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***Mustard CA and Yanar B. Estimating the financial benefits of employers' occupational health and safety expenditures. *Safety Science*. 2023; 159:106008.**

<https://doi.org/10.1016/j.ssci.2022.106008> [open access]

Abstract: While employer expenditures on occupational health and safety (OHS) in high income countries can be substantial, the financial benefits of these expenditures are not well described. The objective of this study is to apply a transparent methodology to estimate the financial return to employers from OHS expenditures in the Canadian province of Ontario. There were three phases in the study workplan: establishing an accurate estimate of the average direct cost of disabling work injury or illness; identifying employers in the construction, transportation and manufacturing sectors with a low incidence of work-related injury and illness; and the application of a set of plausible assumptions to estimate the financial benefits of OHS expenditures in this sample of employers with strong OHS performance. Financial benefits combined estimates of the tangible financial benefits arising from averted disabling work-related injury and illness and intangible financial benefits associated with improved employee retention and morale, improved production quality and strengthened corporate reputation. Applying these plausible assumptions, the average return on OHS expenditures was 1.24 for 289 manufacturing employers, 2.14 for 56 transportation employers and 1.34 for 88 construction employers. There was variation around these average return on investment values; 138 employers (32% of the sample) had an estimated return on investment less than 1.0, and 295 employers (68% of the sample) had a return on investment estimate greater than 1.0. The estimates of average financial return among large Ontario

employers in three important economic sectors, while moderate, are positive, in the range of 1.24 to 2.14. These estimates are consistent with the range of estimates available from research in this field over the past decade.

***Wieland LS, Skoetz N, Pilkington K, Harbin S, Vempati R, and Berman BM. Yoga for chronic non-specific low back pain. Cochrane Database of Systematic Reviews. 2022; 11:CD010671. <https://doi.org/10.1002/14651858.CD010671.pub3>**

Abstract: Background: Non-specific low back pain is a common, potentially disabling condition usually treated with self-care and non-prescription medication. For chronic low back pain, current guidelines recommend exercise therapy. Yoga is a mind-body exercise sometimes used for non-specific low back pain. Objectives: To evaluate the benefits and harms of yoga for treating chronic non-specific low back pain in adults compared to sham yoga, no specific treatment, a minimal intervention (e.g. education), or another active treatment, focusing on pain, function, quality of life, and adverse events. Search methods: We used standard, extensive Cochrane search methods. The latest search date was 31 August 2021 without language or publication status restrictions. Selection criteria: We included randomized controlled trials of yoga compared to sham yoga, no intervention, any other intervention and yoga added to other therapies. Data collection and analysis: We followed standard Cochrane methods. Our major outcomes were 1. back-specific function, 2. pain, 3. clinical improvement, 4. mental and physical quality of life, 5. depression, and 6. Adverse events: Our minor outcome was 1. work disability. We used GRADE to assess certainty of evidence for the major outcomes. Main results: We included 21 trials (2223 participants) from the USA, India, the UK, Croatia, Germany, Sweden, and Turkey. Participants were recruited from both clinical and community settings. Most were women in their 40s or 50s. Most trials used iyengar, hatha, or viniyoga yoga. Trials compared yoga to a non-exercise control including waiting list, usual care, or education (10 trials); back-focused exercise such as physical therapy (five trials); both exercise and non-exercise controls (four trials); both non-exercise and another mind-body exercise (qigong) (one trial); and yoga plus exercise to exercise alone (one trial). One trial comparing yoga to exercise was an intensive residential one-week program, and we analyzed this trial separately. All trials were at high risk of performance and detection bias because participants and providers were not blinded to treatment, and outcomes were self-assessed. We found no trials comparing yoga to sham yoga. Low-certainty evidence from 11 trials showed that there may be a small clinically unimportant improvement in back-specific function with yoga (mean difference [MD] -1.69, 95% confidence interval [CI] -2.73 to -0.65 on the 0- to 24-point Roland-Morris Disability Questionnaire [RMDQ], lower = better, minimal clinically important difference [MCID] 5 points; 1155 participants) and moderate-certainty evidence from nine trials showed a clinically unimportant improvement in pain (MD -4.53, 95% CI -6.61 to -2.46 on a 0 to 100 scale, 0 no pain, MCID 15 points; 946 participants) compared to no exercise at three months. Low-certainty evidence from four trials showed that there may be a clinical improvement with yoga (risk ratio [RR] 2.33, 95% CI 1.46 to 3.71; assessed as participant rating that back pain was improved or resolved; 353 participants). Moderate-certainty evidence from six trials

