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Preventive physical therapy and care humanization in the treatment of a bedridden, home care, neurologic patient

Fisioterapia preventiva e humanização do cuidado em paciente neurológico acamado domiciliar

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Abstract

Introduction: This case study investigated the impact of preventive physical therapy on shoulder problems and the prevention of pressure ulcers (PU) in a bedridden, home care, post-neurological surgery patient. **Objective:** To highlight the importance of physical therapy in the prevention of comorbidities, chronic neurological sequelae, and PU. **Materials and Methods:** In the immediate post-surgical phase, the patient was treated with preventive measures against PU, according to the Pressure Ulcer Prevention Protocol of the University of São Paulo, the National Pressure Ulcer Advisory Panel, and the Braden Scale. In addition, we used the modified Ashworth scale to assess spasticity. A kinesiotherapy program based on the Bobath's concept was used to prevent subluxation of the plegic arm and help in the recovery of functional movements. **Results:** The use of preventive measures and delivery of humanized care during a six-month period helped

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prevent the development of stage 3 and 4 PU and physical, functional, and respiratory complications. By the end of six months, the patient was found to be at low risk of developing PU. **Conclusion:** Notwithstanding the difficulties experienced during treatment, especially for the positioning of the arm and performance of transferring and positioning techniques, the results of this study are in agreement with aspects considered important for treatment outcomes.

Keywords: Humanization of assistance. Primary health care. Delivery of health care.

Resumo

Introdução*: O presente estudo é um relato de caso sobre a atuação da Fisioterapia Preventiva nos problemas de ombro na hemiplegia e na prevenção da úlcera por pressão (UP), em um paciente pós-neurocirúrgico restrito ao leito domiciliar.* ***Objetivo:*** *destacar a importância da fisioterapia na prevenção das comorbidades em sequelas neurológicas crônicas e UP.* ***Materiais e Métodos:*** *no pós-operatório imediato foram aplicadas medidas para evitar UP, com base no Protocolo de Ensino para Prevenção e Tratamento de Úlcera de Pressão, no National Pressure Ulcer Advisory Panel e na Escala de Braden. Para avaliação da espasticidade foi utilizada a Escala Modificada de Ashworth. Com base no conceito Bobath, um programa cinesioterapêutico buscou prevenir a subluxação do braço plégico e a recuperação dos movimentos funcionais.* ***Resultados:*** *Durante o período de seis meses, as medidas preventivas e o cuidado humanizado evitaram o desenvolvimento de UP nos estágios III e IV, além de complicações físico-funcionais e respiratórias. Ao final de seis meses o paciente apresentava risco baixo para o desenvolvimento de UP.* ***Conclusão:*** *Apesar das dificuldades encontradas durante o procedimento, principalmente no posicionamento do braço e nas transferências de decúbito, os resultados deste estudo estão em consonância com os aspectos considerados importantes durante o atendimento.*

Palavras-chave*: Humanização da assistência. Atenção primária à saúde. Cuidados de saúde.*

Introduction

Patients with severe neurological disorders experience sensory changes and motor disorders that significantly impair their quality of life. The clinical features of central nervous system disorders are determined by the location and extension of the lesion (1, 2). Health care providers play an important role in helping patients prevent sequelae, regain functionality and improve their quality of life. Nevertheless, professionals need to see beyond the clinical aspects of the neurological disease and view the patient holistically. Ideal health care services focus on patient wellbeing and quality of care. Caring means treating patients taking into account their social, economic and family backgrounds. Health care providers need to habe a comprehensive view, in order to provide a care that goes beyond the disease (3).

Physical therapy is a science that uses therapeutic techniques and interventions to promote the recovery of functionality, the prevention of sequelae and the improvement of patients' quality of life. Thus, physical therapists also participate in the ongoing process of transformation of the Brazilian and world health care systems. The inclusion of physical therapists in the multidisciplinary team was enacted by the 1988 Constitution. In face of pathological situations and conditions, these professionals are expected to think and act in a systematic, global way, interacting with other health professionals in order to prevent, minimize and/or reverse the changes resulting from neurological disorders and prolonged stay in bed. The increasing awareness about the importance of physical therapy assessment is accompanied by need to acquire increasingly complex knowledge, based on a holistic assessment of the patient, in order to correctly identify his/her problems and needs and make early intervention possible (4).

