

2. LBP

Individuals With and Without Low Back Pain Use Different Motor Control Strategies to Achieve Spinal Stiffness During the Prone Instability Test

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+ AFFILIATIONS

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Background

The prone instability test is used to identify individuals with low back pain (LBP) who would benefit from trunk stabilization exercises. Although activity from muscles during the leg raising portion of the prone instability test theoretically enhances spinal stiffness and reduces pain, evidence for this is lacking.

Objectives

To compare and contrast: 1) pain and stiffness changes between prone instability testing positions, and 2) muscle activation patterns during the prone instability test leg raise in individuals with and without LBP.

Methods

Laboratory case-control design. Participants were 10 with and 10 without LBP. Spinal stiffness was measured using a bending beam model and 3-dimensional kinematic data. Stiffness changes were compared across the test positions and between groups. Surface EMG data were collected on trunk and limb musculature. Principal component analysis was used to extract muscle synergies.

Results

Spinal stiffness increased across testing positions in all participants ($P < .05$). Participants with LBP experienced reduced pain during the test ($P = .0001$). No between group difference was found in spinal stiffness during leg raising in the test ($P > .05$). Participants without LBP used 3 muscle synergies during the leg raise. Participants with LBP used 2 muscle synergies.

Conclusion

Spinal stiffness increased in all participants; however, participants without LBP demonstrated a muscle synergy pattern where each synergy was associated with a distinct function of the prone instability test. Participants with LBP used a more global stabilization pattern which may reflect a maladaptive method of enhancing spinal stability. *J Orthop Sports Phys Ther*, Epub 3 Aug 2019. doi:10.2519/jospt.2019.8577

8. VISCERA

Coffee decreases atrial fibrillation

J Am Heart Assoc. 2019 Aug 6;8(15):e011346. doi: 10.1161/JAHA.118.011346. Epub 2019 Aug 5.

Coffee Consumption and Risk of Atrial Fibrillation in the Physicians' Health Study.

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Background Although coffee consumption is often reported as a trigger for atrial fibrillation (AF) among patients with paroxysmal AF, prospective studies on the relation of coffee consumption with AF risk have been inconsistent. Hence, we sought to assess the association between coffee consumption and risk of AF in men.

Methods and Results We prospectively studied men who participated in the Physicians' Health Study (N=18 960). Coffee consumption was assessed through self-reported food frequency questionnaires. The incidence of AF was assessed through annual questionnaires and validated through review of medical records in a subsample. Cox proportional hazard models were used to calculate hazard ratios and 95% CIs of AF. The average age was 66.1 years. A total of 2098 new cases of AF occurred during a mean follow-up of 9 years. Hazard ratios (95% CI) of AF were 1.0 (reference), 0.85 (0.71-1.02), 1.07 (0.88-1.30), 0.93 (0.74-1.17), 0.85 (0.74-0.98), 0.86 (0.76-0.97), and 0.96 (0.80-1.14) for coffee consumption of rarely/never, ≤1 cup/week, 2 to 4 cups/week, 5 to 6 cups/week, 1 cup/day, 2 to 3 cups/day, and 4+ cups/day, respectively; adjusting for age, smoking, alcohol intake, and exercise (P for nonlinear trend=0.01). In a secondary analysis the multivariable adjusted hazard ratio (95% CI) of AF per standard deviation (149-mg) change in caffeine intake was 0.97 (0.92-1.02).

Conclusions Our data suggest a lower risk of AF among men who reported coffee consumption of 1 to 3 cups/day.

Fiber more important than water in constipation

J Hum Nutr Diet. 2019 Aug;32(4):422-431. doi: 10.1111/jhn.12589. Epub 2019 May 13.

Lower dietary fibre intake, but not total water consumption, is associated with constipation: a population-based analysis.

Shen L¹, Huang C¹, Lu X¹, Xu X¹, Jiang Z¹, Zhu C¹.

BACKGROUND:

Associations between constipation and dietary fibre and water intake, as well as various lifestyle factors, have not been fully evaluated. The present study aimed to investigate associations between fibre and water intake and constipation, as well as other possible risk factors for constipation, in a large adult population.

