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Global Postural Re-education: a literature review

Reeducação postural global: uma revisão da literatura

Rosana M. Teodori¹, Júlia R. Negri², Mônica C. Cruz³, Amélia P. Marques⁴

Abstract

Background: The Global Postural Re-education (GPR) method has been widely used in clinical practice, with reported benefits for prevention and rehabilitation of musculoskeletal dysfunctions. In parallel with almost two decades of clinical implementation, research studies have tested and verified the effectiveness of GPR in treating different clinical conditions and have also compared this method with other physical therapy resources. However, few studies focused on the verification of the principles of mechanisms of action defended by the author of the method making the arguments in favor of the method weak. **Objective:** To perform a critical systematic review of the effects of physical therapy intervention that use the GPR method. **Methods:** We searched Medline, SciELO, LILACS and PeDRO, from 2000 to 2010, considering the key words: Global Postural Re-education, global and active stretching. **Results:** We found 25 studies, 13 about GPR and 8 about global and active stretching in addition to three books and a thesis. After analysis, 20 references were included. **Conclusions:** Some of the studies indicated that the GPR method was more effective than other physical therapy interventions, while others demonstrated similar results of GPR when compared to other physical therapy interventions. Studies showed benefits of the GPR in improving the respiratory muscle strength, chest expansion, maximal respiratory pressure and in reducing pain, loss of urine in incontinent women, increasing flexibility, the electromyographic activity in temporomandibular disorders and postural stability in lower limb orthopedic alterations. Methodological limitations observed suggest the need for greater rigor in future research.

Keywords: Global Postural Re-education; global stretching; active stretching.

Resumo

Contextualização: O método de Reeducação Postural Global (RPG) tem sido utilizado na clínica com relatos de benefícios para a prevenção e recuperação de disfunções musculoesqueléticas. Após duas décadas de aplicação, estudos têm verificado sua eficácia no tratamento de diferentes condições clínicas e ele tem sido comparado com outros recursos fisioterapêuticos. Entretanto, são poucos os estudos voltados à comprovação dos princípios defendidos pelo autor do método, o que torna frágeis as argumentações em favor dele. **Objetivo:** Realizar, com base na literatura científica, uma análise crítica dos efeitos da intervenção fisioterapêutica utilizando o método RPG. **Métodos:** Pesquisaram-se as bases de dados Medline, SciELO, LILACS e PeDRO, de 2000 a 2010, considerando os unitermos: RPG, alongamento global e alongamento ativo. **Resultados:** Foram encontrados 25 estudos, sendo 13 relacionados ao método RPG e oito aos alongamentos global e ativo, além de três livros e uma tese. Após análise, 20 referências foram utilizadas. **Conclusões:** Parte dos estudos aponta que o método RPG é mais efetivo, enquanto outros mostram resultados similares a outros métodos de intervenção fisioterapêutica. Estudos indicam benefícios do método na melhora da força muscular respiratória, expansibilidade torácica, mobilidade toracoabdominal e da pressão respiratória máxima, além de reduzir a dor, a perda de urina em mulheres incontinentes, melhorar a flexibilidade, a atividade eletromiográfica nas disfunções temporomandibulares e a estabilidade postural em alterações ortopédicas de membros inferiores. Limitações metodológicas observadas sugerem a necessidade de maior rigor em futuras pesquisas.

Palavras-chave: reeducação postural global; alongamento global; alongamento ativo.

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¹Post-graduate program of Physical Therapy, Faculty of Health Sciences, Universidade Metodista de Piracicaba (UNIMEP), Piracicaba, SP, Brazil

²Department of Physical Therapy, Faculty of Americana (FAM), Americana, SP, Brazil

³Department of Physical Therapy, Universidade da Amazônia (UNAMA), Belém, PA, Brazil

⁴Department of Physical Therapy, Speech Therapy and Occupational Therapy, Faculty of Medicine (FM), Universidade de São Paulo (USP), São Paulo, SP, Brazil

Correspondence to: Rosana Macher Teodori, UNIMEP, Faculdade de Ciências da Saúde, Programa de Pós-graduação em Fisioterapia, Laboratório de Plasticidade Neuromuscular, Rod. do Açúcar, Km 156, Taquaral, CEP 13.400-911, Piracicaba, SP, Brasil, e-mail: rteodori@unimep.br

Introduction ...