In this sense, although the importance of preventive actions in physical therapy has been stressed in the literature for some decades, particularly in England and Australia — for example, with the socallled Community Physiotherapy, whose goal is to prevent and control chronic diseases, and promote of

quality of life, especially in individuals with multiple health problems (5, 6) — these actions are only now obtaining a growing importance in current physical therapy practices. It is tool for practice at various levels of health care, especially in primary care. More than recovering or healing people, prevention creates opportunities for health and wellbeing. Preventive therapy aims to prevent or delay morbidities in chronic bedridden patients, promote the recovery of functionality lost as a result of the disease and/or sequelae which make people more susceptible to developing pressure ulcers (7). Thus, physical therapy treatment should begin early and last during the whole duration of the immobilization period.

The literature indicates that prolonged immobilization results in multiple skin, joint and muscle changes. The adverse effects of immobilization are numerous and include reduced functional capacity of the musculoskeletal, cardiovascular, cutaneous, respiratory, genitourinary, nervous, gastrointestinal, metabolic and hormonal systems. These changes occur slowly and are easily observed in bedridden patients (7). Decubitus ulcer formation is also significant due to trophic changes common to neurological diseases.

Bedridden individuals require home care. Multidisciplinary, comprehensive home care is one of the several activities implemented in primary health care. It should be structured taking into account: the clinical condition of the patient; the degree of dependence to perform functional activities; social and economic conditions; necessary equipment; and the involvement of caregivers in the program. The goal is to provide humanized and comprehensive care by means of a closer relationship between the health care team and the patient and his/her family. According to the World Health Organization, home care should "meet the care needs of people who are (temporarily or permanently) unable to seek health services outside the home". All members of the health care team should be involved in its implementation, as its effectiveness is associated with its composition and the conditions provided by the patient, his/her family and home "(8). It is of paramount importance that the work of health care providers in home care produce significant changes in the environment where patients live. Working in partnership with the team, with the own family and/or with caregivers is essential for the provision of quality care (9).

Therefore, an adequate recovery and prevention program should be planned and implemented using a multidisciplinary, participatory team approach. In addition, the team should be trained for this purpose. Another important element is the establishment of a closer relationship between the professional and the patient. This relationship "tends to be long-lasting and will inevitably be not limited to a relationship in which the physical therapist will restrict his\her actions to the technical performance of his/her tasks" (9).

Thus, the first goal of this study was to investigate the impact of a multiprofessional preventive care program based on the Pressure Ulcer Prevention Protocol of the University of Sao Paulo on internal and external risk factors for the development of stage 1, 2, 3 and 4 pressure ulcers. We used the Braden Scale to assess PU risk of patients.

The second goal of this study was to investigate the effectiveness of a care program based on the Bobath's concept in decreasing shoulder spasticity and facilitating movement. We worked with static postures in order to inhibit muscle tone changes and abnormal movement patterns. We assessed spasticity of the paralyzed arm using the modified Ashworth Scale.

Materials and Methods

Case report

We report the case of an 18-year-old male, who weighed 180 kg and was diagnosed with pituitary adenoma. The patient underwent surgery to remove a tumor in the central nervous system in September, 2009. Due to its location and the degree of involvement of brain tissue, only the part of the tumor that located between the optic nerve and the pituitary gland was removed. Pituitary tumors are benign tumors of the pituitary gland that typically cause neurological and hormonal symptoms. Our patient had acromegaly, which is caused by an over-production of growth hormone (GH).

The patient was discharged after nine days of hospitalization. At home he was diagnosed with deep vein thrombosis (DVT) in the left leg. The patient had swelling, edema and pain in the lower limbs. The literature states that neurological conditions that lead to prolonged bed rest, associated with obesity and post-surgical stress, are risk factors for the appearance of DVT (10).