METHODS:

Data obtained from 14 024 adults aged ≥ 20 years from three cycles of the National Health and Nutrition Examination Survey (NHANES) 2005-2010, who had completed a bowel health questionnaire, were included in this cross-sectional population-based study. Variables included demographics, lifestyle and dietary factors, comorbidities and laboratory parameters. Logistic regression analyses were performed to determine associations between potential risk factors and constipation.

RESULTS:

Among 17 132 participants ≥ 20 years, 2401 (14%) did not complete bowel health questionnaires and were excluded, along with pregnant women (n = 461) and participants without dietary sample weight on day 1 (n = 246), leaving data from 14 024 participants available for analysis.

Multivariate analysis revealed that black race/ethnicity [odds ratio (OR) = 1.380, 95% confidence interval (CI) = 1.054-1.809], a lower than 12th grade education (OR = 1.420, 95% CI = 1.154-1.749) or high school education (OR = 1.339, 95% CI = 1.057-1.697), lower income/poverty ratios (1.3-3.49 versus ≥ 3.5 : OR = 1.261, 95% CI = 1.015-1.567), normal weight (OR = 1.913, 95% CI = 1.534-2.386) or overweight (OR = 1.536, 95% CI = 1.207-1.955), depression (OR = 1.610, 95% CI = 1.119-2.315) and poor teeth (OR = 1.441, 95% CI = 1.100-1.888) were associated with an increased risk for constipation. Lower dietary fibre intake was associated with a greater risk of constipation. Total water consumption was significantly associated with an increased risk of constipation in univariate analysis, but not in multivariate analysis.

CONCLUSIONS:

Lower dietary fibre intake, but not poor water consumption, was associated with a greater risk of constipation in US adults.

13 B. TMJ/ORAL**Bruxism and TMJ in adolescents**

ORIGINAL ARTICLE

Association between bruxism and temporomandibular disorders in children: A systematic review and meta-analysis

Larissa de Oliveira Reis Rosangela Almeida Ribeiro Carolina Castro Martins Karina Lopes Devito

<https://doi.org/10.1111/ipd.12496>

Background

Bruxism in children and its relation to the development of temporomandibular disorders (TMD) has not been clearly determined yet.

Aim

The objective of this systematic review was to evaluate the possible association between bruxism and TMD in children.

Design

Seven databases were searched, and 497 articles were assessed. Methodological quality was assessed through Newcastle-Ottawa Scale. The meta-analysis was performed with the articles in which extraction of data was possible and the summary effect measure through odds ratio (OR) and respective 95% confidence intervals (CIs). Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) was used to assess the certainty of evidence.

Results

Ten cross-sectional studies were included in the systematic review. Of these, 8 showed a statistically significant association between bruxism and TMD. Seven studies however presented a high risk of bias. The meta-analysis was performed with 3 articles and obtained an OR of 2.97 (95% CI ranging from 1.72-5.15), indicating that children with bruxism are 2.97 times more likely to present TMD, with very low level of certainty defined by GRADE.

Conclusions

Although the studies showed high risk of bias, the qualitative analysis of individual studies showed that the children with bruxism have greater chance of developing TMD.

13 D. SLEEP**Sleep and obesity**

JAMA Intern Med. 2019 Jun 10. doi: 10.1001/jamainternmed.2019.0571.

Association of Exposure to Artificial Light at Night While Sleeping With Risk of Obesity in Women.

Park YM¹, White AJ¹, Jackson CL¹, Weinberg CR², Sandler DP¹.

Abstract

IMPORTANCE: Short sleep has been associated with obesity, but to date the association between exposure to artificial light at night (ALAN) while sleeping and obesity is unknown.

OBJECTIVE: To determine whether ALAN exposure while sleeping is associated with the prevalence and risk of obesity.

