomfortable or had little interest or pleasure in doing things?" was 5.07±3.58 and 6.14±3.0, respectively. The mean of perceived stress was 6.30±0.87, the mean of movement-related fear was 2.63±3.14, and the mean of pain-related catastrophic thoughts was 5.07±0.84 (Table 2).

Table 2. Characterization of pain and psychosocial factors involved in the pain experience of participants with musculoskeletal pain

Variables – zero to 10	Mean ± SD
Indicate the number that best represents your pain at the moment.	5.2 ± 2.62
Do you feel anxious?	6.3 ± 2.72
Do you feel stressed?	6.3 ± 2.73
Can physical activity harm you?	2.6 ± 3.14
When you feel pain, is it terrible and do you feel that it will never get better?	5.0 ± 3.58
During the past month, have you often felt down, depressed, or hopeless?	5.6 ± 3.37
During the past month, have you felt uncomfortable or had little interest or pleasure in doing things?	6.1 ± 3.0
Level of exercise	4.4 ± 3.2
Level of daily activities	6.4 ± 2.82
How much does pain influence your sleep?	5.1 ± 3.59
How much does pain influence your sexual activity?	4.2 ± 3.8
How much does pain influence your appetite?	3.3 ± 3.42
How much does pain influence your mood?	6.3 ± 3.22
How much does pain influence your relationships with other people?	5.2 ± 3.35

SD = standard deviation.

Table 3 presents the evaluation of how the online instrument contributed to pain comprehension, symptom self-management, and behavior modification. The highest mean values were for questions related to pain comprehension (mean = 6.7±2.78), behavior change (mean = 6.6±2.70), and negative thoughts (mean = 6.1±3.09).

Table 3. Evaluation of the perception of how the online instrument contributed to pain comprehension, symptom self-management, and behavior modification

Variables – zero to 10	Mean ± SD
How much did the instrument helped you comprehend pain?	6.7 ± 2.78
How much did the instrument helped you improve your behavior towards pain?	6.6 ± 2.70
How much did the instrument helped you decrease negative thoughts about pain?	6.1 ± 3.09
How much did the instrument helped you return to your daily activities?	5.4 ± 3.16
How much did the instrument helped you improve your level of physical activity?	5.2 ± 3.17
How much did the instrument helped you improve your relationship with people?	5.2 ± 3.30

SD = standard deviation.

DISCUSSION

For the health professionals, most of the items were evaluated as excellent and none of the items were considered poor. According to the patients' perception of the usefulness of the instrument, the items related to the comprehension of pain, improvement of behavior towards pain and negative thoughts were those that presented the best results. The items related to the return to daily activities, level of physical activity and relationship with people were the items with the lowest scores. Although the results were considered by the professionals to agree with the PNE concepts and self-management strategies, the sample of professionals was composed mostly of physical therapists, because, although PNE is not exclusive to any of the health professions, physical therapists seem to be more familiar with and apply PNE more frequently in their clinical practice[15]. As for the patients, the perception regarding the content showed that the online instrument contributed mainly to a better comprehension of pain, improved behavior, and improved negative thoughts. Interestingly, although the participants judged that the instrument helped modify behavior, this did not seem to be enough for them to perceive an effective change with a return to daily activities and physical activities. It's possible that this perceived behavioral change is more related to the comprehension of the painful experience, since the item on "how much did the instrument helped you comprehend pain?" was the one that presented the highest mean. In fact, the literature presents evidence that PNE concepts must be accompanied by strategies of exposure to activities to result in changes in disability levels and lifestyle[16-18].

Evidence of benefit from the use of online resources and their effects on clinical outcomes are already reported in the literature. The study[19] evaluated the effectiveness of psychological therapies delivered over the Internet and found a small effect size (SMD = -0.37, 95% CI = -0.59 to -0.15) for pain relief, post-treatment improvement in disability levels with moderate effect size (SMD=-0.50, 95% CI=-0.79 to -0.20) and small effect size for depression and anxiety symptoms (SMD=-0.19, 95% CI=-0.35 to -0.04; SMD=-0.28, 95% CI =-0.49 to -0.06, respectively). Other studies have also found similar effects for pain intensity[20-22] and disability[20].

Until the present moment, there are no studies in Brazil on the evaluation of an online instrument for people with pain considering the information and concepts of PNE. The instrument is free, available for access and can contribute as a resource to help professionals in their clinical practice. The availability of easily accessible and highly available tools can help professionals and patients in various situations. A current example was the need for remote strategies for the care of people suffering from pain during the SARS-CoV-2 pandemic. Therefore, the instrument becomes a promising intervention[23,24].

The study has limitations, because it was not possible to control the frequency or duration of access of the participants with pain. It was also not possible to know if these patients received help from a professional or if they used the resource independently, nor if they were receiving any type of treatment

for pain that may have influenced results. Most participants with MSP were highly educated at the undergraduate or graduate level. It's possible that in people with lower education the results are different. Another factor to be considered is that the group of health professionals was composed mostly of physical therapists, and it's necessary to explore the perception of other health professionals.

There are some gaps for clinical practice that need to be explored in future studies. This study did not aim to test the effectiveness of the intervention. Thus, it's necessary that the online instrument be tested in a clinical trial as a remote strategy and that clinical outcomes such as pain intensity, disability, self-efficacy, and others are used. Another point that still needs clarification is the need for support from a professional for the use of online resources of pain self-management. Studies with online interventions based on cognitive behavioral therapy for mental health disorders and mood disorders show conflicting results on whether or not the health care professional is required[25]. However, this is not yet clear for people with pain. Therefore, it's important that future studies identify the degree of support needed, without supervision, with limited supervision, and with supervision for online pain interventions in Brazil. Other points that still need to be clarified are the usability and barriers that patients may face when using this type of resource, as well as differences in outcomes comparing levels of education and socioeconomic conditions.

CONCLUSION

The online instrument was rated as excellent by health care professionals on all items. For patients, the instrument contributed to the comprehension, behavior and change of negative thoughts related to pain. However, items related to return to daily activity, exercise, and improved relationships presented a lower score.

AUTHORS' CONTRIBUTION

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Statistical analysis, Data collection, Writing - Preparation of the original
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Statistical analysis, Writing - Review and Editing
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Conceptualization, Project Management, Methodology, Supervision, Visualization

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