The patient's main complaint was "persistent and intense" pain on the left shoulder. Pain was assessed

using a Visual Numeric Scale (VNS) and was found to have an intensity of 9 at baseline and of 6 after six months of treatment. First we performed an overall assessment of the patient, in order to check for the presence or absence of erythema in any body area, functional changes and sensitivity. On examination, the patient had no redness, blisters or ulcers in any part of the body.

The patient showed (table 1) spasticity in the left arm, change in muscle strength (table 2), and compromised motor function and performance. Muscle strength was assessed using the Manual Muscle Test (MMT), which allows the establishment of a functional diagnosis. Spasticity was assessed using the modified Ashworth Scale.

Other signs and symptoms presented by the patient included: headache; postural hypotension; changes in sensitivity to heat, cold and pressure; constant drowsiness; and difficulty speaking and swallowing. In the first month of treatment, the patient developed stage 1 and 2 PU. We used definitions of the National Pressure Ulcer Advisory Panel (NPUAP) on the staging of PU and performed a two-dimensional measurement (length x width) of shallow ulcers (stages 1 and 2). Ulcer length and width were measured with a ruler.

Measures to prevent the development of pressure ulcers were taken by the physical therapy, nursing and nutrition teams during six months. The Braden Scale was the assessment tool used in this study. The Braden Scale was validated in Portugal (11) and has six subscales: sensory perception, moisture, activity, mobility, nutrition, and friction/shear. Possible scores range from 6 to 20. Each subscale has a score ranging from 1 to 4, except for the subscale friction/shear. The total score (between 6 and 20) will predict a patient's risk of developing pressure ulcer and guide the selection of the necessary preventive measures. Adult patients with a score equal to or below 16 are considered at risk (12).

Prevention is the best solution to the problem of pressure ulcers. Thus, the Pressure Ulcer Prevention Protocol of the University of Sao Paulo (13) was of great healp in the implementation of preventive measures. The following prevention actions were taken with the help of caregivers and family members: use of pillows and cushions to reposition and elevate the patient's heels and other bony prominences; performance of transferring and positioning techniques (decubitus changes) at least every two hours.

The patient's body was placed in to proper postural alignment, and we paid special attention to the uniform and even distribution of the patient's weight, in order to avoid mechanical loading and relieve pressure on several points of his body. The patient and his caregivers were instructed about adequate skin care, hygiene, nutrition and hydration; inadequate postures; the importance of an adequate mattress; and the need to perform circulatory massage movements close to areas of redness for at least ten minutes, in order to stimulate local blood flow. Additionally, they were

Table 1 - Classification of patient's risk of developing pressure ulcers

Risk	Punctuation scores	Scores
High risk	1	between 6 and 11
Higher moderate risk	2	between 12 and 14
Lower moderate risk	2	between 15 and 17
Low risk	3	between 18 and 19
Extremely low risk	4	20

Note: The lower the score, the greater the potential for developing a pressure ulcer. © Copyright Bárbara Braden & Nancy Bergstrom, 1986. Validated in Portuguese by Paranhos WY; Santos, VLCG. (1999).

Table 2 - Scores obtained during the six months of treatment.

From September, 2009 until February, 2010.	Sensory perception	Moisture	Activity	Mobility	Nutrition	Friction/ shear	Total score
1st and 2nd Months	2	2	1	2	2	1	10
3rd and 4th Months	3	3	2	2	2	2	14
5th and 6th Months	3	4	3	3	3	2	18

Note: The lower the score, the greater the potential for developing a pressure ulcer. © Copyright Bárbara Braden & Nancy Bergstrom, 1986. Validated in Portuguese by Paranhos WY; Santos, VLCG. (1999).

instructed to elevate the headboard twice daily for 15 minutes and use supporting surfaces during skin care.

Low-power He-Ne laser was used in areas of bony prominences that were under pressure. We used laser irradiation at 4 J/cm^2 fluence for 4 minutes and in a punctual manner.

