and sex- matched controls. The proportion of psychiatric disorders (anxiety, bipolar disease, depression, psychoses.) in patients with FMS was significantly higher compared with their proportion in controls (30.1% vs. 12.2% respectively, $p<0.001$, OR =3.09, 95% CI: 2.96–3.22). The proportion of rheumatic disorders was also significantly higher in FMS patients compared to controls (10.8% and 3.15% respectively, $p<0.001$, OR =3.73, 95% CI: 3.49–3.99). A multivariate logistic regression model demonstrated that FMS was significantly associated with psychiatric disorders and rheumatic diseases after controlling for confounders, including age, sex, socioeconomic status (SES) and BMI (psychiatric multivariate OR =3.17, $p<0.01$ 95% CI: 3.13–3.21; rheumatic multivariate OR =3.72, $p<0.01$ 95% CI: 3.65–3.79). In contrast, 1365 (1145 controls, 220 FMS) chronic heart failure patients and 1970 (1668 controls, 302 FMS) chronic renal failure patients were not found to be significantly associated with FMS (CHF: OR =0.96, $p<0.566$ 95% CI: 0.83–1.11; CRF: OR =0.90, $p<0.098$ 95% CI: 0.80–1.02).

**Conclusions:** Patients with the FMS have a greater proportion of psychiatric and rheumatic disorders than matched controls. Consequently, physicians treating patients with chronic illnesses in general and rheumatic or psychiatric conditions in particular, should be aware of this high co morbidity rate.

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**Disclosure of Interest:** None declared

**DOI:** 10.1136/annrheumdis-2016-eular.4954

## THU0547 IS PAIN CATASTROPHISING ASSOCIATED WITH IMPAIRED CONDITIONED PAIN MODULATION IN PEOPLE WITH CHRONIC WIDESPREAD PAIN?

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**Background:** Fibromyalgia (FM) may be considered part of a clinical continuum with chronic widespread pain, which is its cardinal symptom [1]. These conditions are associated with abnormal nociceptive system processing, which is characterised by central sensitisation and signs of allodynia and hyperalgesia [2, 3]. Deficient endogenous pain inhibition has been implicated in the aetiology of FM [4], which may be measured by assessing conditioned pain modulation (CPM). Psychological factors such as pain catastrophising may also play a role in the heightened pain experience in FM. There is evidence that pain catastrophising may be associated with reduced CPM efficacy [5]. However, it is not yet known whether the CPM dysfunction in FM occurs at a spinal or supraspinal level and if this is related to pain catastrophising.

**Objectives:** The aims of the present study were to: (1) compare the function of the CPM response in healthy controls and individuals with chronic widespread pain; (2) to explore the relationship between pain catastrophizing and CPM efficacy; and (3) to examine the level of the nervous system where CPM dysfunction may occur in individuals with chronic widespread pain.

**Methods:** Twenty-three people with chronic widespread pain (19 of which met the criteria for FM) and 22 age- and gender-matched healthy control participants took part. Pain beliefs and depression were assessed using the Pain Catastrophising Scale (PCS) and the Depression, Anxiety, and Stress Scale (DASS), respectively. CPM efficacy was assessed by comparing the nociceptive flexion reflex (NFR) area and pain ratings elicited by electrostimulation of the dominant foot (the test stimulus) before and during a cold pressor test applied to the contralateral hand (the conditioning stimulus).

**Results:** The chronic widespread pain group had significantly higher scores in the PCS and DASS ($P<0.05$). In the chronic widespread pain group, test and conditioned reflex areas ($P=0.06$) and verbal pain ratings ($P=0.09$) were not significantly different. In contrast, the control group had a significantly smaller reflex area ($P=0.001$) and a lower verbal pain rating ($P=0.02$) during conditioning compared to the test stimulus alone. There were no significant correlations between catastrophising and CPM efficacy using either VAS or nociceptive NFR measures in either the widespread pain or control group ($P>0.05$).

**Conclusions:** This study suggests that, compared to healthy controls, people with chronic widespread pain have a dysfunctional CPM response and therefore, impaired endogenous pain inhibition. However, there was no evidence of a relationship between pain catastrophising and CPM efficacy at either spinal or supraspinal levels.