In the early 50's, the French physical therapist Françoise Mézières developed through careful observation, an proposal that revolutionized the way to exercise the body: the anti gymnastique. The innovation proposed by Mézières was based on the following observation: each time and individual tried to decrease the curvature of a spinal segment, the curve moved to another segment. Thus, it was necessary to consider the body as a whole and approach it as such. In this theory, all deformations are caused by a shortening of the posterior muscles as an inevitable consequence of daily movements¹.

Philippe-Emmanuel Souchart taught the Mézières Method for 10 years at the Mézières Center, in southern France. He substantiated the GPR method on his deep knowledge of anatomy, biomechanics, kinesiology and osteopathy. Fields that allowed him to base the method now known as the Global Posture Re-education (GPR)².

Conventional physical therapy often uses static stretching, which consists of stretching a single muscle or muscles group until a tolerable point and sustained it for approximately 30 seconds³. The GPR method is based on the global stretching of anti gravitational muscles and the stretching of muscles that are organized on muscle kinetic chains for approximately 15 to 20 minutes. In both cases, compensations are not allowed⁴.

Many physical therapists in Brazil and in other countries have used the GPR method with satisfactory results. Although the method is widely used clinically, the literature is still scarce and provide controversial results or results that do not support the use of GPR over segmental stretching.

The objective of this study is to perform a critical literature review of the effects of the physical therapy technique named GPR.

Methods ...

Medline, SciELO, LILACS and PeDRO databases as well as books and theses were searched for the period between 2000 and 2010 using the keywords: GPR, global stretching and active stretching. The articles were selected by reading the abstract excluding those that did not use GPR or did not clearly report the research methods.

Results ...

Twenty-five studies were identified and from those 13 used the GPR method (two literature reviews, one case study

and ten clinical trials) and 8 used global and active stretching. There were also three books and one thesis. Based on the exclusion criteria 5 studies were excluded and therefore 20 were included in the review. The types of study, methodology and main results for the studies involving the GPR method are shown in Table 1.

Discussion ...

Qualitative and quantitative analysis that use scientifically accepted methods are essential to provide scientific evidence to therapeutic intervention. Studies with such characteristics have been published more frequently over the last decades. The work by Teodori et al.⁵ presented quantitative data on chest expansion and maximal respiratory pressures and demonstrated the positive effect of a single session of the "frog on the floor with closed arms" posture, on respiratory muscle strength and thoracic mobility in healthy individuals. Souchart⁶ believes that changes in respiratory mechanics are due to excessive shortening of the respiratory muscle chain. Considering that the shortening of the anterior-inner arm chain may contribute to the limitation of chest expansion, Moreno et al.⁷ studied the effect of the posture "frog on the floor with open arms" to increase stretching of the respiratory chain muscles. The increase in maximal respiratory pressures and chest expansion reported reinforces the importance of the chosen posture, as well as a longer treatment program rather than a single session of stretching. The results also provide support for establishing appropriate sessions length for treatment in the clinic.

In the study by Fozzatti et al.⁸ there was no definition of which postures of the GPR method were used; the women's age ranged from 23 to 72 years, which can affect muscle condition and its response to treatment; and the complaint time of stress urinary incontinence (SUI) ranged from 1 to 23 years, which may reflect the diversity of functional condition of the pelvic floor muscles. Furthermore, the authors did not mention whether the women were nulliparous, and the study had no control group. Despite these limitations it is still possible that the GPR method favors a balance between the lumbar lordosis, the rotation axis of hip joints, the transverse abdominal muscles and the mobility of the thoracic diaphragm, both responsible for maintaining intra-abdominal pressure, as discussed by the authors of the study. However, it is essential that the inclusion criteria are strictly considered when selecting patients to participate in scientific studies.

In the study by Fozzatti et al.⁹ in which all of the postures of the GPR method were used with an emphasis on those that

Table 1. Description of study type, methods and main results.