Modified Ashworth Scale

We assessed spasticity of the paralyzed arm using the modified Ashworth Scale (14). Spasticity are accompanied by secondary changes that can lead to deformities, such as muscle contractures, and aggravating factors, such as pressure ulcers. This disorder is seen in various diseases, among which the most frequent are cerebral palsy, spinal cord injury and brain injury, caused by trauma, tumor, vascular lesion, infection or degenerative diseases.

It is important to remember that bedridden patients suffer from neurological pain and paresthesia. If the pain is unbearable, the patient will have difficulties resuming independence in the performance of activities of daily living. Rigidity and spasticity can result in a dislocated shoulder. Recovery occurs if the motor control is activated by actions mediated by the "normal postural reflex mechanism", in accordance with Berta Bobath's classification (1980). The postural reflex mechanism is the product of the interaction between balance and rectification reactions. The activation of this mechanism means acquisition of motor control and, consequently, acquisition of movement (15).

A neurological and functional exercise program was also performed, according to the basic guidelines of the Bobath's concept (15). The exercises were performed in the patient's home, three times a week, for a period of six months (from September, 2009 to February, 2010). Each session lasted ninety minutes and a total of 62 sessions were conducted. Reassessments were carried out after 28 sessions and at the end of the intervention period.

Exercise Program

We performed exercises to achieve biomechanical alignment of the shoulder and scapula, and normalize muscle tone, positioning the arm out of the pathological pattern. Functional postures were adopted in order to facilitate ADL: patient supine with his arm elevated in the supine position for 10 minutes, and patient in the lateral decubitus position (lying on the unaffected side) with the affected arm resting on a pillow. The exercises were also carried out with the patient in a sitting position. The patient had to support the weight of his affected arm for 10 minutes. The program also included passive shoulder-stretching exercises, using key points of the Bobath's concept (shoulder external rotation, elbow extension and wrist extension) to inhibit hypertonia and prevent subluxation.

The program also included head and trunk extension exercises, and bridge exercises to strengthen the hip and trunk muscles. During performance of these exercises, the patient was supine, with his feet flat on the bed and his knees bent. He was told to contract the abdominal muscles, buttocks and posterior thigh in order to raise the pelvis. After thirteen sessions, movements of opening and closing of the arms and touching the shoulders, and lifting and supporting the shoulder (both with the patient in the sitting position) were added to the exercise program.

The following procedures were performed in the lower limbs: calf muscle pump (maneuver of manual compression of the calf) to reduce venous stasis and the risk of thrombosis, especially in the right leg; stretching exercises of the posterior thigh and leg muscles with the aid of an elastic band; knee and hip flexion and extension exercises, with the patient supine; and leg elevation exercises using a triangle support, in order to stimulate blood circulation.

This study was approved by the Research Ethics Committee (Opinion 0055/10). The patient and his family agreed to participate in the study. Parents and caregivers were briefed about the goals of this study and their rights as participants.

Results

After six months of intervention, there was a slight improvement in trunk control and spasticity of the left shoulder. The performance of exercises for the inhibition of pathological reflexes and facilitation of functional movements helped prevent contractures in the paralyzed arm and decrease hypertonicity.

According to the modified Ashworth scale (14) — which is used to assess the intensity of spasticity and its influence on the ability to perform passive and

active movements — the patient had grade 2 spasticity at baseline. This indicates a marked increase in muscle tone over most of the range of motion (ROM), although the patient was able to move his shoulder without much difficulty. After thirteen consecutive sessions, the patient exhibited reduced hypertonicity (grade 1+), which indicates a slight increase in muscle tone, manifested by a catch and release or by minimal resistance at the middle of the range of motion.