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**Disclosure of Interest:** None declared

**DOI:** 10.1136/annrheumdis-2016-eular.2301

## THU0548 SLEEP ARCHITECTURE AND CLINICAL PARAMETERS IN FIBROMYALGIA AND OSTEOARTHRITIS

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**Background:** Non restorative sleep (NRS) is a characteristic symptom of fibromyalgia (FM). A number of studies have reported abnormalities of sleep architecture on polysomnography (PSG) including alpha wave intrusion (AWI) during delta wave sleep (DWS). However, AWI in DWS has also been reported in other conditions including depression or in chronic fatigue. We have compared FM patients with patients who had sleep disturbance from osteoarthritis (OA) and a group of normal healthy control subjects (NHC) to determine if there are specific abnormalities of sleep architecture in FM related to clinical parameters.

**Methods:** We studied 19 newly diagnosed FM patients (mean age 41yrs, range 19–58yrs), 17 with OA (mean age 46yrs, range 19–63yrs) with localized pain and sleep disturbance, and ten NHC (mean age 38yrs, range 23–61yrs). All participants were female. The diagnosis was confirmed by a consultant rheumatologist. None were being treated for anxiety or depression or had taken antidepressant, psychoactive or sedative drugs for at least 2 weeks prior to analysis. All completed pain score (VAS), Brief Pain Inventory (BPI), Fatigue Severity Scale (FSS), Epworth Sleepiness Scale (EPS), Pittsburgh Sleep Quality Index (PSQI), Centre for Epidemiologic Studies Depression Scale (CESD), State and Trait Anxiety Scale (STAS), Multidimensional Scales of Health Locus of Control and Perceived Social Support (HLC), and 2 weeks actigraphy and 2 consecutive nights of polysomnography (PSG) at home, scored by a trained sleep researcher. Each frequency band was decomposed and power averaged using spectral analysis.

**Results:** Sleep efficiency was significantly worse in FM and OA ($p=0.025$). Sleep stage transitions (SST) were significantly increased in FM and OA ($p=0.019$) with a marked increase in SST per hour ($p=0.002$) compared with NHC with no significant difference between FM and OA. Alpha waves were increased during stage 3 sleep (DWS) in both FM and OA compared with NHC but also with no difference between FM and OA. There was a numerical increase in spindle frequency during non REM sleep compared with NHC, more in FM than OA but with wide variation ($1.12 \pm 0.8$; $0.98 \pm 0.39$; $0.61 \pm 0.27$ mpl). Pain scores in FM and OA groups were significantly different to NHC; mean difference in BPI of 6.07 and 4.83 respectively ($p<.001$). FM had significantly greater fatigue and EPS than OA (M diff14.41, $p<.001$; 3.42, $p=.033$) and NHC (M diff=29.87, $p<.001$; 3.99, $p=0.34$). PSQI was significantly greater than HC in both FM and OA (10.19 and 7.18, $p<.001$). The difference between FM and OA was significant ($p=.023$). There were highly significant differences between the 3 groups for CESD (FM 23.11; OA16.06; NHC4.8, $p<0.001$), STAS (49.6; 39.8; 31.9, $p<0.001$), HLC ($p<0.001$), and neuroticism (15.7; 13.5; 9.3 $p<0.01$).

**Conclusions:** Patients with FM had a similar duration of sleep to this group of OA patients but had a significant difference in subjective sleep quality, with significantly increased fatigue and sleepiness. They also had more anxiety, depression and neuroticism. AWI in DWS in FM is not specific and is similar in disturbed sleep from OA, but increased spindle frequency may be a feature of FM. We hypothesise that psychological factors in FM are linked to both sleep quality and fatigue and NRS may result from an increased rate of SST with frequent fluctuation between light and deep sleep.

**Disclosure of Interest:** None declared

**DOI:** 10.1136/annrheumdis-2016-eular.4289

## THU0549 FATIGUE AND THE ROLE OF SLEEP IN FIBROMYALGIA: OBJECTIVE AND SUBJECTIVE MEASURES

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**Background:** Fibromyalgia (FM) is a chronic widespread pain syndrome associated with symptoms such as sleep disorders, fatigue, depression, anxiety and cognitive alterations with a severe impairment of the life quality.

**Objectives:** The aim of this study is to examine the relationship between subjective and objective assessment of sleep quality and to analyze the predictors of fatigue in an Italian cohort of FM patients.

