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Content of Patient Education among
Fibromyalgia Syndrome Patients
Focus on Pain Management

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<p>The purpose of this final project was to describe the content of patient education for pain management among patients with fibromyalgia syndrome (FMS). Patient education is an opportunity to give information on how to improve health and it is essential in the management of chronic diseases like FMS. The ultimate goal was to improve nursing care for patients with FMS, promote knowledge and awareness about the condition and prepare health professionals to optimally support patients and their families, increasing patient satisfaction and compliance.</p> <p>This final project is in the form of a literature review. Four articles were obtained in CINAHL and MEDLINE databases and another 10 via manual search. The articles were analysed using content analysis and the findings categorized in three different groups.</p> <p>The content of the education for pain management includes information about the illness, consisting of personalized information about FMS, its symptoms and comorbidities, and information on self-management strategies such as regular exercise, relaxation methods and cognitive behavioural therapy. Also of importance are multimodal pain management methods, as FMS can rarely be treated using only a single method. All this content needs to be tailored to the specific needs of the patient and together with the patient. The research also highlights the fact that FMS is a hard to manage disease, with patients getting easily frustrated and unmotivated, and that nurses can significantly help patients by giving patient education.</p> <p>The results of this review give more insight on the content of the information to be provided, therefore helping the nursing community to improve the education and care given. The nursing community needs to recognize their important and vital role in the management of FMS, not only through educating patients about pain management and the management of other symptoms, but also by providing ways to support individual development and help motivate patients in the self-management of FMS.</p>	
Keywords	Fibromyalgia syndrome, pain management, patient education

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<p>Tämän lopputyön tarkoitus oli selvittää fibromyalgiasyndrooman (FMS) kivunhoitoon annettavan potilasohjauksen sisältöä. Potilasohjauksen tarkoituksena on luoda mahdollisuuksia terveydentilan parantamiselle, ja se onkin elintärkeä kroonisten sairauksien kuten FMS:n hoidossa. Työn pääasiallisena tavoitteena on tuoda terveydenhuoltoalan ammattilaisille tietoa hoitosuosituksista, parantaa tietoisuutta sairaudesta, sekä antaa heille välineitä potilaiden ja heidän lähipiirinsä tukemiseen, mikä puolestaan parantaa potilaiden tyytyväisyyttä ja sitoutumista hoitoon.</p> <p>Tämä lopputyö oli kirjallisuuskatsaus. Neljä artikkelia saatiin avainsanahauilla CINAHL- ja MEDLINE-tietokannoista, ja kymmenen muuta käsin. Artikkelien sisältö analysoitiin ja löydökset kategorisoitiin kolmeen eri ryhmään.</p> <p>Kivunhoidon ohjaus on pitkälti tiedonjakoa. Tämä sisältää potilaskohtaista informaatiota FMS:stä, sen oireista ja liitännäissairauksista ja tietoutta itsehoitostrategioista kuten säännöllisestä liikunnasta, rentoutumisharjoituksista ja kognitiivisbehavioraalisesta terapiasta. Lisäksi olennaisia ovat multimodaaliset kivunhoidon menetelmät, sillä FMS:ää hoidetaan harvoin vain yhdellä menetelmällä. Kaikki tämä tietous täytyy räätälöidä potilaan henkilökohtaisten tarpeiden mukaisiksi yhteistyössä potilaan kanssa. Kirjallisuudessa painotetaan lisäksi FMS:n hallinnan vaikeutta, ja sitä, miten potilaat usein turhautuvat helposti. Tässä sairaanhoitaja voi olla avuksi onnistuneen potilasohjauksen kautta.</p> <p>Kirjallisuuskatsauksen tulokset antavat lisätietoa potilaille tarpeellisen ohjauksen sisällöstä, mikä auttaa osaltaan parantamaan sairaanhoitajien antaman hoidon ja ohjauksen laatua. Tämän kautta hoitotyöntekijät voivat oppia paremmin ymmärtämään tärkeän roolinsa FMS:n hoidossa. Tähän kuuluu paitsi kivunhoidon ja oireiden tietouden levittäminen, myös yksilön tukeminen ja potilaiden motivoiminen FMS:n itsehoidossa.</p>	
Avainsanat	Fibromyalgiasyndrooma, potilasohjaus, kivunhoito

Table of contents

1	Introduction	1
2	Fibromyalgia syndrome	2
2.1	Prevalence	2
2.2	Symptoms and etiology	3
2.3	Diagnostics and treatment	4
3	Patient education and pain management	5
4	Purpose of the project, aim and study question	7
5	Data collection and analysis	7
5.1	Data collection	7
5.2	Data analysis	9
6	Results	9
6.1	Knowledge about the illness	9
6.2	Self-management techniques	10
6.3	Multidisciplinary programs	12
7	Discussion	13
7.1	Discussion of Results	13
7.2	Discussion of ethical issues	15
7.3	Discussion of validity	15
8	Conclusion and implications for nursing practice and research	16
	References	17
	Appendix 1	

1 Introduction

Fibromyalgia syndrome (FMS) is an illness characterized by chronic pain with trigger points, fatigue and non-restorative sleep disturbances (Call-Schmidt & Richardson 2003:124; Doğan, Aytur & Atbasoğlu 2011:1137). Incessant chronic pain leads to generalized hypersensitivity (Kindler, Bennett & Jones 2011:16; English 2012:2) and its existence is typically comorbid with maladies like depression, irritable bowel syndrome, joint pain, constipation and tension headaches, among others (Doğan, Aytur & Atbasoğlu, 2011:1137). The symptoms of FMS should not be seen as a single and isolated physical entity but as a condition that is affected by diverse mechanisms (Littlejohn & Walker 2002:286; Alamo, Moral & Pérula de Torres 2002: 23) distressing different parts of an individual's life (Littlejohn & Walker 2002:287; Arnstein 2004: 23) and decreasing the quality of life of the patient diagnosed (Friedberg 2010:642; Pfizer 2010). There is no curative treatment available and hence the management of FMS should be done in a multimodal form (Onieva-Zafra, Castro-Sánchez, Peñarrocha & Lorenzo 2010:4; Pfizer 2010) and can include pharmacological and non-pharmacological managements, like psychotherapy (Littlejohn & Walker 2002:287).

The patients affected by FMS often feel that little has been done to help them to cope with the disease (Arnstein 2004:35) because they cannot, most of the times, provide an explanatory reason for their symptoms, which leads to lack of credibility by the physicians and other health care professionals (Alamo, Moral and Pérula de Torres 2002:23; Friedberg & Jason 2001 in Friedberg 2010:641). It is usual for FMS patients to feel disbelieved, stigmatized and isolated and this facts lead ultimately to emotional distress and loss of social relationships (Newton et al. 2010:1-10) and to dissatisfaction with their medical consultations (Sylvain & Talbot, 2002:265; McKay, Duffy & Martin 2009:891). Sylvain and Talbot (2002:265) state moreover that this is the principal cause leading to high percentages of treatment resistance and non-compliance. Patients need therefore help to manage optimally the condition and the best way to help seems to be through providing patient education (Littlejohn & Walker 2002:286; Pfizer 2010:6). Patients also often need the nurse to advocate for them and to raise public awareness for the illness (Ware, Bruckenthal, Davis & O'Connor-Von 2009:26), to assist in the evaluation of their pain and experience of illness, and to inform and advise

about management forms based on evidence, helping the patient becoming an expert in the illness (Arnstein 2004:34).

The aim of this final project is therefore to identify the content of patient education focusing in pain management, in order to improve the care being currently given and consequently increase patient satisfaction and compliance. The ultimate goal of this project is to promote knowledge and awareness for FMS so that professionals can see this disease as a serious, true disorder and act with confidence to help the patient to improve their condition.