At baseline (September/October, 2009), the patient was at high risk for developing pressure ulcers, i.e., he had a score of 10. After 28 sessions, the patient had a score of 14, which indicates moderate risk of developing PU. When assessed with the Braden Scale, the patient showed mild improvement of tissue tolerance to pressure, shear and friction (as well as improvement in other subscales). In the following months, although the patient remained bedridden and had limited mobility because of DVT and his high weight, decubitus changes and proper positioning in bed, together with proper nutrition, were factors that contributed to the achievement of a score of 18 and the prevention of stage 1 and 2 pressure ulcer development. Importantly, stage 1 and 2 PU are extremely frequent in patients who are bedridden for prolonged periods. Immobility is the most common risk factor for the emergence of ulcers, especially in bedridden and obese patients, as changing positions in bed can be an extremely difficult task for these patients.

As shown in the table, after six months of intervention, the patient achieved a score of 18, which reflects low-risk for pressure ulcers. There was an improvement in blood perfusion and systemic oxygenation of the affected areas (heel, sacrum and buttock), due to decubitus changes and proper positioning in bed.

Most erythemas were found in the sacral (33.5%), calcaneal (22.6%) and gluteal regions (43.9%). 89% of the lesions were stage 1 ulcers and 11% were stage 2 pressure ulcers. No stage 3 or 4 PU were detected. None of the lesions had an area greater than 5 cm. Low-power He-Ne laser was used in areas of bony prominences that were under pressure. We used laser irradiation at 4 J / cm^2 fluence for 4 minutes and in a punctual manner. According to the literature (16), laser therapy is extremely important because it contributes positively to the reduction of erythemas that do not whiten, as well as to the wound healing process. Nussbaum and colleagues had already used this treatment technique in the 1990s and proven its effectiveness in the treatment of pressure ulcers in patients with spinal cord injuries (17).

Discussion

Preventive physical therapy for pressure ulcer

Caring for patients at risk of developing pressure ulcers still constitutes an important problem in the health care process. According to the National Pressure Ulcer Advisory Panel (NPUAP), pressure ulcers can be defined as "an area of localized damage to the skin and/or underlying tissue, usually over a bony prominence, caused by pressure, shear, friction and/or a combination of these". PU are classified by the depth and extension of tissue damage from stage 1 to stage 4, and are extremely frequent in patients who are bedridden for long periods of time (18).

Thus, it is important to determine which procedures and decisions should be taken for the early identification of individuals at risk of developing pressure ulcers. What procedures should be used to identify skin changes? Given the serious consequences of ulcers both to the patient and his family, it is important that health professionals implement measures to prevent these sores (19). A good prevention measure presupposes the knowledge of the etiology of the patient's medical condition and of his reality (20). Therefore, it is important to assess the stage of the ulcer. Moreover, the location, extension and depth of the lesion, as well as the condition of the skin (dryness, humidity), the sensitivity, and the level of consciousness and functional activity of the patient should also be assessed.

Acting against the negative effects of immobility on bedridden patients (at home or in the hospital), physical therapy contributes to the reduction of complications and sequelae. It is important to remember that treatment is multidisciplinary, in order to promote control of the clinical condition, maintenance of good nutrition and hygiene, proper positioning in bed, pressure relief and quality of life (13). User embracement is a determining factor in patient adherence to treatment. A humanized and holistic approach can lower barriers to help seeking and reduce the suffering of the patient and his family from the first contact with the staff.

Therefore, the first step for the implementation of preventive measures is the assessment of the patient risk of developing ulcers. Further details of the disease and the role of the multidisciplinary team should be discussed in the first meeting. Physical therapists play and important role in this process. The following preventive measures were taken during treatment to reduce the risk impact: use of pillows and cushions to reposition and elevate the patient's heels and other bony prominences; performance of transferring and positioning techniques (decubitus changes) at least every two hours; use of an adequate mattress in order to reduce pressure; good postural alignment; proper weight distribution; maintenance of the level of movement and funcional activity, mobility and range of motion; inspection of skin folds; monitoring of changes in the health status of the patient (13).

The Braden Scale serves an important reference for physical therapy interventions and for the understanding of risk factors. The scale allows assessing the progress of preventive measures with regard to sensory perception, moisture, activity, mobility, nutrition and friction/shear (21).