**Methods:** Adult outpatients diagnosed with FM, fulfilling both ACR/EULAR 1990 and 2010 criteria were enrolled (1,2). The objective measure of sleep was assessed through an actigraph (AMI Motionlogger Watch), a device which records the parameters of sleep based on electronic measure of the continuous motion detected by an accelerometer. During the study period the patients were invited to wear the actigraph on the non-dominant wrist for one week and concurrently to complete a sleep diary. After seven days the patients returned the actigraph and answered a structured interview conducted by a trained junior psychologist. Subjective quality of sleep was assessed by the Sleep Disorder Questionnaire (SDQ) (3) and the patients filled out psychometric scales as the Brief Symptom Inventory (BSI) for anxiety and depression (4) and the Checklist of Individual Strength (CIS20) for perceived fatigue (5). Both pharmacological and not pharmacological treatments were not changed 1 month before and during the study.

**Results:** Twenty-one female patients completed the study, mean age of 46.9 years (range 32–68) and mean disease duration of 7.5 years (range 1–27). The majority of 21 FM patients interviewed (76.2%) described their sleep quality as poor or very poor (mean value 3.10 ±0.89 SD on 4 point Likert scale). All patients (100%) reported insomnia complaints, and 18 (81%) met the DSM V (Diagnostic and Statistical Manual of Mental Disorders) criteria for a diagnosis of Difficulties Initiating and Maintaining Sleep (DIMS). The patients' perception about the number of slept hours (M=5.7) was significantly lower ($t=3.292$, $p<0.005$) than the actigraphic data (M=6.8). Total Sleep Time (TST) measured through actigraphy was directly correlated with the intensity of perceived fatigue ($r=.481$; $p<0.05$). A multiple regression analysis considering TST, Total Time in Bed (TTB), depression, and type of fatigue self management, showed TST as the variable that gave a major and unique contribute to the prediction of perceived fatigue. Mean values of TST and TTB both negatively correlated with FM duration (respectively $r=-.589$, $p<0.005$; $r=-.565$, $p<0.008$).

**Conclusions:** These findings confirm the high prevalence of sleep disturbances in FM and suggest that sleep quality and duration could play an important role in the perceived fatigue severity. Intervention programs for FM should include sleep regulation.

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**Disclosure of Interest:** None declared

**DOI:** 10.1136/annrheumdis-2016-eular.5054

## THU0550 EARLY MULTIDISCIPLINARY INTERVENTIONS TO PROMOTE WORK PARTICIPATION IN PEOPLE WITH REGIONAL MUSCULOSKELETAL PAIN: A SYSTEMATIC REVIEW

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**Background:** Musculoskeletal disorders are amongst the leading causes of disability in the working age population. Whilst there is a growing body of evidence suggesting that early targeted multidisciplinary interventions can promote work retention and prevent disability, the evidence is far from conclusive as to which interventions are the most effective.

**Objectives:** To review randomised controlled trials evaluating the effectiveness of early interventions in promoting work participation in adults with regional musculoskeletal pain (RMSKP).

**Methods:** CENTRAL, MEDLINE, EMBASE, Scopus, PEDro and OT Seeker (1990 to April 2015) were searched. Reference lists of identified articles and reviews were hand searched. Only RCTs reporting on work-related outcomes were eligible for inclusion. The intervention had to include two or more elements of the biopsychosocial model delivered as an integrated programme. Participants were either experiencing difficulties at work or had less than three months sick leave as a result of their RMSKP at enrolment. Each RCT was assessed independently by two reviewers for risk of bias. Results were analysed by hazard ratios for return to work data, while continuous outcomes were analysed as mean difference (MD) with 95% confidence intervals.

**Results:** 19 RCTS were included; the considerable variation in the components employed in the interventions limited the option to pool the data statistically using meta-analysis. There was some evidence that programmes involving a stepped care approach (4 studies) increased the probability of return to work at the 12-month follow-up [HR 1.29 (95% CI, 1.03 to 1.61), p=0.03]. However, preliminary analyses indicate a lack of consistent evidence for effects on reducing sickness absences, pain reduction and functional improvement across the intervention types.

**Conclusions:** The lack of agreement as to what constitutes "early" in the context of treating RMSKP may have contributed to the rather ambiguous findings. In addition, the different health and social insurance systems across the trials have made it difficult to generalise the results. There remains a need to establish the active components that promote work retention in this population, and to identify the patients who are most likely to benefit from an integrated and cost-effective intervention.