showed that there is probably a small improvement in physical and mental quality of life (physical: MD 1.80, 95% CI 0.27 to 3.33 on the 36-item Short Form [SF-36] physical health scale, higher = better; mental: MD 2.38, 95% CI 0.60 to 4.17 on the SF-36 mental health scale, higher = better; both 686 participants). Low-certainty evidence from three trials showed little to no improvement in depression (MD -1.25, 95% CI -2.90 to 0.46 on the Beck Depression Inventory, lower = better; 241 participants). There was low-certainty evidence from eight trials that yoga increased the risk of adverse events, primarily increased back pain, at six to 12 months (RR 4.76, 95% CI 2.08 to 10.89; 43/1000 with yoga and 9/1000 with no exercise; 1037 participants). For yoga compared to back-focused exercise controls (8 trials, 912 participants) at three months, we found moderate-certainty evidence from four trials for little or no difference in back-specific function (MD -0.38, 95% CI -1.33 to 0.62 on the RMDQ, lower = better; 575 participants) and very low-certainty evidence from two trials for little or no difference in pain (MD 2.68, 95% CI -2.01 to 7.36 on a 0 to 100 scale, lower = better; 326 participants). We found very low-certainty evidence from three trials for no difference in clinical improvement assessed as participant rating that back pain was improved or resolved (RR 0.97, 95% CI 0.72 to 1.31; 433 participants) and very low-certainty evidence from one trial for little or no difference in physical and mental quality of life (physical: MD 1.30, 95% CI -0.95 to 3.55 on the SF-36 physical health scale, higher = better; mental: MD 1.90, 95% CI -1.17 to 4.97 on the SF-36 mental health scale, higher = better; both 237 participants). No studies reported depression. Low-certainty evidence from five trials showed that there was little or no difference between yoga and exercise in the risk of adverse events at six to 12 months (RR 0.93, 95% CI 0.56 to 1.53; 84/1000 with yoga and 91/1000 with non-yoga exercise; 640 participants). Authors' conclusions: There is low- to moderate-certainty evidence that yoga compared to no exercise results in small and clinically unimportant improvements in back-related function and pain. There is probably little or no difference between yoga and other back-related exercise for back-related function at three months, although it remains uncertain whether there is any difference between yoga and other exercise for pain and quality of life. Yoga is associated with more adverse events than no exercise, but may have the same risk of adverse events as other exercise. In light of these results, decisions to use yoga instead of no exercise or another exercise may depend on availability, cost, and participant or provider preference. Since all studies were unblinded and at high risk of performance and detection bias, it is unlikely that blinded comparisons would find a clinically important benefit.

Bayram M, Arpat B, and Ozkan Y. Safety priority, safety rules, safety participation and safety behaviour: the mediating role of safety training. *International Journal of Occupational Safety & Ergonomics*. 2022; 28(4):2138-2148.

<https://doi.org/10.1080/10803548.2021.1959131>

Abstract: Objectives. This study explores the effects of employee perception of the management's safety priority, safety rules and safety training on safety participation and safety behaviour decided by management, as well as the mediating role of safety training on

the other four dimensions. **Methods.** The study covers employees working in 27 metal companies classed as hazardous/very hazardous in Turkey. The research data were collected by surveying 822 employees in the metal sector. Collected data were tested through explanatory and confirmatory factor analyses, in that order. **Results.** The findings of this analysis indicated statistically direct, positive effects of safety priority on safety rules and safety training, such an effect of safety rules on safety training, and again such effects of safety training on safety participation and safety behaviour. Besides, indirect relationships were detected between safety priority and safety rules and safety participation, and safety behaviour through the mediating role of safety training. **Conclusion.** Employee participation in health and safety issues as well as safe behaviour in the workplace depend on management prioritizing health and safety issues as much as production, formulating safe working rules, procedures and practices using comprehensive and regular training programmes

Cha EW, Jung SM, Lee IH, Kim DH, Choi EH, Kim IA, et al. Approval status and characteristics of work-related musculoskeletal disorders among Korean workers in 2020. *Annals of Occupational and Environmental Medicine*. 2022; 34:e31.

<https://doi.org/10.35371/aoem.2022.34.e31>

Abstract: BACKGROUND: This study aimed to investigate the characteristics of work-related musculoskeletal disorders (WRMSDs) in occupational disease claims and identify patterns of WRMSDs for each body part by industry and occupation. METHODS: This study analyzed the raw data of occupational disease claims for musculoskeletal disorders deliberated by the Occupational Disease Decision Committee of the Korea Workers' Compensation & Welfare Service in 2020. The data was classified into 6 body parts with the highest numbers of occupational disease cases by using the complete enumeration data on principal diagnoses and 4 types of subdiagnoses in the raw data. The characteristics and approval rates of WRMSDs by body part, industry and occupation were examined and summarized. RESULTS: A total of 13,015 occupational disease cases for WRMSDs were classified, and lumbar spinal (back) diseases accounted for the largest proportion of claimed diseases, followed by shoulder, elbow, wrist, knee, and neck diseases in a descending order. The occupations with the highest and second highest numbers of occupational disease cases by body part were found to be automobile assemblers and production-related elementary workers for the neck, school meal service workers and cooks for the back, construction frame mold carpenters and school meal service workers for the shoulder, elementary workers in mining and food service workers for the elbow, food service workers and automobile parts assemblers for the wrist, and ship welders and school meal service workers for the knee. CONCLUSIONS: This study examined the characteristics and approval status of WRMSDs by body part and occupation. Based on the study results, management strategies for the prevention of WRMSDs should be established regarding occupations with a high risk of WRMSDs for each body part