It is important to highlight that multiple factors can contribute to the development of pressure ulcers in patients who are bedridden for long periods of time. Epidemiological studies provide a better understanding of the risk factors associated with pressure ulcers. Considerable efforts have been made to establish guidelines for the prevention of pressure ulcers (22 - 24). Some studies have drawn attention to the importance of educational interventions. Professionals must be well informed and prepared in order to provide competent, quality care to patients. The lack of knowledge contributes to the maintenance of the situation. "The prevention of pressure ulcer development requires a better understanding on part of professionals of all the aspects involved in its development, as well as the adoption of ethical attitudes in care delivery, following recommendations and searching for adequate resources" (25).

Preventive physical therapy for shoulder pain

In addition to the risk of developing pressure ulcers, bedridden patients may experience neurological sequelae, such as motor paresis or plegia of a limb or hemibody, which impair mobility and restrict them even further to bed. According to Roper (26) apud Davies, pain in the paralyzed shoulder constitutes an important limitation for any rehabilitation program. Patients who have pain when moving they body will always try to remain still. If the pain is unbearable at rest, patients will have difficulty participating in any active rehabilitation program and resuming independence in activities of daily life because the pain and stiffness interfere with the performance of arm movements. Absolute immobilization of a segment leads to weakness and muscle atrophy due to disuse, as well as muscle contractures, decreased bone mass and joint degeneration. Shoulder pain hampers motor recovery, decubitus changes and postural transfers (27). These conditions justify the performance of early physical therapy interventions.

Hayes and Sullivan (28) identified a higher incidence of upper limb involvement. These authors have found high rates of shoulder subluxation in patients with hemiplegia, especially in the flaccid phase. Muscle weakness due to the absence of the motor control results in the appearance of lesions, such as the ones resulting from the stretching of its structures (29).

The clinical picture is characterized by pain and progressive loss of range of motion due to shoulder misalignment mechanisms, with loss of the shoulder locking mechanism, immobility and improper positioning of the affected arm. Functional recovery is a major challenge due to the complexity of the lost functions. Many physical therapy strategies can be used throughout treatment to prevent pain in the paralyzed shoulder. These include: proper positioning of the torso and shoulder on the bed, and the use of pillows for positioning the paralyzed arm (30). The first important action is to establish an anti-pattern positioning: the patient is supine, has his legs extended, and there is only a small pillow roll in the popliteal region. In addition, the upper limb is kept in maximum possible abduction with external rotation, supination, and extension of the wrist and fingers.

Shoulder pain may be related to several factors, including spasticity and limited range of motion. According to literature, if the pain in the shoulder is already established, recovery is very difficult (31 - 33). Therefore, early intervention is very important in order to prevent complications such as subluxated shoulder. According to Davies, subluxated shoulders are extremely vulnerable and can easily suffer trauma. It is known that the shoulder joint requires a large range of motion in order to allow delicate and

selective manipulations to be performed by the hand and the fingers. In the case of hemiplegia, the upper limb becomes more hypertonic, favoring traction of the scapula and resistance to correction (28).

To decrease spasticity, gain range of motion and prevent shoulder subluxation, we followed Davies's guidelines. The first goal of this treatment was to restore the normal locking mechanism of the shoulder by correcting the positioning of the scapula, because the trauma may be less painful if the scapula remains mobile. A second goal was to inscrease stability of the muscles around the shoulder, through joint mobilization. The more stable the muscles, the better the scapula will be positioned. Finally, a third goal was to maintain the full range of motion without injuring the structures that surround the shoulder (15, 28).

Final Considerations

In conclusion, immobiliyationn can cause significant and permanent changes to the patient's body. The results of this study reveal the need for the implementation of preventive actions in the care of bedridden, neurological patients. Nothwithstanding the difficulties experienced during treatment, especially for the positioning of the arm and performance of transferring and positioning techniques, the results of this study are in agreement with aspects considered important in treatment outcome. Early treatment, proper positioning of the paralyzed arm according to the Bobath's concept, proper handling of the patient (especially during the performance of transferring and positioning techniques) according to the Pressure Ulcer Prevention Protocol of the University of Sao Paulo were essential for the success of the treatment. The absence of (stages 3 and 4) pressure ulcers and neurological sequelae (such as shoulder subluxation) throughout the intervention by the multidisciplinary team serve as an indicator of the quality of care provided by both the caregiver and the health care team.