One last remark for the scope of this work: the alleviation of pain can happen pharmacologically or non-pharmacologically. Once the pharmacological treatment of pain is decided by medical doctors (although some nursing practitioners can prescribe medication) we will take into consideration the non-pharmacological approaches to pain management.

2 Fibromyalgia syndrome

2.1 Prevalence

FMS affects more women than men (Doğan, Aytur & Atbasoğlu 2010:1137, Taylor et al 2011:1-9), distressing mostly, middle aged population around the age of 40 (D'Arcy 2010:1; Doğan, Aytur & Atbasoğlu 2010:836), although it can be also encountered in young patients (Verkamp et al. 2012:2). The prevalence in the US is estimated at 2%-5% (Hammond & Freeman 2011:836; Pfizer 2010; Arnold et al. 2010:4); however, in the monography "Fibromyalgia Management" by Pfizer (2010:4) it is acknowledged that approximately two-thirds of the American population with the condition remain undiagnosed, especially men. In Europe, the latest figures show that 14 million people are affected, according to the European Network of Fibromyalgia association (ENFA). A study on the prevalence of fibromyalgia in 5 European countries (Branco et al. 2009:1-6) shows that in Western Europe the prevalence of FMS was of 2,9% or 6 million people. However, because of the limited geographical focus, the study does not provide a wide picture of the condition in Europe.

2.2 Symptoms and etiology

FMS is a chronic illness characterized by bilateral chronic widespread pain with generalized hypersensitivity (Kindler, Bennett & Jones 2011:26; McKay, Duffy & Martin 2009:885; Wolfe et al. 2010:600), especially to pressure pain (Shibley 2010:202, Wolfe et al 2010:600). The American College for Rheumatology's (ACR) provides as diagnosis criteria for FMS widespread pain existing for more than 3 months, both above and below the waist (Shibley 2010:202; Wolfe et al. 2010:600). The existence of chronic pain is typically comorbid with fatigue, anxiety, non-restorative sleep disturbances, memory loss, diffuse abdominal pain, irritable bowel syndrome and depression (Hammond & Freeman, 2006:835-846; Cöster et al. 2008:600; Shibley 2010:202; Call-Schmidt & Richardson 2003:124:133), decreasing the quality of life of the patient diagnosed (Lewandowski & Jacobson 2011). Some environmental circumstances have been associated with the exacerbation of the condition and among those are increased noise, bright lights, stress and changes in weather (Wassem, Beckham & Dudley 33:2001). Shibley (2010:202) provides a very important distinction between chronic widespread pain and FMS, affirming that FMS is a sub-group of the category of chronic widespread pain, but the later one does not cause allodynia when pressurizing the tender points. Cöster et al. (2008:601) corroborates this distinction and adds that chronic widespread pain is associated with less severe symptoms/consequences for daily life and that FMS is associated with higher pain severity.

FMS seems to have a strong genesis in several neurophysiologic disorders such as peripheral and central nervous system sensitization and impaired pain modulating systems (van Wilgen & Keizer 2012: 61-62; Aparicio et al. 2011; Kindler, Bennett & Jones 2011; English 2012:1) and neuroendocrine dysfunction (Aparicio et al. 2011). These factors cause hyperalgesia and hypersensitivity to touch and pressure (English 2012:1-2, Pfizer 2010: 8, Lewandowski & Jacobson 2011:2). Some other researchers categorize FMS as a psychological problem in the scope of affective disorders (Bohn, Bernardy, Wolfe & Häuser 2013; Fassbender et al 1997:77) once that there are no objective diagnosis criteria and that many of the symptoms and components overlap the ones attributed to emotional disorders and/or emotional abuse. English (2012:5) talks about a "cognitive-emotional sensitization" that is a state of constant self-awareness of pain sensation and a consequential hypersensitivity to pain. A more radical approach is defended by Ehrlich (2003:672), uttering that FMS is a 'meme disorder' leading to a medicalization of pain and being, in the end, a lucrative industry. He defends also that

FMS is purely a label given to patients with poor prognosis and with strong social and psychological maladjustments (2003: 672). In fact, FMS seems to be multifactorial in etiology, i.e., its presence is a gathering of physical and psychological malfunctions, although it seems that no one can pinpoint exactly which factors have a primary effect on the condition. The social context in which individuals experiencing chronic pain (Benedetti 2011:53, 54, 64; Sylvain & Talbot 2009:264-273) and the culture and ethnicity (Benedetti 2011:73; Siedlecki 2008:15) seem also to be of importance in perception of FMS. With so many areas being considered, it is obvious that the symptoms of FMS should not be seen as a single and isolated physical entity but as a condition that is affected by diverse mechanisms (Sommer et al. 2008:267-282; Wierwille 2010:185). Symptoms affect different parts of an individual's life (Littlejohn & Walker, 2002:286; Pfizer 2010) and require patient's self-management (Pfizer 2010:4).

2.3 Diagnostics and treatment

FMS differential diagnostics is done by performing a wide clinical examination and obtaining patient health history (Ablin et al. 2012:585-588; Wierwille 2010:186-87). Some auxiliary tests are used for aiding in the diagnostics and to assess the severity and impact of FMS in the individual's life, providing also a tracking tool for the progress of the illness. 'The Fibromyalgia Impact Questionnaire', stated in the study of Hammond and Freeman (2006:835) is one of them. Other include the Revised FMS Impact Questionnaire, the Modified Visual Analogue Scale of the FM Impact Questionnaire, the usual Numeric Rating Scales for pain (0-10) (Pfizer 2010:13) and the Mc-Gill Pain Questionnaire, either in short or long format (Onieva-Zafra, Castro-Sánchez, Peñarrocha & Lorenzo 2010:1; Ferreira, Ciampi de Andrade & Teixeira 2011). Wolfe et al. (2010:601) suggest as well that the lack of accuracy, especially when doing the 18 tender point count, leads to imprecision in diagnostics. These authors also state that the tender points count is fallible as many times people that no longer met the criteria of at least 11 tender points in 18 are not considered having FMS, although they still presented with habitual somatic symptoms. These facts contribute to underdiagnosed and undertreated cases (Pfizer 2010:4), increasing patient frustration and decreasing the individual's general well-being (van Wilgen & Keizer 2012:60).

FMS has no curative treatment. Among the palliative treatments one finds pharmacological methods such as general painkillers, muscle-relaxants, and tricyclic antidepressants like amitriptyline (Joshi, Joshi & Jain 2009:185-189; Goldenberg, Burckhardt & Crofford 2004:2388-2395), and non-pharmacological approaches (biopsycosocial) in-

cluding psychotherapy, patient education and exercise (Littlejohn and Walker 2002:289-290), and music therapy (Onieva-Zafra, Castro-Sánchez, Peñarrocha & Lorenzo 2010) among others. Cranial electrical stimulation was also proven to be of great benefit for the patients, decreasing fatigue, pain and sleep disturbances (Taylor et al. 2011).

Independently from the treatment chosen, and because FMS is multifactorial in etiology, the management of the condition should be done in a multimodal form (Onieva-Zafra, Castro-Sánchez, Peñarrocha & Lorenzo 2010:1; Luedtke et al. 2005:76; Vincent et al. 2011:1), combining pharmacological and non-pharmacological approaches (Shiple 2010:203; US Department of Human Health and Services 2009; Pfizer: 2010; Friedberg 2010:653; Häuser et al. 2008:4; Carville et al. 2008), possibly in a short term, in order to improve adherence of treatment (Luedtke 2005:79). Treatment must be matched to the patient, their symptoms and expectations (Shiple 2010:203; Wierwille 2010:189).