**Disclosure of Interest:** None declared

**DOI:** 10.1136/annrheumdis-2016-eular.1796

## THU0551 NOVEL SJÖGREN'S AUTOANTIBODIES FOUND IN FIBROMYALGIA PATIENTS WITH SICCA AND/OR XEROSTOMIA

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**Background:** A significant proportion of patients with fibromyalgia complain of dry eyes and mouth. The 2010 preliminary criteria for fibromyalgia even includes dry eyes and mouth as part of the somatic symptoms severity complex used to diagnose this condition. A significant proportion of Sjögren's (Sjö) patients also complain of fibromyalgia symptoms and there is literature that questions the interplay of these two disorders. Recently, novel autoantibodies, SP-1, CA6, and PSP, have been described in early Sjögren's syndrome (SS). These early markers present themselves before the classic autoantibodies, such as Ro, La, ANA, and RF. A recent paper found that 76% of patients with idiopathic xerostomia and exophthalmia for less than 2 years were positive for the early markers, while only 31% had antibodies to Ro and La. The authors concluded that SP-1, CA6, and PSP may be useful markers for identifying patients with SS at an early stage of the disease.

**Objectives:** This study aims to examine the relationship between SS and fibromyalgia by testing patients with fibromyalgia, that also complain of xerostomia and sicca symptoms, for Sjö markers Ro, La, SP-1, CA6, and PSP.

**Methods:** Beginning in April 2013, a cohort of patients was identified that presented with symptoms of fibromyalgia, meeting both the 1990 and 2010 preliminary criteria. These patients were further questioned about xerostomia and sicca symptoms. Patients that admitted to using artificial tears at least biweekly, drinking water excessively, or have previously experienced a blocked tear duct, but did not meet the strict diagnostic criteria for SS and did not have elevated inflammatory markers ESR or CRP, were selected for this study. Serum from study patients was sent to a tertiary lab, Immco Diagnostics, for testing of the classic (Ro, La) and early Sjö (SP-1, CA6, PSP) markers. Patients testing positive for the Sjö markers were provided with literature on the disease and offered appropriate treatment options, such as hydroxychloroquine.

**Results:** As of January 2016, 210 patients were selected for this study and tested for the Sjö markers. 91.0% of the patients were female and 8.6% of the patients were male. The average patient age was 56.5. 171 of the study patients were tested for both the early and classic markers, while 39 were tested for only the early markers. Of the patients that were evaluated for both the early and classic Sjö markers, 29.8% (51) tested positive for SS. 39 (22.8%) of the patients were positive for the early Sjö markers, 9.4% (16) were positive for the classic Sjö markers, and 2.3% (4) were positive for both the early and late Sjö markers. Further analysis of all the patients that tested positive for the early Sjö markers (n=47), found 74.5% (35) were positive for SP-1, 8.5% (4) were positive for CA6 and 44.7% (21) were positive for PSP. 68.1% (32) of these patients were positive for only one of the early markers and 15 (31.9%) were positive for more than one early marker.

**Conclusions:** In this cohort of fibromyalgia patients, about 1/3 of patients that were tested for both the early and classic Sjö markers tested positive for SS, with the majority of those patients being positive for one or more of the early Sjö markers. This suggests that autoimmunity, specifically early Sjögren's syndrome, may be a confounding variable in the pathophysiology of fibromyalgia.

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**Disclosure of Interest:** None declared

**DOI:** 10.1136/annrheumdis-2016-eular.4189

## THU0552 HAPLOTYPES OF VITAMIN D RECEPTOR GENE: BOTH RISKY AND PROTECTIVE FOR FIBROMIYALGIA (FMS)

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**Background:** Clinical observations suggest that vitamin D may influence fibromyalgia etiology. FMS and vitamin D deficiency share a similar symptom profile; the relationship between these conditions is unclear. Vitamin D receptor is a crucial mediator of the symptoms of vitamin D deficiency. Thus, vitamin D receptor gene polymorphisms or haplotypes may contribute to vitamin D resistance.

**Objectives:** This study evaluated the clinical relationship between FMS and vitamin D gene among Turkish FMS patients.

**Methods:** 73 patients with FMS were diagnosed according to the ACR 2010 criteria; the control group included 61 healthy unrelated volunteers. The rs2228570 (Fok I), rs1544410 (Bsm I), rs7975232 (Apa I) and (rs731236) Taq I polymorphisms were examined using PCR-RFLP.

**Results:** In individual SNP analyses, none of the snps have been found to be associated with FMS (p values are 0.491, 0.477, 0.207, and 0.736 respectively). However, it has been detected that there is a strong association between haplotypes of VDR gene polymorphisms and FMS. As a result of this study, the effect of haplotypes is shown to be both risky and protective. P value of risk haplotypes ATC (rs2228570, rs1544410, rs7975232) is 0,015 (26,5%) and