DESIGN, SETTING, AND PARTICIPANTS: This baseline and prospective analysis included women aged 35 to 74 years enrolled in the Sister Study in all 50 US states and Puerto Rico from July 2003 through March 2009. Follow-up was completed on August 14, 2015. A total of 43 722 women with no history of cancer or cardiovascular disease who were not shift workers, daytime sleepers, or pregnant at baseline were included in the analysis. Data were analyzed from September 1, 2017, through December 31, 2018.

EXPOSURES: Artificial light at night while sleeping reported at enrollment, categorized as no light, small nightlight in the room, light outside the room, and light or television in the room.

MAIN OUTCOMES AND MEASURES: Prevalent obesity at baseline was based on measured general obesity (body mass index [BMI] ≥ 30.0) and central obesity (waist circumference [WC] ≥ 88 cm, waist-to-hip ratio [WHR] ≥ 0.85 , or waist-to-height ratio [WHtR] ≥ 0.5). To evaluate incident overweight and obesity, self-reported BMI at enrollment was compared with self-reported BMI at follow-up (mean [SD] follow-up, 5.7 [1.0] years). Generalized log-linear models with robust error variance were used to estimate multivariable-adjusted prevalence ratios (PRs) and relative risks (RRs) with 95% CIs for prevalent and incident obesity.

RESULTS: Among the population of 43 722 women (mean [SD] age, 55.4 [8.9] years), having any ALAN exposure while sleeping was positively associated with a higher prevalence of obesity at baseline, as measured using BMI (PR, 1.03; 95% CI, 1.02-1.03), WC (PR, 1.12; 95% CI, 1.09-1.16), WHR (PR, 1.04; 95% CI, 1.00-1.08), and WHtR (PR, 1.07; 95% CI, 1.04-1.09), after adjusting for confounding factors, with $P < .001$ for trend for each measure. Having any ALAN exposure while sleeping was also associated with incident obesity (RR, 1.19; 95% CI, 1.06-1.34). Compared with no ALAN, sleeping with a television or a light on in the room was associated with gaining 5 kg or more (RR, 1.17; 95% CI, 1.08-1.27; $P < .001$ for trend), a BMI increase of 10% or more (RR, 1.13; 95% CI, 1.02-1.26; $P = .04$ for trend), incident overweight (RR, 1.22; 95% CI, 1.06-1.40; $P = .03$ for trend), and incident obesity (RR, 1.33; 95% CI, 1.13-1.57; $P < .001$ for trend). Results were supported by sensitivity analyses and additional multivariable analyses including potential mediators such as sleep duration and quality, diet, and physical activity.

CONCLUSIONS AND RELEVANCE:

These results suggest that exposure to ALAN while sleeping may be a risk factor for weight gain and development of overweight or obesity. Further prospective and interventional studies could help elucidate this association and clarify whether lowering exposure to ALAN while sleeping can promote obesity prevention.

insomnia and CA

Does insomnia predict a high risk of cancer? A systematic review and meta-analysis of cohort studies

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<https://doi.org/10.1111/jsr.12876>

Recently, emerging studies on the relationship between insomnia, the most common sleep disorder, and cancer have been published, but with inconsistent results.

With the development of society and the accelerated pace of life, more and more people experience insomnia. Therefore, it is important to clarify the association. Relevant literature was obtained through a search of seven databases and supplementary searches. After a strict screening, eight cohort studies (seven prospective and one retrospective) involving 578,809 participants and 7,451 cancer events were incorporated into our analysis. The results demonstrate a modest 24% overall increased risk of cancer for individuals with insomnia in comparison to those without insomnia. The sensitivity analysis shows that the correlation between the two is stable. Subgroup analyses show that the risk of developing cancer was significantly higher in studies conducted in women (HR = 1.24; 95% CI, 1.01–1.53), but not in men (HR = 1.28; 95% CI, 0.90–1.80). Similarly, in terms of specific cancer types, the pooled HR was only significantly higher in thyroid cancer (HR = 1.36; 95% CI, 1.12–1.65) and not in other types of cancer ($p > 0.05$).

Our findings suggest that insomnia may serve as an early warning sign of the onset of cancer and provide an opportunity for early detection and early intervention.

Our findings should be treated with caution because of the limited number of included studies and potential bias. More additional studies are warranted to provide more information on the carcinogenic effect of insomnia.