3 Patient education and pain management

Patient education is an opportunity to provide information to the patient/client and families in order to increase their knowledge (Wingard 2005:211) and it is done to promote health, prevent injury/illness, restore health and well-being and help the patient to engage in health promotion behaviours (DeLane & Laudner 2002:210; Wingard 2005:211-214). It ought to always be given by a credited and informed professional and be always patient centred and evidenced-based (Marten & Agruss 2005:436). By being informed about the condition and management strategies, the patient/client can acquire a sense of having gained control over the condition, becoming more satisfied with the care and acquire long-term skills and autonomy to manage the illness (Leino-Kilpi, Mäenpää & Katajisto 1999; Wingard 2005:211). Littlejohn and Walker (2002:286) have stated that patient education is the most powerful nursing intervention shaping attitudes, expectations and affecting the outcomes. The World Health Organization (1998:3) considers patient education as essential, especially in the management of chronic illnesses.

Patient education is part of the vast array of nursing interventions, which are defined by DeLaune and Laudner (2002:88) by an activity(ies) that a nurse will execute for and with the client in order to accomplish set goals and plans and set to enhance patient

outcomes (Berman, Snyder, Kozier & Erb 2008:223). Patient education, as an integrative part of nursing interventions, can include psychological, social or biological actions taking into consideration the preferences, cultural background and developmental level of the patient/client (Berman, Snyder, Kozier & Erb 2008:224; Wingard 2005:212). Because each patient's distress is exclusive (Cranford & King 2011:170), the education will not be efficient/beneficial all the patients equally (Wingard 2005:211). Therefore, the assessment, planning and implementation of patient education have to be well-designed, prioritizing the individual needs of the patient and meet the goals and objectives set (Wingard 2005:212).

Pain management is many times the goal of patient education. This means that in a day-to-day basis nurses engage in patient education activities in order to instruct the patient about evidence-based pain management. Those activities have an extensive range, and can be from explaining the reasons behind the prescription of a certain medication and its' effects and side-effects, to the teaching of strategies and programs directed to the management of the condition (Berman, Snyder, Kozier & Erb 2008:1224-1225). For example, the health care professional can instruct about non-pharmacological pain interventions and will therefore frequently provide information about techniques like distraction, prayer, mediation, quietness, being together, exercise, hydrotherapy, massage, cognitive behavioural therapy, among others (Hammond & Freeman 2005:836; Berman, Snyder, Kozier & Erb 2008:1202; Luedtcke et al. 2005:77). The patient education contents, in this example, focus mainly on strategies for improving the physical and cognitive aspects of the patient and on lifestyle changes (Berman, Snyder, Kozier & Erb 2008:1217).

It is important to instruct patients about their pain because, according to Berman, Snyder, Kozier and Erb (2008:1187), pain is an unpleasant experience, with physical, emotional and social consequences, interfering with quality of life of the person affected. It contributes towards many substantial health problems like insomnia, depressions, low self-esteem, tiredness, and memory problems, among others (Vincent et al. 2011:1). The fact that pain is a highly personal experience makes that different individuals feel pain differently because its meaning is inserted in a psychosocial context having therefore many factors playing a role in the experience of pain (Berman, Snyder, Kozier & Erb 2008:1189). Factors like ethical backgrounds, cultural values, social positions, developmental age, family or social support, among others, will interfere with the feeling and expression of pain (Berman, Snyder, Kozier & Erb 2008:1193-1196) and

they are essential if nurses want to give the best care in pain management. All pain management strategies shall be designed together with the patient, meeting both the individual needs and wishes of the patient (Berman, Snyder, Kozier & Erb 2008:1218), thus meaning that patient education too will be a highly personalized action and its methods and contents have to be tailored for the patient.

4 Purpose of the project, aim and study question

The purpose of this final project is to identify the content of patient education that is used among FMS patients by nurses. The research question to be answered by this literature review is:

What is the content of patient education for patients with FMS in relation to pain management?

The ultimate goal is to educate the health professionals on the current treatment guidelines, promote knowledge and awareness about the condition and, by these means, prepare the health professionals to support optimally patients and their families, increase patient satisfaction and compliance.

5 Data collection and analysis

This final project is in the form of a literature review. The aim of a literature review is to gather important, up-to-date and evidence-based knowledge about a certain condition and provide a wider perspective on the topic (Burns and Grove 2007:135). It is done by the recovering information about a certain topic and presenting a synthesis of what was found in order to either provide base for further research or to deliver evidence-based for a certain field of practice (LoBiondo-Wood and Haber, 2006:59).

5.1 Data collection

The material needed for this review was carefully searched in two internet-based databases: MEDLINE and CINAHL. The search terms were "fibromyalgia", "patient education" and "pain management". Only relevant studies, i.e. the ones that have a direct

bearing on the problem, from primary and current sources were used. Selection criteria for this review were set as follows:

1. The article is published between 2003 and 2013
2. The article is published in English
3. The article has relevance for nursing.

As seen in table 1, the total amount of hits in CINAHL was 7. Application of the limitations yielded 5 articles, of which 4 were considered after considering the title. After reading the abstract the results were cut to 3. From these 3 articles, only one was found in full text and therefore was the only article chosen for this literature review.

Table 1: results from the research in CINAHL (October 2013)

Search terms	Total	With limits	Chosen from title	Chosen from abstract	Chosen after reading article
fibromyalgia AND "patient education" AND "pain management"	7	5	4	3	1

As seen in table 2, the amount of articles retrieved in MEDLINE was of 25. Application of limitations yielded a total of 13 articles. Of them, 6 were chosen by title, 5 chosen after reading the abstracts. After careful reading and analyzing the texts in their totality, 4 articles were chosen to integrate this literature review. However, 1 article was the same article chosen in CINAHL and therefore the amount of final articles being included from MEDLINE search was of 3.

Table 2: results from MEDLINE (October 2013)

Search terms	Total	With limits	Chosen from title	Chosen from abstract	Chosen after reading article
fibromyalgia AND (patient education) AND (pain management)	25	13	6	5	4

The reference lists of the articles retrieved by electronic search were constantly checked for any interesting source and so additional 10 articles were found and included in this literature review. In total, 13 articles were considered (see Table 3 in appendix).

Literature reviews, controlled trials longitudinal, cohort studies, with good research methods and validity were included. Special attention was given to the fact that all the individuals present in the research had to meet the criteria for FMS, i.e., the study had to be done with FMS patients, and not with patients that had not being diagnosed or that meet criteria only for associated symptoms (e.g., chronic pain or fatigue).

5.2 Data analysis

The method used for the systematization and summarizing of the data was content analysis. According to Polit and Hungler (1995:195) it consists in the quantification of narrative material by means of finding categorizations for the material obtained. This means that the data found will be categorized and this will provide an answer for the question of the study.

The data were grouped in three different categories. Providing Knowledge about the illness was referred in many articles and is incorporated as the first category in this study. The second category included was about self-management techniques for pain management in FMS. Once the largest part of the articles described also the need for an integrated multidisciplinary approach for the management of FMS, a third category was added to the results about multidisciplinary programs for the management of pain and FMS.

6 Results

6.1 Knowledge about the illness

According to the findings, background information about FMS and its' management can improve the pain status as suggested by Hävermark and Langius-Eklöf (2006), Hassett and Gevirtz (2009:395), Mannerkorpi and Henriksson (2007:513-534), Hammond and Freeman (2006:839) and Goldenberg, Buckhardt and Crofford (2004:2388-2395). Hassett and Gevirtz (2009:395) go further stating that it is consensual that information

about the illness should be given but in a careful way, as it can worsen the symptoms. These authors affirm also that education seems to be more effective when being part of a multimodal program.