Autor/Year	Type of study	Procedure	Main Results
Teodori et al. ⁵	Clinical Trial	1 GPR session in supine posture	Increase in chest expansion and respiratory muscle strength in healthy young women
Rosário, Marques, Maluf ³	Literature Review	————	Best options are segmentar static stretching, global stretching and proprioceptive neuromuscular facilitation; ideal time to stretch around 30 minutes
Teodori, Guirro e Santos ¹⁸	Case Study	1 GPR session in supine posture and standing postures	Recovery of balance in plantar pressure distribution; need for more sessions per week
Fernández-de-Las-Peñas et al. ¹²	Randomized Clinical Trial	15 GPR sessions x strengthening, flexibility and chest expansion exercises	Increased flexibility in patients with ankylosing spondylitis
Moreno et al. ⁷	Randomized Clinical Trial	16 GPR sessions in supine posture	Increased maximal respiratory pressures and measures of thoraco abdominal circumference
Cabral et al. ¹⁰	Clinical Trial	16 GPR sessions in supine and leaning forward postures x segmentar stretching of posterior muscles	Both treatments promoted an improvement of functional capacity, flexibility of the hamstring muscles and the Q-angle. The global stretching reduced the severity of patellofemoral pain and increased flexibility without changing the electromyographic activity of the posterior chain muscles
Vanti et al. ¹³	Literature Review	————	Effective method for the treatment of musculoskeletal diseases. Scarcity of rigorous experimental tests merely arguable conclusions
Cunha et al. ¹⁵	Randomized Clinical Trial	12 GPR sessions x static stretching, both associated to manual therapy	Both promoted relief of chronic neck pain and improved neck mobility
Fozzatti et al. ⁸	Clinical Trial	18 GPR sessions	Improved general health perception and reduced urine loss by stress in women with urinary incontinence
Rosário et al. ¹⁴	Comparative Study	8 GPR sessions in supine and sitting postures x static stretching	The flexibility, range of motion and muscle strength of lower limbs were similar in both types of stretching
Mota et al. ¹⁷	Clinical Trial	Single session of GPR in sitting posture	Elevation of diastolic and systolic pressure, mean and double product during GPR posture with a return to resting values in the first 5 minutes post-posture
Fozzatti et al. ⁹	Cohort	12 GPR sessions x pelvic floor muscle training	Further reduction of urine loss in incontinent women treated by with GPR
Maluf et al. ⁴	Randomized Clinical Trial	Static stretching exercises x 8 GPR sessions	Both treatments reduced the temporomandibular head and neck pain, and muscles electromyographic activity

GPR=Global Postural Re-education.

simulated daily activities that provoke incontinence (standing, sitting, bending forward), there was an improvement in flexibility, elasticity and strength of the pelvic floor muscles. In this study, the number of deliveries ranged from zero to nine, most of them of vaginal type. But the patients' age ranged widely (30 to 72 years), as well as the symptoms duration time (1 to 20 years). These limitations are common in clinical trials because even in specialized attention centers of certain health disorder, such as in SUI, there is great variability of the patient population. It is attributed to the postures performed, the role of rebalance between the structures of the lumbar spine and pelvis affecting the response of the pelvic floor muscles to stress and variations in intra-abdominal pressure. The authors suggested the need for further controlled studies in view of the advantages of the GPR method as it is not invasive and does not produce side effects.

The results obtained by Cabral et al.¹⁰ in women with patellofemoral syndrome showed that the GPR method

promoted a decrease in pain that was attributed to the overload of proprioceptive stimuli especially produced by the "skier" posture. This result is of extreme importance for clinical practice and favors the selection of the GPR method. Pain after injury can predispose muscle spasm restricting joint movement. McHugh and Cosgrave¹¹ emphasized that stretching promotes increased joint range of motion due to decreased passive resistance to stretching, ie, decrease in muscle stiffness or increase in muscle compliance, especially when the duration of stretching is longer, contributing to pain decrease, which reinforces the results obtained in the study by Cabral et al.¹⁰. However, other mechanisms related to the decrease in pain need to be studied within the global stretching scope, which would reaffirm the GPR method as a form of preferential treatment in various postural disorders and orthopedic conditions.