Clausen T, Rugulies R, and Li J. Workplace discrimination and onset of depressive disorders in the Danish workforce: a prospective study. *Journal of Affective Disorders*. 2022; 319:79-82.

<https://doi.org/10.1016/j.jad.2022.09.036> [open access]

Abstract: Objectives: Experiences of discrimination at work are a long-standing problem, but research on its mental health effect is sparse. The purpose of this study was to examine the prospective association between workplace discrimination and onset of depressive disorders among Danish workers. Methods: The prospective cohort study comprised 2157 workers, all free of depressive disorders at baseline. Using logistic regression models, we estimated the association between workplace discrimination at baseline and depressive disorders at 6-months follow-up, adjusted for demographics, health behaviors, job group, educational attainment and other psychosocial working conditions. Results: At baseline, 103 participants (4.8 %) reported workplace discrimination during the previous 12 months. Among the 103 exposed participants and the remaining 2054 unexposed participants, onset of depressive disorders during follow-up occurred in 16 (15.5 %) and 88 (4.3 %) participants, respectively. After adjustment for all covariates, the odds ratio was 2.73 (95 % confidence interval: 1.38-5.40) comparing exposed to unexposed participants. Limitations: All measures were self-reported, entailing risk of common methods bias, and we also cannot rule out selection bias. Conclusions: Exposure to workplace discrimination is a risk factor for onset of depressive disorders. Eliminating or reducing workplace discrimination may contribute to the prevention of depressive disorders in working populations.

Frandsen TF, Nielsen MFB, and Eriksen MB. Avoiding searching for outcomes called for additional search strategies: a study of Cochrane review searches. *Journal of Clinical Epidemiology*. 2022; 149:83-88.

<https://doi.org/10.1016/j.jclinepi.2022.05.015> [open access]

Abstract: OBJECTIVES: A search strategy for a systematic review that uses the Population, Intervention, Comparison, and Outcome framework should include the population, the intervention(s), and the type(s) of study design. According to existing guidelines, outcome should generally be excluded from the search strategy unless the search is multistranded. However, a recent study found that approximately 10% (51) of recent Cochrane reviews on interventions included outcomes in their literature search strategies. This study aims to analyze the alternatives to including outcomes in a search strategy by analyzing these recent Cochrane reviews. STUDY DESIGN AND SETTING: This study analyzes the 51 Cochrane reviews that included outcomes in their literature search strategies and analyzes the results of alternative search strategies that follow current recommendations. RESULTS: Despite a small study sample of 51 reviews the results show that many of the reviews excluded some of the recommended elements due to very broadly defined elements (e.g., all interventions or all people). Furthermore, excluding outcomes from the search strategy is followed by an enormous increase in the number of retrieved records making it unmanageable to screen, if

using a single-stranded search strategy. CONCLUSION: Recommendations for search strategies in difficult cases are called for

Hoertel N, Rico MS, Limosin F, Lemogne C, Alvarado JM, Goldberg M, et al. Retirement age does not modify the association of prior working conditions with self-rated health and mortality in retirees: results from a prospective study of retired French workers.

International Archives of Occupational & Environmental Health. 2022; 95(10):1921-1934.

<https://doi.org/10.1007/s00420-022-01886-0> [open access]

Abstract: OBJECTIVE: It is unclear whether retirement age can modify the association of working conditions with health and mortality in retirees who are no longer exposed to these conditions. METHODS: The present study investigated this issue in a cohort of 13,378 French workers in whom self-rated health and mortality were measured over 15 years after statutory retirement. The analyses were also performed in homogenous clusters of workers differentiated on the basis of working conditions, social position, birth and retirement years. RESULTS: Bad working conditions before retirement, which were assessed using a global score combining 25 different occupational exposures, were associated with higher rates of suboptimum self-rated health and mortality in retirees after adjusting for retirement age, social position, demographics and health status before retirement. These rates were also substantially higher in the cluster of workers characterized by bad working conditions in comparison to other clusters. In contrast, retirement age was not associated with self-rated health or mortality after adjusting for working conditions, social position, demographics and health status before retirement. Likewise, no association of retirement age with self-rated health or mortality was found in any cluster of workers and no interactions were observed with any of these clusters. CONCLUSION: These results suggest that bad working conditions before retirement have long-term detrimental effects on health and mortality in retirees and that retirement age does not modulate these effects. Improving work environment rather than modifying retirement age should be prioritized to promote health and reduce mortality not only in workers but also in retirees

Kyung M, Collman N, Domeracki S, Hong O, and Lee SJ. Racial and ethnic differences in the perceptions of health, work environment and experiences of work-related symptoms among cleaning workers. Journal of Immigrant & Minority Health. 2022; 24(6):1398-1407.