The information to be given varies with the needs of the patient, but it should cover subjects as the theoretical background of fibromyalgia and symptoms (Mannerkorpi & Henriksson 2007:526; Goldenberg, Buckhardt & Crofford 2004:2393; Hassett & Gevirtz 2002009:3), as well as comorbid diseases and stress management (Mannerkorpi & Henriksson 2007:526: Goldenberg, Buckhardt & Crofford 2004:2393) and also about the cycle of fibromyalgia symptoms perpetuation and how self-management approaches can help with the reduction of symptoms (Hammond & Freeman 2006:837). This background information can either be given to individuals and their families. The information should be personalized, encountering the patients educational needs and expectations and should be given when the patient feels ready (Mannerkorpi & Henriksson 2007: 526, 530).

6.2 Self-management techniques

The nurses can also provide education about self-management techniques for pain management. Exercises like aerobic exercise, strength training, and range of motion exercise are recommended by Hammond and Freeman (2008), Harden et al (2012), Mannerkorpi and Henriksson (2007:515) and Karper, Jannes and Hampton (2006:193). Hammond and Freeman (2008:837) described postural training, stretch and strengthening exercises as exercises to be used. Low impact exercise that does not produce any discomfort was endorsed by Karper, Jannes and Hampton (2006). Mannerkorpi and Henriksson (2007:515-524) list low to moderate and moderate to high intensity aerobic exercises that can be made for pain management in FMS. Among those exercises are cycling, dancing, whole-body exercise, pool exercise and walking (2007:515; 524-525). Hammond and Freeman (2006:837) reported still that the exercises should be easily reproduced in the patient's own environment with minimal cost.

T'ai Chi was endorsed by Hassett and Gevirtz (2009:400), Taggart, Arslanian, Bae and Singh (2003), and Hammond and Freeman (2008:837) as beneficial in improving the quality of life of patients and decrease pain. Mindfulness meditation together with Qiong Movement Therapy showed significant improvements in the pain, depression and disability rates in the study of Astin et al. (2003). However, these last researchers also found no significant improvement between this intervention group and their control

group receiving only education consisting in lectures about pain, stress, exercise, sleep, work and intimacy, among others (2003:2260). Aquatic therapy and poolside exercises were found useful activities for managing FMS in the studies by Evcik, Yigit, Pusak and Kavuncu (2008), Hassett and Gevirtz (2009:401) and McVeigh, McGaughy, Hall and Kane (2008). Therapeutic touch (Denison 2004) did have some influence on pain strength outcomes. Mud-bath was also proven to relieve pain and improve condition therapy (Fioravanti et al. 2007). This therapy consisted of mud packs between 40 and 45C applied to the body in the morning and thermal baths at 37-38C for 10 minutes (Fioravanti et al. 2007:1155). Auspicious results in recent studies on the use of heart rate variability feedback and electromyogram feedback for the management of FMS were reported by Hassett and Gevirtz (2009:398-399). Hammond and Freeman (2006:837) report also using other procedures as activity pacing, sleep hygiene and problem solving in the management of FMS.

Relaxation methods are also endorsed as self-management activities. For example, Hammond and Freeman (2006:837) include relaxation in form of deep breathing, visualization and proprioceptive neuromuscular facilitation method in their study and both Goldenberg, Buckhardt and Crofford (2004:2391) and Hassett and Gevirtz (2009:397-398) recommend relaxation as a way to decrease stress and improve management results. These last authors list progressive muscle relaxation, autogenic training, guided imagery and mediation as relaxation techniques that can be used in self-management (2009:397). Pain, fatigue and stress management, including managing negative automatic thoughts, were suggested by Hammond and Freeman (2006:837). Hävermark and Langius-Eklöf (2006:315) report that the educational-program they used also included teaching about relaxation techniques, thus providing more evidence for the usefulness of relaxation techniques for the management of FMS. The health care professional can also instruct about the utilization of wool bedding and underwear, as they were shown effective in decreasing pain (Kiyak 2009:399-405). Kiyak, (2009:403 has reported significant decrease in tender point count results that seem to be correlated with the increase of blood flow to the affected areas. Acupuncture and massage are mentioned both in the studies of Mannerkorpi and Henriksson (2007:528) and of Hassett and Gevirtz (2009:400). While the first states that there is no conclusive evidence about their effects in managing FMS, the second states that massage was found to be beneficial and highly appreciated by the patients, and that acupuncture is a promising technique but more studies are needed to confirm its efficacy.

Cognitive behavioural therapy (CBT) has been recommended by Goldenberg, Buckhardt and Crofford (2004:2392-2393) and Hassett and Gevirtz (2009:394) for patients in bigger psychological distress, with multiple symptoms and poor coping skills and/or less social support. In the therapy, issues like sleep hygiene, reduction of pain behaviours, catastrophizing, maladaptive thoughts and behavioural activation, among others, can be addressed improving mood, stress, pain and problem coping (Hassett & Gevirtz 2009:395-396).

One last consideration about teaching self-management activities for pain relief is that activities that require vigorous exercise from the patient should only be considered if the patient has no limitations to exercise and has some tolerance to pain (Mannerkorpi & Henriksson 2007:529). If the patient has more severe symptoms then less extenuous kinds of activity should be suggested. It is similarly important that nurses know where to direct the patients for the right resources once that nurses are not the professionals of choice for providing these services. The results also show that in patient education self-management and perseverance are important factors in the outcome. Hävermark and Langius-Eklöf (2006) found that individuals that keep on doing regular self-awareness could extract more benefits than the ones that did not (2006:318), and that self-motivation was a crucial factor on the management of the problem (2006:318).

6.3 Multidisciplinary programs

Goldenberg, Buckhardt and Crofford (2004:2393) affirm that FMS cannot be treated with only one method and several other authors indorse this opinion. Multidisciplinary or multimodal programs are important because once FMS has several symptoms then several approaches to the management of the illness should be considered. The health care professional needs to instruct the patient about the probability of having to engage in more than one management approach in order to decrease pain levels. Examples of multidisciplinary programs for the management of FMS and pain levels can be found on studies by Hammond and Freeman 2006) and Hävermark and Langius-Eklöf (2006) with similar results. The first study, that incorporates a myriad of exercises, education about condition and activities like activity pacing, stress management, sleep hygiene and relaxation techniques among others, shows that the multiprofessional intervention improved the patient's ability to manage pain and other symptoms, lowered levels of hopelessness and visits to the doctors and increased adherence to exercise when compared to the group only getting relaxation-related education (2006:839). The sec-

ond, incorporating training in warm water, stretching, BAT, relaxation and education about the illness shows that a multidisciplinary program can indeed help in some categories like well-being and pain. However, both studies agree on the fact that long-term benefits are not sustained (Hammond & Freeman 2006:844; Hävermark & Langius-Eklöf 2006:320) except for well-being indicators in the study of Hävermark and Langius-Eklöf (2006:320). Likewise Karper, Jannes and Hampton (2006:193-198) developed a multimodal approach to be tested that included aerobic exercise, strength training and range-of-motion gradually included along 5 years. The results show that psychosocial and physical function improved, maybe because the program was of long duration and gradual and of low impact. The authors recommend that exercise should be done 5 times a week in order to promote adherence (Hävermark & Langius-Eklöf 2006:197). Hassett and Gevirtz (2009:401) resume accurately the multidisciplinary approach for FMS by using the acronym ExPRESS:

“Ex for exercise, P is for psychiatric comorbidity, because depression and anxiety disorders are common (...) and contribute significantly for pain and disability, R is for regaining function (...) helping patients with activity pacing(...), E for education, in which simply informing a patient where on the internet he or she can find reliable information can be a good start. (...) S for sleep hygiene (...) and S for stress management.”