Most studies included in this review were randomized clinical trial and the most common objective was to compare

the effectiveness of the GPR method with other resources, considered by the author as “conventional”. The results obtained in some of these studies confirmed the benefits of the method^{5,7,10,12,13}, while others suggested that the treatment was similar to other conventional resources^{4,14,15}.

Even considering the studies in which interventions based on the GPR method were found to be effective, one must carefully analyze the study’s method. In this respect, it is observed that, in most of the studies considered here, the intervention method was based on one or two postures advocated by the GPR method, previously set for implementation on all subjects that comprised the sample. Since the choice of postures employed in a GPR session depends on data obtained in specific examination, consisting of history, postural assessment and correction maneuvers¹⁶, the inclusion of subjects into groups subjected to a common therapeutic approach should take in consideration subgroups of patients with similar postural patterns and with indication for the treatment through the investigated postures. However, only the study by Moreno et al.⁷ used postural patterns as an inclusion criterion for sample selection.

Another aspect to consider is the “sessions length”, which ranged from 20¹⁷ to 60 minutes¹⁵. In five clinical trials the intervention time was less than 50 minutes^{4,5,7,10,17}. As the prolonged time of maintenance of stretch is one of the arguments in favor of the GPR method, it is noteworthy that in two of the trials with shorter sessions^{5,12} the results of the intervention favored the GPR method with respect to the investigated parameters.

The number of sessions also varied, as well as reports of follow-up after the intervention. Teodori, Guirro and Santos¹⁸ found the presence of muscle rebalance after a single session of GPR, with progressive loss of results in the weeks following the intervention. Maluf et al.⁴ applied eight sessions of GPR in patients with temporomandibular disorders, noting improvement in pain and in electromyographic activity of muscles involved in the joint, but during the following two months there was a slight decrease of the gains.

A common concern of physical therapists after corrective intervention is how long the result are maintained. Timson¹⁹ argues that the increase in the number of sarcomeres in series and reorganization of collagen after sustained stretching usually are reversed when the stimulus to stretching is removed. Ben and Harvey²⁰ performed daily sessions of 30 minutes of sustained stretching for six weeks on healthy and active individuals and observed an increase in discomfort tolerance associated with stretching, but no increase in muscle extensibility, which suggests the need for

a treatment program involving a larger number of treatment sessions when using the GPR method.

Cunha et al.¹⁵ found similar results in chronic neck pain and neck mobility when comparing the effects of global stretching and conventional static stretching, both in combination with manual therapy. In this study, unlike what was observed in others studies, all gains were maintained six weeks after the end of treatment.

It is also important to consider other differences observed between the different methodologies used in the studies. In the study by Fernández-de-Las-Peñas et al.¹², the intervention was applied in groups of patients with ankylosing spondylitis. The groups were supervised by the therapist during the performance of postures (standing with anterior tilt, frog in the air, frog on the floor, sitting and standing against the wall) with the absence of manual contact. The manual contact of the therapist has an important role in tactile and proprioceptive stimulation, facilitating the perception of movements and postures that need to be corrected during the stretch. Thus, it would be interesting to investigate whether the individualized intervention could bring even greater benefit to these patients.

Regarding the clinical trials, criteria related to the methodological quality of the studies, such as the presence of sample size calculation^{5,8,10,12,17}, control group^{8,17} and the blinding of the researchers responsible for results assessment^{5,8-10,17} were attended by only a portion of the studies reviewed which limits the conclusion of this review regarding the effectiveness of the method suggesting the need for greater methodological rigor in future studies.

Conclusion ...

The results of some of the reviewed studies suggest that the GPR method is more effective under the analyzed conditions while the results of others suggest that the GPR method has similar results as segmental stretching. The studies reported benefits of GPR in improving respiratory muscle strength, chest expansibility, thoracic and abdominal mobility and maximal respiratory pressure, as well as decrease in pain and in urine loss in women with urinary incontinence and improvement in flexibility, in electromyographic activity in temporomandibular disorders and in postural stability in lower limb orthopedic disorders.

In most studies, there was no detailed description of the GPR postures performed limiting comparison between the different studies.

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