The complexity of the process of caring for bedridden patients at home demands a new approach by health professionals and especially by physical therapists. An approach that focus on prevention and health promotion. Preventive therapy is playing a growing role in physical therapy. It is tool for practice at various levels of health care (primary, secondary or tertiary) and provides conditions for the health and wellbeing of patients. Physical therapists play an essential role in the identifion, analysis and delivery of the necessary care to restore physical and physiological balance, decreasing the likelihood of development of musculoskeletal, postural and respiratory disorders, and pressure ulcers. The goal of home care to bedridden patients should be to provide humanized and comprehensive care by means of a closer relationship between the health care team and the patient and his/her family. Regaining functionality, preventing sequelae and improving patients' quality of life should be the main goals of any health care provider involved in the care of bedridden patients.

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References

1. Thomson A, Skinner A, Piercy J. Fisioterapia de Tidy. 12ª ed. São Paulo: Santos; 2002.
2. Levy JÁ, Oliveira ASB. Reabilitação em doenças neurológicas. Guia terapêutico prático. São Paulo: Atheneu; 2003.
3. Mattos R. Os sentidos da integralidade: algumas reflexões acerca de valores que merecem ser defendidos. In: Pinheiro R, Mattos RA, Orgs. Os sentidos da integralidade na atenção e no cuidado à saúde. IMS/Uerj/ABRASCO. 2001.39-64.
4. CNE. Diretrizes Curriculares Nacionais do Curso de Graduação em Fisioterapia, Resolução CNE/CES, de19 de fevereiro de 2002. [Cited in 2011 Ago. 20]. Available from: http://portal.mec.gov.br/cne/arquivos/pdf/CES042002.pdf.
5. Byrne NM, Hardy L. Community physiotherapy for children with cystic fibrosis: a Family satisfaction survey. Journal of Cystic Fibrosis. 2005;4(2):123-7.
6. Shaw IF. Preventive Physiotherapy in industry. Aust. J. Physiother. 1976;22(1):27-31.
7. Deliberato PCP. Fisioterapia preventiva: fundamentos e aplicações. São Paulo: Manole; 2002.

8. Brasil. Ministério da Saúde. Grupo Hospitalar Conceição. Manual de assistência domiciliar na atenção primária à saúde. Lopes, JMC (Org.). Porto Alegre: 2003. [Cited in 2015 Jun. 16]. Available from: : http://bvsms.saude.gov.br/bvs/publicacoes/Manual_Cuidadores_Profissionais.pdf.

9. Freitas MS. A fisioterapia na atenção primária à saúde em Juiz de Fora. In Barros, FBM, Org. O fisioterapeuta na saúde da população: Atuação transformadora. Série Fisioterapia e Sociedade. Rio de Janeiro: Fisiobrasil; 2002. 17-27.

10. Melo REVA, Silva CO, Silva LO, Melo MMVA, Lins EM. Trombose Venosa Profunda. Intern Journal of Dentistry. Abr/Jun. 2006;1(2):73-9.

11. Paranhos WY, Santos, VLCG. Avaliação de risco para úlceras de pressão por meio da Escala de Braden, na língua portuguesa. Rev da Esc Enferma USP. 1999;33:191-204.

12. Braden B, Bergstrom N. A conceptual schema for the study of the etiology of pressure sores. Rehab Nurs. 1987;12(1):8-16.

13. Caliri MHL. Protocolo de ensino para prevenção e tratamento de úlcera de pressão. Projeto Úlcera/USP [Cited in Jun. 14, 2015]. Available from: http://www2.eerp.usp.br/site/grupos/feridascronicas/index.php.