(Hassett & Gevirtz 2009:401-402)

7 Discussion

7.1 Discussion of Results

This literature review was set to give more insight on the possible contents of the FMS patient education for pain management by nurses. The findings suggest that there are several aspects a nurse can address while educating FMS patients about pain management. These results were in line with many studies and guidelines that address the importance of patient education for pain management in FMS (Shibley 2010:203; Pfizer: 2010; Friedberg 2010:653; Häuser et al. 2008:4; Carville et al. 2008). The literature showed that there are plenty of articles referring to the management of the disease; however, many of them were for the medical community and either focused on a single management technique or then were protocols for the treatment of the disease for medical doctors. Even if researches show that FMS affects a huge number of patients and that many patients remain undiagnosed or undertreated (Pfizer 2010:4; Lakormek, Lakormek & Bosquet-Nahrwold in Joshi, Joshi & Jain 2009:185), FMS seems to attract minor interest in the nursing community. This reflects the idea that FMS is not well

known and that nurses are probably not aware of their role in the treatment of the illness and in the influence they can have on the patients.

The results of this review highlight the importance of patient education and give more insight on the content of the information to be provided. The content of the education for pain management includes not only background information about the illness but also information on self-management strategies and on the importance of a multimodal approach. Indeed, recent several guidelines by the European League against Rheumatism (EULAR)(2007:536-541), the US Department of Health and Human Services (2009) and the Interdisciplinary evidence-based guideline proposed by Häuser et al. (2008) for the German medical community, among other sources, recommend that the treatment of FMS patients shall consist of family and patient education and that should include information about the illness, its prognosis and management techniques, like medication, CBT, physiotherapy and exercise, this giving legitimacy to the results of this review. The results obtained also validate the opinion of Marter and Agruss (2005:428-430) that informing the patient and including possibility for discussion about FMS and different management strategies, covering subjects like pain management, prognosis and importance of adherence to treatment, is the first-line recommendation for fibromyalgia patients.

FMS is not an easy condition to manage due to the heterogeneity of the symptoms and many patients get overwhelmed and frustrated easily, which is not supportive of a proper and effective pain management or for the management in general of the symptomology. It is a fact that in some studies (Taggart, Arslanian, Bae and Singh 2003:353-360; Denison 2004:142:151) both the small amount of subject and/or the high dropout rate make them be less reliable and effective. Since every patient experience is different, the patient education for pain management can be as broad and creative as needed with the aim of decreasing the state of pain. Whatever works for the patients and does not put at risk or deteriorate further their health is seen as feasible. Generalization, therefore, is something that health professionals cannot made when giving patient education for pain management for patients with FMS.

The multimodal management of pain seems to be the best solution for the pain management in FMS and this fact is proved by the amount of studies incorporating more than one approach for the management of pain, from which however only a few were chosen for this final project due to search limitations and /or because they were not

directed to the nursing community. Therefore it seems to be of importance that the health professionals inform the patients about the need to fight the status of pain in different fronts.

It is also apparent that the more FMS is studied the more insight is gained and thus the content of patient education for pain management will evolve. The majority of the articles chosen focus on a small number of subjects and therefore many of them made clear the need for further research at a larger scale and with longer follow-up periods and for different subgroups of patients like the elderly, the young, male patients and with different cultural backgrounds. (Mannerkorpi & Henriksson 2007:531; Kiyak 2008:404; Fioravanti et al. 2007:1160; Taggart, Arslanian, Bae & Singh 2003:358; McVeigh, McGaughey, Hall & Kane 2008:128; Hassett & Gevirtz 2009:402; Evcik, Yigit, Pusak & Kavuncu 2008:889).

7.2 Discussion of ethical issues

The studies were presented reliably and author credits were given as needed, providing therefore no fabrication, falsification or plagiarism to this work, and thus meeting the criteria for ethical research set by the Finnish Advisory Board on Research Integrity (2012). There are no conflicts of interest to report and this final project was performed by the author alone and it was carefully monitored by supervisors and further expert assistance, giving this work integrity and scientific value.

7.3 Discussion of validity

The databases used, CINAHL and MEDLINE, are well known, used, mentioned and recommended by several authors, like LoBiondo-Wood and Haber (2006:68-71), giving validity to the research performed. The criteria applied to the electronic search were also applied in the manual search and the articles retrieved were relevant to nursing practice. All articles retrieved belonged to respected, peer-reviewed journals. Only one person collected and analysed data which attributes consistency to the project.

8 Conclusion and implications for nursing practice and research

Although not always recognizable, nurses carry a huge accountability in patient education for pain management aimed at patients with FMS. The findings support that the content of patient education for the optimal management of pain should focus on information about the illness, about self-management measures and information about the need to approach the problem in several fronts. However, this insight does not provide any new information on the matter, as many studies and guidelines mention the contents found by this study. The role of informing the patient about the illness is well documented as well it is the fact that multimodal approaches need to be used. However, perhaps this work can bring some more insight on the content about self-management matters. In the study of Sylvain and Talbot (2002:269-270), it is affirmed that recognition of the experience of pain by the health professionals is needed, along with expertise and skills of those professionals to help the patients find their inner strength to deal with the illness. Indeed, many professionals tend to be quite sceptical about the aetiology and seriousness of the illness and perceive the management of the illness as time-consuming (Pfizer: 2010 4:2010) and see the FMS patients as difficult or heartsink, generating attitudes leading to deterioration of the clinical relationship (Alamo, Moral & Perúla de Torres 2002:23). These ideas have an effect on the patients, leading to patient frustration (Cranford and King 169:2011) and to the lack of concrete, practical measures to manage the condition (Wassem, Beckham and Dudley 2001:33, Pfizer: 2010 et al 4:2010).

Having this into consideration, the most important issues to be considered by the nursing community in relation to the contents of patient education for pain management are:

1. The contents of the patient education focus mainly on giving knowledge about the illness, about self-management techniques, like exercise, physiotherapy and alternative medicine methods and about multidisciplinary programs.
2. Personalized care is a must and the nurse shall plan the intervention carefully to meet the needs of the patient. Tailored education is the key to improve the patient's quality of life.
3. Health professionals need to recognize their important and vital role in treating this disease, especially in multimodal therapies, by educating the patient about the management of the disease and by being there for the patient.

References

Ablin, J., Buskila, D., Van Houdenhove, B., Luyten, P., Atzeni, F., Sarzi-Puttini, P. (2012). Is fibromyalgia a discrete entity?. *Autoimmunity Reviews*. 11 (8). 585-588.

Alamo, M., Moral, R.R. and Pérula de Torres, L.A. (2002). Evaluation of a patient-centered approach in generalized musculoskeletal chronic pain/fibromyalgia patients in primary care. *Patient Education Counselling*. 48 (1). 23-31.

Aparicio, V. A., Ortega, F.. B., Carbonell-Baeza, A.,Gatto-Cardia, C., Sjöström, M. Ruiz, J.M. and Delgado-Fernández, M.(2011). Fibromyalgia's Key Symptoms in Normal-Weight, Overweight, and Obese Female Patients. *Pain Management Nursing*, Vol - (--). 1-9. Article in press

Arnstein, P. (2004). Chronic Neuropathic Pain: Issues in Patient Education. *Pain Management Nursing*. 5 (4-1). 34-41

Astin, J., Berman, B., Bausell, B., Lee, W., Hochberg, M., and Forys, K. (2003). The efficacy of mindfulness meditation plus Qigong movement therapy in the treatment of fibromyalgia: a randomized controlled trial. *The Journal of Rheumatology*. 30 (10). 2257-2262

Benedetti, F. (2011). *The patient's brain – the neuroscience behind the doctor-patient relationship*. Oxford: Oxford University Press.

Berman, A., Snyder, S.J., Kozier, B., Erb, G. (2008). *Kozier and Erb's Fundamentals of Nursing*. New York: Pearson Education Inc.