14. HEADACHES

Caffeine can increase HA

Prospective Cohort Study of Caffeinated Beverage Intake as a Potential Trigger of Headaches among Migraineurs

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DOI: <https://doi.org/10.1016/j.amjmed.2019.02.015>

Objective

We aimed to evaluate the role of caffeinated beverage intake as a potential trigger of migraine headaches on that day or on the following day.

Methods

In this prospective cohort study, 101 adults with episodic migraine completed electronic diaries every morning and evening. Ninety-eight participants completed at least 6 weeks of diaries in March 2016-October 2017. Every day, participants reported caffeinated beverage intake, other lifestyle factors, and the timing and characteristics of each migraine headache. We compared a participant's incidence of migraines on days with caffeinated beverage intake to the incidence of migraines among the same individual on days with no intake, accounting for day of week. We used conditional logistic regression to estimate odds ratios (OR) and 95% confidence intervals.

Results

Among 98 participants (86 women, 12 men) with mean age 35.1 years, 83% white, and 10% Hispanic or Latino, the average age when headaches started was 16.3 years. In total, the participants reported 825 migraines during 4467 days of observation. There was a statistically significant nonlinear association between the number of caffeinated beverages and the odds of migraine headache occurrence on that day (P -quadratic trend = .024), though estimates for each level of intake were not statistically significant. The associations varied according to habitual intake and oral contraceptive use.

Conclusions

There was a nonlinear association between caffeinated beverage intake and the odds of migraine headache occurrence on that day. This suggests that high levels of caffeinated beverage intake may be a trigger of migraine headaches on that day.

16. CONCUSSIONS

NFL concussion

Ann Biomed Eng. 2019 Aug 6. doi: 10.1007/s10439-019-02335-9.

Repetitive Head Impact Exposure in College Football Following an NCAA Rule Change to Eliminate Two-A-Day Preseason Practices: A Study from the NCAA-DoD CARE Consortium.

Stemper BD^{1,2,3}, Shah AS^{4,5}, Harezlak J⁶, Rowson S⁷, Duma S⁷, Mihalik JP⁸, Riggen LD⁶, Brooks A⁹, Cameron KL¹⁰, Giza CC¹¹, Houston MN¹⁰, Jackson J¹², Posner MA¹⁰, McGinty G¹², DiFiori J¹³, Broglio SP¹⁴, McAllister TW¹⁵, McCrea M^{4,5};

Repetitive head impact exposure sustained by athletes of contact sports has been hypothesized to be a mechanism for concussion and a possible explanation for the high degree of variability in sport-related concussion biomechanics. In an attempt to limit repetitive head impact exposure during the football preseason, the NCAA eliminated two-a-day practices in 2017, while maintaining the total number of team practice sessions. The objective of this study was to quantify head impact exposure during the preseason and regular season in Division I college football athletes to determine whether the 2017 NCAA ruling decreased head impact exposure. 342 unique athletes from five NCAA Division I Football Bowl Subdivision (FBS) programs were consented and enrolled. Head impacts were recorded using the Head Impact Telemetry (HIT) System during the entire fall preseasons and regular seasons in 2016 and 2017.

Despite the elimination of two-a-day practices, the number of preseason contact days increased in 2017, with an increase in average hourly impact exposure (i.e., contact intensity), resulting in a significant increase in total head impact burden (+ 26%) for the 2017 preseason.

This finding would indicate that the 2017 NCAA ruling was not effective at reducing the head impact burden during the football preseason. Additionally, athletes sustained a significantly higher number of recorded head impacts per week (+ 40%) during the preseason than the regular season, implicating the preseason as a time of elevated repetitive head impact burden. With increased recognition of a possible association between repetitive head impact exposure and concussion, increased preseason exposure may predispose certain athletes to a higher risk of concussion during the preseason and regular season. Accordingly, efforts at reducing concussion incidence in contact sports should include a reduction in overall head impact exposure.