14. Projeto Diretrizes. Associação Médica Brasileira e Conselho Federal de Medicina. Espasticidade: Avaliação Clínica, 2006. [Cited in Jun. 15, 2015]. Available from: http://www.projetodiretrizes.org.br/5_volume/18-Espasticid.pdf.

15. Bobath B, Bobath K. Desenvolvimento motor dos diferentes tipos de paralisia cerebral. São Paulo: Manole; 1978.

16. Siqueira FCHN *et al*., Uso do laser de baixa intensidade AsALGa, 830nm, em pacientes portadores de úlceras de pressão. Reabilitar. 2004;6(23):10-15.

17. Nussbaum EL, Blemann I, Mustard B. Comparison of Ultrasound/Ultraviolet-C and Laser for Treatment of Pressure Ulcers in Patients With Spinal Cord Injury. Physical Therapy. 1994;74(9):21-32.

18. EPUAP & NPUAP. Guia Internacional. Prevenção das Úlceras por Pressão: Guia de Referência Rápida. 2009. [Cited in Jun. 15, 2015]. Available from: http://www.npuap.org/pr2.htm/http://www.npuap.org/resources/educational-and-clinical-resources/pressure-ulcer-categorystaging-illustrations/

19. Diccini S, Camaduro C, Senyer LI. Incidência de úlcera por pressão em pacientes neurocirúrgicos de hospital universitário. Acta Paul Enferm. 2009;22(2):205-9.

20. Blanes L *et al*. Avaliação clínica e epidemiológica das úlceras por pressão em pacientes internados no hospital São Paulo. Rev. Assoc. Méd. Bras. 2004;50(2):42-9.

21. Braden, B *et al.* Predicting pressure ulcer risk. A multisite study of the predictive validy of the braden scale. Nursing Research. 1998;47(5):261-9.

22. Rogenski NMB, Santos VLCG. Estudo sobre prevalência e a incidência de úlceras de pressão em um hospital universitário. Rev. Latino-Am. Enfermagem. July/Aug. 2005;13(4): 474-80.

23. Keller BP, Wille J, Van Ramshort B, Van Der Werken C. Pressure ulcers in intensive care patients: a review of risks and prevention. Intensive Care Med. 2002; 28(10):1379-88.

24. NHS Quality Improvement Scotland. Best practice Statement - Pressure ulcer prevention, november 2005. [Cited in Jun. 19, 2015]. Available from: http://www.thinkpressurecare.co.uk/media/8766/puprevman_bps_mar09.pdf.

25. Fernandes LM, Caliri MHL, Haas VJ. Efeito de intervenções educativas no conhecimento dos profissionais de enfermagem sobre prevenção de úlceras pressão. Acta Paul Enferm. 2008;21(2):305-11.

26. Roper BA. Rehabilitation after a stroke. J Bone Joint Surg. 1982;64-B(2):156-63.

27. Davies PM. Passos a seguir. São Paulo: Manole; 1996.

28. Hayes KW, Sullivan JE. Reliability of a new device used to measure shoulder subluxation. Phys Ther. 1989; 69(9):762-7.

29. Horn AI, Fontes SV, Carvalho SMR, Silvaldo RAB, Barbosa PMK, Durijan JRA et al. O complexo articular do ombro na hemiplegia. Rev Fisiot Univ São Paulo. 2003;3(1/2):14-27.

30. Bachir LA, Baraldi I. A influência do alinhamento do tronco na melhora do ombro doloroso do hemiplégico [case study]. Reabilitar, 2002;14:28-37.

31. Klotz T *et al*. Tratamento fisioterapêutico do ombro doloroso de pacientes hemiplégicos por acidente vascular encefálico: revisão da literatura. Acta Fisiatr. 2006;13(1):12-6.

32. Braun RM et al. Surgical treatment of the painful shoulder contracture in the stroke patient. J Bone Joint Surg. 1971;53-A (7):1307-12.

33. Oliveira e Silva C, Riberto M, Battistella LR. Avaliação da dor no ombro em paciente com acidente vascular cerebral. Acta Fisiátrica Journal 2000; 7(2):78-83.

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