Bohn, D., Bernardy, K., Wolfe, F. and Häuser, W. (2013). The association among childhood maltreatment, somatic symptom intensity, depression, and somatoform dissociative symptoms in patients with fibromyalgia syndrome: a single-centered cohort study. *Journal of Trauma Dissociation*. 14 (3). 342-58

Branco, J., Bannwarth, B., Failde, I., Carbonell, J., Blotman, F., Spaeth, M., Saraiva, F., Nacci, F., Thomas, E., Caubère, J.P., Lay, K., Taieb, C. and Matucci-Cerinic, M. (2009). Prevalence of Fibromyalgia: a survey in five European countries. Art. in press *Seminars in Arthritis and Rheumatism*. 1-6.

Burns, N. and Grove, S. (2003). *Understanding Nursing Research: building an evidence-based practice*. Missouri: Saunders Elsevier.

Call-Schmidt, T. A.; Richardson, S.J. (2003). Prevalence of Sleep Disturbance and its Relationship to Pain in Adults with Chronic Pain. *Pain Management Nursing*. 4 (3). 124-133

Carville, S.F., Arendt-Nielsen, S., Bliddal, H., Blotman, F., Branco, J.C., Buskila, D., Da Silva, J.A.P., Danneskiold-Samsøe, B., Dincer, F., Henriksson, C., Henriksson, K.G., Kosek, E., Longley, K., McCarthy, G.M., Perrot, S., Puszczewicz, M., Sarzi-Puttini, P., Silman, A., Späth, M. and Choy, E.H.(2008). EULAR evidence-based recommendations for the management of fibromyalgia syndrome. *Annals of the Rheumatic diseases*. 67. 536-541.

Cranford, C. and King, C. (2011). Nurse practitioner student's perceptions of fibromyalgia pain and quality of life. *Medical surgical nursing*. 20 (4).169-177.

Cöster, L., Kendall, S., Gerdle, B., Henriksson, C., Henriksson, K. and Bengtsson, A. (2007). Chronic widespread musculoskeletal pain – A comparison of those who meet criteria for fibromyalgia and those who not. *European Journal of pain*. 12. 600-610.

D'Arcy, Y. M. (2010) Women's Pain Management Issues, *Pain Management Nursing*, 12 (1). S1-S3

DeLaune, S.C.; Ladner, P.K. (2002). *Fundamentals of Nursing – Standards and Practice*. USA: Delmar Thomson Learning

Denison, B. (2004). Touch the pain away: new research on therapeutic touch and person with fibromyalgia syndrome. *Holistic nursing practice*. 18 (3). 142-151.

Doğan, S.K., Aytur, Y.K. and Atbasoğlu, C. (2010). Assessment of the relatives or spouses cohabiting with the fibromyalgia patients: is there a link regarding fibromyalgia symptoms, quality of life, general health and psychological status?. *Rheumatology International*. 31. 1137-1142.

English, B. (2012). Neural and Psychosocial mechanisms of pain sensitivity in Fibromyalgia. In print for *Pain Management Nursing*. 1-9.

Erhlich, G. E. (2003). Low back pain. *Bulletin of the World Health Organization*. 81. 671-676.

Evcik, D., Yigit, I., Pusak, H. and Kavuncu, V. (2008). Effectiveness of aquatic therapy in the treatment of fibromyalgia syndrome: a randomized controlled open study. *Rheumatology International*. 28. 885-890.

Fassbender, K., Samborsky, W. Kellner, M. Müller, W. and Lautenbacher, S. (1997). Tender points, Depressive and Functional Symptoms: comparison between Fibromyalgia and Major Depression. *Clinical Rheumatology*. 16 (1). 76-79.

Ferreira, K., Ciampi de Andrade, D. and Teixeira, M.J.(2011). Development and Validation of a Brazilian version of the Short-Form McGill Pain Questionnaire (SF-MPQ). *Pain Management Nursing*. Vol(-). 1-10. Article in press.

Fibromyalgia Management – A framework for fibromyalgia management for primary care physicians. (2010). *Monograph by Pfizer Inc*. 1-47.

Finnish Advisory Board on Research Integrity (2012). The responsible conduct of research. <<http://www.tenk.fi/en/responsible-conduct-research-guidelines/responsible-conduct-research>> Read on 10.11.2013

Fioravanti, A., Perpignano, G., Tirri, G., Cardinale, G., Gianniti, C., Lanza, C.E., Loi, A., Tirri, E., Sfriso, P. And Cozzi, F. (2007). Effects of mud-bath treatment on fibromyalgia patients: a randomized clinical trial. *Rheumatology international*. 27- 1157-1161.

Fortin, M., Choinard, M., Bouhali, T., Dubois, M., Gagnon, C., Bélanger, M. (2013). Evaluating the integration of chronic disease prevention and management services into primary health care. *BMC Health Services Research*, pp 1-13.

Friedberg, F. (2010). Chronic Fatigue Syndrome, Fibromyalgia, and Related illnesses: a clinical model of assessment and intervention. *Journal of Clinical Psychology*. 66 (6). 641-665.

Goldenberg, D., Burckhardt C., Crofford L. (2004). Management of Fibromyalgia Syndrome. *Journal of the American Medical Association*. 292(19). 2388-2395

Hammond, A. and Freeman, K. (2006). Community patient education and exercise for people with fibromyalgia: a parallel group randomized control trial. *Clinical rehabilitation*. 20. 835-846.

Hassett, A. and Gervitz, R.N. (2009). Nonpharmacologic treatment for fibromyalgia: patient education, cognitive-behavioral therapy, relaxation techniques, and complementary and alternative medicine. *Rheumatic Disease Clinics of North America*. 35. 393-407

Häuser W., Arnold, B., Eich, W., Felde, E., Flügge, C., Henningsen, P., Herrmann, M.m Köllner, V., Kühn, E., Nutzinger, D., Offenbächer, M., Schiltewolf, M., Sommer, C., Thieme, K and Kopp, I.(2008). Management of Fibromyalgia Syndrome-an Interdisciplinary evidence-based guideline. *GMS German Medical Science*. 6. 1-11

Häuser, W., Bernardy, K.,Arnold, B., Offenbächer, M. and Schiltewolf, M. (2009). Efficacy of Multicomponent treatment in Fibromyalgia Syndrome: a meta-analysis of randomized controlled clinical trials. *Arthritis & Rheumatism (Arthritis care and research)*.61 (2).216-224.

Hävermärk, A. and Langius-Eklöf, A. (2006). Long-term follow up of a physical therapy programme for patients with fibromyalgia syndrome. *Scandinavian Journal of Caring Science*. 20. 315-322.

Joshi MN, Joshi, R. and Jain AP. (2001). Effect of amitriptyline vs. physiotherapy in management of fibromyalgia syndrome: What predicts a clinical benefit?. *Journal of Postgraduate Medicine*, Vol 55 Issue 3

Karper, W., Jannes, C. and Hampton, J. (2006). Fibromyalgia Syndrome: The beneficial effects of exercise. *Rehabilitation Nursing*. 31(5). 193-198

Kindler, L., Bennett, R., and Jones, K. (2011). Central Sensitivity Syndromes: Mounting Pathophysiologic Evidence to Link Fibromyalgia with Other Common Chronic Pain Disorders. *Pain Management Nursing*.12 (1).15-24

Kiyak, E.K. (2009). A new nonpharmacological method in fibromyalgia: the use of wool. *The journal of alternative and complementary medicine*. 15(4). 399-405

Leino-Kilpi H., Mäenpää, I. and Katajisto J. (1999). Nursing study of the significance of rheumatoid arthritis as perceived by patients using the concept of empowerment. *Journal of Orthopaedic Nursing*. 3. 138–145

Lewandowski, W. and Jacobson, A. (2011). Bridging the Gap Between Mind and Body: A Biobehavioral Model of the Effects of Guided Imagery on Pain, Pain Disability, and Depression; *Pain Management Nursing*, Vol (--). 1-11. Article in press

Littlejohn, G., and Walker, J. (2002). A Realistic Approach to Managing Patients with Fibromyalgia. *Current Rheumatology Reports*. 4. 286–292

LoBiondo-Wood, G. and Haber, J. (2006). *Nursing research: methods and critical appraisal for evidence-based practice*. Missouri: Mosby Elsevier

Luedtke, C., Thompson, J., Postier, J., Neubauer, B., Drach, S. and Newell, L. (2005). A Description of a Brief Multidisciplinary Treatment Program for Fibromyalgia. *Pain Management Nursing*. 6 (2). 76-80

Mannerkorpi, K. and Henriksson, C. (2007). Non-pharmacological treatment of chronic widespread musculoskeletal pain. *Best Practice & Research Clinical rheumatology*. 21(3). S13-S34

Mannerkorpi, K., Ahlmén, M. and Ekdahl, C. (2002). Six- and 24-month follow-up of pool exercise therapy and education for patients with fibromyalgia. *Scandinavian Journal of Rheumatology*. 31(5). 306-10.