32 A. KNEE/ACL**Meniscal tear repair**

Original Article

Influence of Medial Meniscus Bucket-Handle Repair in Setting of Anterior Cruciate Ligament Reconstruction on Tibiofemoral Contact Mechanics: A Biomechanical Study

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<https://doi.org/10.1016/j.arthro.2019.03.052> Get rights and content

Purpose

To compare the impact of an inside-out repair versus meniscectomy of a medial meniscus bucket-handle tear in restoring native contact areas and pressures across the tibial plateaus in the setting of an anterior cruciate ligament (ACL) reconstruction (ACLR).

Methods

Ten fresh-frozen cadaveric knees were tested in 6 knee conditions (1: intact; 2: ACL torn and bucket-handle tear of medial meniscus, flipped; 3: bucket-handle tear of medial meniscus, reduced; 4: bucket-handle tear of medial meniscus, repaired via inside-out vertical mattress suture technique; 5: ACLR with bone patella tendon bone autograft and bucket-handle repair; 6: ACLR and medial meniscus bucket-handle tear debridement) at 4 flexion angles (0°, 30°, 45°, and 60°), under a 1,000-N axial load. Contact area and pressure were measured with Tekscan sensors.

Results

ACLR with a concurrent medial meniscectomy for a medial meniscus bucket-handle tear resulted in significantly decreased contact area ($P < .05$) and increased mean and peak pressure in both the medial and lateral compartments across all tested flexion angles ($P < .05$). The ACLR with medial meniscectomy state also demonstrated significantly lower contact area than the bucket-handle repair state between 30° and 60° of flexion (all $P < .05$).

Conclusions

Resection of a bucket-handle medial meniscus tear concurrent with an ACLR resulted in significant increases in mean and peak contact pressures in not only the medial but also the lateral compartment. Preservation of the medial meniscus in the face of a bucket-handle tear is essential to more closely restore native tibiofemoral biomechanics.

Clinical Relevance

The increased mean and peak tibiofemoral contact pressure seen with excision of a bucket-handle medial meniscus tear would over time result in increased cartilaginous degradation and resultant osteoarthritis. Decreasing both of these factors through concomitant ACLR and inside-out bucket-handle meniscal repair should improve patient outcomes by restoring knee biomechanics and kinematics closer to that of the native state.

33. MENISCUS

Meniscal allograft

Original Article

Meniscal Allograft Transplantation Is an Effective Treatment in Patients Older Than 50 Years but Yields Inferior Results Compared With Younger Patients: A Case-Control Study

panel Prof. Stefano Zaffagnini M.D.^a Alberto Grassi M.D.^a Luca Macchiarola M.D.^a Federico Stefanelli M.D.^a Vito Cocco M.D.^a Prof. Maurilio Marcacci M.D.^c Luca Andriolo M.D.^a Giuseppe Filardo M.D., Ph.D.^b

<https://doi.org/10.1016/j.arthro.2019.03.048> Get rights and content

Purpose

To evaluate the influence of age on midterm clinical outcomes and failures of meniscal allograft transplantation (MAT), aiming at investigating the efficacy of MAT in patients older than 50 years.

Methods

In this case-control study, data on patients older than 50 years (older MAT [O-MAT] group) with at least 5 years of follow-up and a matched-pair group of patients younger than 30 years of age (younger MAT [Y-MAT] group) were extracted from a database of MAT procedures, performed with arthroscopic implantation of fresh-frozen meniscal allograft without bone plugs.

Results

A matched-pair comparative analysis of midterm results and survival between 26 O-MAT patients and 26 Y-MAT patients was performed at a mean follow-up of 7.3 ± 2.2 years. All the clinical scores significantly improved from the baseline values in both the O-MAT and Y-MAT groups although with significantly lower scores in the O-MAT group. Two-thirds of O-MAT patients were able to return to a recreational level of sports activity. Only 2 patients in the O-MAT group underwent knee replacement, but the overall failure rate, also considering a clinical criterion, was 31% in the O-MAT group and 15% in the Y-MAT group ($P = .3244$). The mean survival time free from replacement or graft removal was 11.6 years in the O-MAT group and 12.3 years in the Y-MAT group ($P = .691$).