Marter, A. and Agruss, J.C. (2008). Solving the riddle of fibromyalgia – an evidence-based practice protocol for the advanced practice nurse. *The journal for nurse practitioners*. 4 (6). 424-437

McKAY, P.G., Duffy, T. and Martin, C.R. (2009). Are chronic fatigue syndrome and fibromyalgia the same? Implications for the provision of appropriate mental health intervention. *Journal of Psychiatry and Mental Health Nursing*. 16. 884-894.

McVeigh, J., McGaughey, H., Hall, M. and Kane, P. (2008). The effectiveness of hydrotherapy in the management of fibromyalgia syndrome: a systematic review. *Rheumatology International*. 29. 119-130.

Nielson, W. and Merski, H.. (2001). Psychosocial Aspects of Fibromyalgia. *Current Pain and Headache Reports*. 5. 330–337

Onieva-Zafra, M.D., Castro-Sánchez, A.M., Matarán-Peñarrocha, G. and Moreno-Lorenzo, C. (2010). Effect of Music as Nursing Intervention for People Diagnosed with Fibromyalgia. *Pain Management Nursing*, Vol - (--). 1-8. Article in press

Polit, D. and Hungler, B. (1995). *Nursing Research Principles and Methods*. Philadelphia: J.B. Lippincott Company.

Shiple, M. (2010). Chronic widespread pain and fibromyalgia syndrome. *Medicine* 38 (4). 202-205.

Siedlecki, S. (2009). Racial Variation in Response to Music in a Sample of African-American and Caucasian Chronic Pain Patients; *Pain Management Nursing*. 10 (1). 14-21

Sommer, C., Häuser, W., Gerhold, K., Joraschky, P., Petzke, F., Tölle, T., Uçeyler, N., Winkelmann, A. and Thieme, K. (2008). Ätiopathogenese und Pathophysiologie des Fibromyalgiesyndroms und chronischer Schmerzen in mehreren Körperregionen [Etiology and pathophysiology of fibromyalgia syndrome and chronic widespread pain]. *Der Schmerz*. 22(3).267-82.

Sylvain, H. and Talbot L. (2002). Synergy towards health: a nursing intervention model for women living with fibromyalgia, and their spouses. *Journal of Advanced Nursing*. 38(3). 264–273.

Taggart, H.M., Arslanian, C.L., Bae, S. and Singh, K. (2003). Effects of T'ai Chi exercise on fibromyalgia symptoms and health-related quality of life. *Orthopaedic Nursing*. 22 (5). 353-360

Taylor, A., Anderson, J., Riedel, S., Lewis, J., Kinser, P. and Bourguignon, C.. (2011). Cranial Electrical Stimulation Improves Symptoms and Functional Status in Individuals with Fibromyalgia. *Pain Management Nursing*, Vol -(--). 1-9. Article in press

U.S. Department of Human Health and Services - Agency for Health Care Research and Quality (2009). *Management of fibromyalgia syndrome in Adults*. <<http://www.guideline.gov/content.aspx?id=14869&search=fibromyalgia>> Read on 28.10.2013

Van Wilgen, C. and Keizer, D. (2012).The Sensitization Model to Explain How Chronic Pain Exists Without Tissue Damage. *Pain Management Nursing*. 13 (1). 60-65

Ware, L.J., Bruckenthal, P., Davis, G. and O'Connor-Von, S. (2009). Factors That Influence Patient Advocacy by Pain Management Nurses: Results of the American Society for Pain Management Nursing Survey. *Pain Management Nursing*. 12 (1). 25-32

Wassem, R., Beckham, N. And Dudley, W. (2001). Test of a Nursing Intervention to Promote Adjustment to Fibromyalgia. *Orthopaedic Nursing*. 20(3). 33–45

Verkamp, E. et al. (2012). A Survey of Conventional and Complementary Therapies Used by Youth with Juvenile-Onset Fibromyalgia. *Pain Management Nursing*, Vol - (--). 1-7. Article in press

Wierwille, L. (2010). Fibromyalgia: diagnosing and managing a complex syndrome. *Journal of the American Academy of Nurse Practitioners*. 24. 184-192.

Vincent, A., Whipple, M., Oh, T., Guderian, J., Barton, D. and Luedtke, C. (2011). Early experience with a brief, multimodal, multidisciplinary treatment program for Fibromyalgia. *Pain Management Nursing*. Vol(-).1-8. Article in press

Wingard, R. (2005). Patient Education and the Nursing Process: Meeting the Patient's needs. *Nephrology Nursing Journal*. 32 (2). 211-214

Wolfe, F., Clauw, D., Fitzcharles, M., Goldenberg, D., Katz, R., Mease, P., Russell, A., Russell, J., Winfield, J.B. and Yunus, M. (2010). The American College of Rheumatology Preliminary Diagnostic Criteria for Fibromyalgia and Measurement of Symptom Severity. *Arthritis Care and Research*. 62(5). 600-610.

World Health Organization's Therapeutic Patient Education – Continuing Education programs for Health Care Providers in the Field of Prevention of Chronic Diseases (1998). <http://www.euro.who.int/__data/assets/pdf_file/0007/145294/E63674.pdf>; read on 27.10.2013

Articles used for literature review

Table 3: Summary of the articles used for the literature review

Article	Study design and purpose	Number of subjects and characteristics	Data collection and analysis	Main findings
<p>Astin, J., Berman, B., Bausell, B., Lee, W., Hochberg, M., and Forys, K. (2003).</p> <p>The efficacy of mindfulness meditation plus Qigong movement therapy in the treatment of fibromyalgia: a randomized controlled trial.</p> <p>The Journal of Rheumatology. 30 (10). 2257-2262</p>	<p>Randomized controlled trial to test the short and long term benefits of mindfulness mediation and Qiong movement therapy in the management of FMS</p>	<p>N=128 randomized in 2 equal groups (control group with education and intervention group).</p>	<p>By assessing pain, depression, tender points count, disability, 6 minute walk and coping strategies at baseline and after 8, 16 and 24 weeks.</p>	<p>Improvements were found in pain, depression, tender points count, disability but not in 6 minute walk. Mindfulness mediation combined with Qiong movements had no superior effect than education but both groups showed wealthy changes after 8 weeks and results were maintained after 6 months. High dropout rate.</p>

<p>Denison, B. (2004). Touch the pain away: new research on therapeutic touch and person with fibromyalgia syndrome. Holistic nursing practice. 18 (3). 142-151.</p>	<p>Experimental study to test the effectiveness of 6 therapeutic touch on experience of pain and quality of life in patients with FMS</p>	<p>N=10 in intervention group and n=5 in control, diagnosed with FMS, >18 years old, unsatisfied with current pain management</p>	<p>Patients divided in 10 in TT group and 5 in GG group. Electronic infrared thermography and SF-MPQ, modified VAS, and FHAQ with pre and post measurements</p>	<p>Finding partially supported therapeutic touch in treatment of pain and improvement of quality of life but more studies needed</p>
<p>Evcik, D., Yigit, I., Pusak, H. and Kavuncu, V. (2008). Effectiveness of aquatic therapy in the treatment of fibromyalgia syndrome: a randomized controlled open study. Rheumatology International. 28. 885-890.</p>	<p>RCOS to investigate the efficacy of 60 minutes, 3 times a week during 5 weeks aquatic exercises vs home based exercise program in people with FMS.</p>	<p>Intervention n=33 and control n=30; average age 43.4 years old</p>	<p>Evaluation by VAS, NTP, BDI, FIQ at weeks 4, 12,24; comorbidities also investigated as well as ESR and biochemical markers</p>	<p>Both aquatic therapy and home-based exercise program (control) had benefits but on pain only aquatic therapy seems to have long term effects.</p>
<p>Fioravanti et al. (2007). Effects of mud-bath treatment on fibromyalgia patients: a randomized clinical trial. Rheumatology International. 27- 1157-1161.</p>	<p>RCT to evaluate effects and tolerability of 12 mud bath treatments in FMS that poorly respond to pharmacological treatments</p>	<p>N=80, divided equally in 2 groups. 78 women, 20-60 years old range</p>	<p>FIQ, VAS, tender point count, HAQ and AIMS</p>	<p>Study shows beneficial efforts in pain, fatigue, general health and physical functioning. Longer follow-ups and large group experimental trial shall be performed to support these results. No drop outs.</p>

<p>Goldenberg, D., Burckhardt C., Crofford L. (2004).</p> <p>Management of Fibromyalgia Syndrome.</p> <p>Journal of the American Medical Association. 292(19). 2388-2395</p>	<p>Literature review conducted by 13 experts in various fields to find consensus on the management of FMS.</p>	<p>505 articles</p>	<p>Literature retrieved by several search engines, reviewed and classified according to level of evidence and analyzed by content analysis.</p>	<p>Strong evidence was found for medications as amitriptyline and cyclobenzaprine and for nonmedical therapies as cardiovascular exercise, cognitive behavioral therapy, patient education and multidisciplinary forms for management.</p>
<p>Hammond, A. and Freeman, K. (2006).</p> <p>Community patient education and exercise for people with fibromyalgia: a parallel group randomized control trial.</p> <p>Clinical rehabilitation. 20. 835-846.</p>	<p>Randomized, parallel group trial to evaluate the effects of a programme containing community patient education-exercise using a cognitive behavioral approach</p>	<p>N=183 randomized in patient education/exercise group and relaxation group. 120 in 133 were women, average age of 48.53.</p>	<p>FIQ, ASES, RAI, and number of doctor visit in the previous 4 months recorded</p>	<p>Short term improvements were found in the education/exercise programme especially in self-efficacy for managing pain, less helplessness and anxiety and doctor visits. However at 8 months there were no apparent differences between the groups</p> <p>Some drop-out was observed, especially in the relaxation group.</p>

<p>Hävermärk, A. and Langius-Eklöf, A. (2006).</p> <p>Long-term follow up of a physical therapy programme for patients with fibromyalgia syndrome.</p> <p>Scandinavian Journal of Caring Science. 20. 315-322.</p>	<p>Longitudinal study to evaluate in the long-term the impact of a physical therapy based educational programme on FMS patients.</p>	<p>Final study sample of n=240 (237 female), average age of 51 years old.</p>	<p>Evaluation between 1993 and 1998. FIQ, SOC, RQ and SMI were sent to patients</p>	<p>The study showed improvement in pain and well-being but follow-ups show that only well-being was maintained in the long term.</p>
<p>Karper, W., Jannes, C. and Hampton, J. (2006).</p> <p>Fibromyalgia Syndrome: The beneficial effects of exercise.</p> <p>Rehabilitation Nursing. 31(5). 193-198</p>	<p>Clinical trial for an exercise program over 5 years</p>	<p>Women, 49-65yrs old, white, middle-lower class and diagnosed with FMS</p>	<p>Programme tailored to implement gradually new activities; Physical activities, interviews, 10-point analog scale measuring pain</p>	<p>The findings support a programme containing aerobic exercise, strength training and range of motion exercise with low impact and producing no discomfort 5 days a week</p>
<p>Kiyak, E.K. (2009).</p> <p>A new nonpharmacological method in fibromyalgia: the use of wool.</p> <p>The journal of alternative and complementary medicine. 15(4). 399-405</p>	<p>Pilot study to assess the impact of the use of wool bed linens and underwear in the symptoms of FMS</p>	<p>N=50, divided equally in 2 groups. all female with FMS diagnosis</p>	<p>VAS, FIQ and tender point count with pre and post-test evaluation</p>	<p>Patients in intervention group reported improvement in pain levels and tender points count.</p> <p>No drop-outs</p>

<p>Mannerkorpi, K. and Henriks-son, C. (2007).</p> <p>Non-pharmacological treatment of chronic widespread musculo-skeletal pain.</p> <p>Best Practice & Research Clinical Rheumatology. 21(3). S13-S34</p>	<p>Literature review to find non-pharmacological treatments for patients with fibromyalgia</p>	<p>31 studies</p>	<p>Articles retrieved in PubMed. Only RCT with more than 30 participants and published in English language were chosen. Data analysis by content analysis.</p>	<p>Physical exercise in different modalities and intensity, education and sensory stimulation like acupuncture and massage were found to improve symptoms of FMS patients. Multimodal programs have synergetic effects</p>
<p>McVeigh, J., McGaughey, H., Hall, M. and Kane, P. (2008).</p> <p>The effectiveness of hydrotherapy in the management of fibromyalgia syndrome: a systematic review.</p> <p>Rheumatology International. 29. 119-130.</p>	<p>Systematic review to find the efficacy of all form of hydrotherapy in the management of FMS</p>	<p>10 articles</p>	<p>Articles chosen from several databases, rated by relevance. Methodology of analysis was content analysis.</p>	<p>Balneotherapy, pool-based exercise and Spa therapy were found highly effective in the management of Fibromyalgia Syndrome, especially improving pain, health status and tender point count.</p>
<p>Taggart, H.M., Arslanian, C.L., Bae, S. and Singh, K. (2003).</p> <p>Effects of T'ai Chi exercise on fibromyalgia symptoms and health-related quality of life.</p> <p>Orthopedics Nursing. 22 (5). 353-360</p>	<p>Experimental design to evaluate a 6 weeks, 1h 2 times a week T'ai Chi intervention to reduce FMS symptoms</p>	<p>N=37, between 26-80 years old, women with FMS diagnostics.</p>	<p>Measurements with CWHQ, FIQ and Short-form 36, with pre and post-test design</p>	<p>T'ai Chi is a potential help for pain management and findings support improvements in condition. However, bigger studies are needed. High dropout rate.</p>

Abbreviations:

AIMS 1- Arthritis impact measurement Scales, BAS-H – Body awareness Scale-Health, BDI – Beck’s Depression Inventory, CNP- central neuropathic pain, CWHQ – Center for Wellbeing Health History Questionnaire, FHAQ –Fibromyalgia Health Assessment Questionnaire , FIQ – Fibromyalgia Impact questionnaire, HAQ – Health assessment questionnaire, MPI – Multidimensional pain inventory, NTP – number of tender points, QOLS-Quality of life scale, RCOS – randomized controlled open study, RCT – randomized control trial, RQ –The Rosenlund Questionnaire, SF-36 – Short-form 36, SF-MPQ – Short-form McGill Pain Questionnaire, SMI – Self motivation inventory, SOC – sense of coherence scale, TPC – tender points count, VAS-Visual analogue Scale