Conclusions

MAT is able to provide symptom relief and functional improvement at midterm follow-up in patients older than 50 years although with inferior results and a higher failure rate compared with those younger than 30 years. MAT can be considered a viable option to treat patients older than 50 years.

34. PATELLA

Dislocations

Medicine (Baltimore). 2019 Jul;98(29):e16338. doi: 10.1097/MD.00000000000016338.

Surgical versus nonsurgical treatment of primary acute patellar dislocation: A systematic review and meta-analysis.

Yang F¹, Guo W², Wang Q³, Zhu Z², Guan C¹, Zhao S¹, Yuan B⁴.

BACKGROUND:

To systematically review the efficacy of surgical versus nonsurgical treatment for acute patellar dislocation.

MATERIALS AND METHODS:

PubMed, Cochrane, and Embase were searched up to February 12, 2019. After removing duplicates, preliminary screening, and reading the full texts, we finally selected 16 articles, including 11 randomized controlled trials and 5 cohort studies. The quality of the enrolled studies was evaluated by Jadad score or Newcastle-Ottawa scale. Meta-analyses were performed using odds ratio (OR) and standardized mean difference (SMD) as effect variables. The clinical parameters assessed included mean Kujala score, rate of redislocation, incidence of patellar subluxation, patient satisfaction, and visual analog scale (VAS) for pain. Evidence levels were determined using GRADE profile.

RESULTS:

The 16 included studies involved 918 cases, 418 in the surgical group and 500 in the nonsurgical group. The results of the meta-analysis showed higher mean Kujala score (SMD=0.79, 95% confidence interval [CI] [0.3, 1.28], P=.002) and lower rate of redislocation (OR=0.44, 95% CI [0.3, 0.63], P<.00001) in the surgical group than the nonsurgical group, but showed insignificant differences in the incidence of patellar subluxation (OR=0.61, 95% CI [0.36, 1.03], P=.06), satisfaction of patients (OR=1.44, 95% CI [0.64, 3.25], P=.38), and VAS (SMD=0.84, 95% CI [-0.36, 9.03], P=.84).

CONCLUSION:

For patients with primary acute patellar dislocation, surgical treatment produces a higher mean Kujala score and a lower rate of redislocation than nonsurgical treatment.

35. KNEE/TOTAL**Activity limitations****Higher activity level following total knee arthroplasty is not deleterious to mid-term implant survivorship**

Journal of Arthroplasty — Crawford DA, et al. | August 08, 2019

Through a retrospective review of 1,611 individuals (2,038 knees) who underwent total knee arthroplasty (TKA) with a 5-year minimum follow-up, researchers reported on implant survivorship and outcomes of high activity patients in comparison with low activity patients following TKA. Significantly more women patients, older with higher BMI, and lower functional scores preoperatively were observed in the low activity (LA) group. Significantly greater improvements in Knee society scores and pain following the operation was noted in the high activity (HA) group. In 4% and 1.7% knees of the LA group and of the HA group, respectively, revisions were done. A greater postoperative activity level continued to be an important factor for improved survivorship with an OR of 2.4, after controlling for age, gender, preoperative pain, KSC, KSF, and BMI. For the HA group and for the LA group, the all-cause 12-year survivorship was 98% and 95.3%, respectively. The aseptic 12-year survivorship was 98.4% and 96.3%, respectively, for the HA group and for the LA group.

Therefore, at 5-year minimum follow-up, in comparison with lower activity individuals following TKA, highly active individuals had progressed survivorship. Patient activity level following TKA may not require to be limited with modern implants.

59. PAIN**Sex differences**

Pain Pract. 2019 Aug 3. doi: 10.1111/papr.12827

An evaluation of sex differences in patients with chronic pain undergoing an interdisciplinary pain treatment program.

Racine M¹, Solé E^{2,3}, Sánchez-Rodríguez E^{2,3}, Tomé-Pires C^{2,3}, Roy R^{2,3}, Jensen MP⁴, Miró J^{2,3}, Moulin DE¹, Cane D⁵.

OBJECTIVES:

To determine if there are sex differences in a sample of patients participating in a 4-week interdisciplinary pain treatment in (1) pretreatment pain intensity, physical function, psychological function, pain beliefs, kinesiophobia, pain catastrophizing and activity management patterns; and (2) treatment response.

METHODS:

Seventy-two men and 130 women with chronic pain completed study measures. ANCOVAs were performed to compare men and women on pretreatment measures. Repeated-measures ANCOVAs were used to compare both sexes on three treatment outcomes (pain intensity, physical function and depressive symptoms).

RESULTS:

Before treatment, compared to women, men reported higher levels of kinesiophobia, were more likely to view their pain as being harmful, and used more activity pacing when doing daily activities. Women were more likely to use an overdoing activity pattern than men. No sex differences emerged for pretreatment pain intensity, physical function, psychological function, catastrophizing, activity avoidance or measures of other pain-related beliefs. At posttreatment, women reported more improvements in pain intensity and physical function compared to men, while both sexes reported similar reductions in depressive symptoms. All effect sizes for statistically significant findings were of small to moderate magnitude.

DISCUSSION:

This study suggests that men and women have a comparable profile with respect to the overall burden of chronic pain. Nevertheless, sex differences were found for certain pain beliefs and coping styles. Women appear to reap more benefits from the interdisciplinary pain management program than men. These findings indicate that further research to develop sex-specific assessment procedures and tailored pain treatments may be warranted. This article is protected by copyright. All rights reserved.

62 A. NUTRITION/VITAMINS**Vit D and Fx**

J Bone Miner Res. 2019 Jun 24. doi: 10.1002/jbmr.3818

Low Vitamin D Status Is Associated With Impaired Bone Quality and Increased Risk of Fracture-Related Hospitalization in Older Australian Women.

Zhu K^{1,2}, Lewis JR^{2,3,4}, Sim M^{2,3}, Prince RL^{1,2}.

The vitamin D debate relates in part to ideal public health population levels of circulating 25-hydroxyvitamin D (25OHD) to maintain bone structure and reduce fracture.

In a secondary analysis of 1348 women aged 70 to 85 years at baseline (1998) from the Perth Longitudinal Study of Aging in Women (a 5-year calcium supplementation trial followed by two 5-year extensions), we examined the dose-response relations of baseline plasma 25OHD with hip DXA BMD at year 1, lumbar spine BMD, and trabecular bone score (TBS) at year 5, and fracture-related hospitalizations over 14.5 years obtained by health record linkage. Mean baseline plasma 25OHD was 66.9 ± 28.2 nmol/L and 28.5%, 36.4%, and 35.1% of women had levels <50 , 50 to 74.9, and ≥ 75 nmol/L, respectively. Generalized additive models showed that total hip and femoral neck BMD and TBS, but not spine BMD, were higher with increasing plasma 25OHD up to 100 nmol/L. Compared with those with 25OHD <50 nmol/L, women with 25OHD ≥ 75 nmol/L had significantly higher total hip and femoral neck BMD at year 1 (3.3% to 3.9%) and TBS at year 5 (2.0%), all $P < 0.05$. During the follow-up, 27.6% of women experienced any fracture-related hospitalization and 10.6% hip fracture-related hospitalization. Penalized spline regression models showed a decrease in risk with increased 25OHD levels up to 65 nmol/L and 75 nmol/L for hip fracture and any fracture-related hospitalization, respectively. Cox regression grouped analyses showed that compared with women with 25OHD <50 nmol/L, those with 25OHD levels 50 to 74.9 and ≥ 75 nmol/L had significantly lower risk for hip fracture [HR 0.60 (95% CI, 0.40 to 0.91) and 0.61 (95% CI, 0.40 to 0.92), respectively], and any fracture-related hospitalization [HR 0.77 (95% CI, 0.59 to 0.99) and 0.70 (95% CI, 0.54 to 0.91), respectively].

In older white women, 25OHD levels >50 nmol/L are a minimum public health target and 25OHD levels beyond 75 nmol/L may not have additional benefit to reduce fracture risk.