<https://doi.org/10.1007/s10903-022-01328-6> [open access]

Abstract: This study explored racial and ethnic differences in perception of work environment, safe work practices, general health status, experience of work-related injury or illness and subsequent symptom reporting and health care seeking behaviors among cleaning workers. This study analyzed cross-sectional data obtained from 183 cleaning workers employed in a university hospital or a health sciences campus in Northern California. The sample included 120 Asians (65.6%), 37 Hispanics (20.2%), and 27 other ethnicities (14.2%); 85.7% were foreign-born. Asian workers perceived lower job control and supervisor support and higher job strain than other workers. The odds of perceiving general health as excellent

or very good were lower among Asians compared to Hispanics and Others. Asians who experienced chemical-related symptoms were less likely than Hispanics and others to report the symptoms to their supervisor or seek healthcare. Our study findings indicated racial/ethnic differences in perceptions of work and general health, seeking healthcare, and reporting behaviors among cleaning workers. Asian workers, specifically, may need special attention to improve their experiences of work environments and health in the workplace

Lee KS, Lee DW, Park J, Kim HY, Yun JY, Hong YC, et al. Association between sickness presenteeism and depressive symptoms in Korean workers during the COVID-19 pandemic: a cross-sectional study. *Journal of Affective Disorders*. 2022; 319:344-351.

<https://doi.org/10.1016/j.jad.2022.09.029> [open access]

Abstract: Background: During the COVID-19 pandemic, Korean workers have reported various types of sickness presenteeism (SP: continuing to attend work during illness). Understanding SP through mental health perspectives will help to make practical strategy for better working conditions. We examined the association between SP and depression among Korean workers during the COVID-19 pandemic in relation with the socioeconomic and lifestyle factors.

Methods: Data from the 2020 Korean Community Health Survey were used as a representative nationwide sample dataset. We surveyed the experience of depression in the last two weeks from individuals who worked more than a week recently. We investigated the associations between SP and depressive symptoms. Depressive symptoms were scored using the Patient Health Questionnaire-9 (PHQ-9). Logistic regression analysis was performed to examine the significance of the associations. **Results:** Analysis of the data obtained from 84,514 participants revealed that 1700 (2.2 %) participants reported experiencing depressive symptoms in 2020. Employees with SP showed higher association with depressive symptoms than employers or self-employed individuals (OR = 2.18, 95 % CI: 1.85, 2.56 among employees vs. OR = 1.76, 95 % CI: 1.29, 2.40 among employers or self-employed individuals). **Conclusion:** SP has become more prominent during the COVID-19 pandemic. A protective strategy against SP among vulnerable workers is necessary for a healthier and safer society.

Liu Y, Zou L, Yan S, Zhang P, Zhang J, Wen J, et al. Burnout and post-traumatic stress disorder symptoms among medical staff two years after the COVID-19 pandemic in Wuhan, China: social support and resilience as mediators. *Journal of Affective Disorders*. 2023; 321:126-133.

<https://doi.org/10.1016/j.jad.2022.10.027> [open access]

Abstract: Background: Evidence on the relationship between burnout and post-traumatic stress disorder (PTSD) is limited. We aimed to evaluate the association between burnout and PTSD symptoms among medical staff two years after the coronavirus disease 2019 (COVID-19) pandemic in Wuhan, China, and explore the mediating roles of social support and psychological resilience. **Methods:** A multicenter survey was conducted online from January to March 2022 among healthcare professionals from six general hospitals. Hierarchical linear regression was used to detect the predictors of PTSD symptoms. Structural equation

modeling (SEM) was used to analyze the pathways from burnout to PTSD symptoms. Results: Hierarchical linear regression showed that burnout, social support, and psychological resilience were significant predictors of PTSD symptoms among medical staff. In the SEM, the standardized total effect of burnout on PTSD symptoms was 0.336(bias-corrected 95 % confidence interval [0.303, 0.367], $P < 0.001$). Social support and psychological resilience partially mediated the relationship between burnout and PTSD symptoms (indirect effects accounted for 22.3 % of the total effect). Limitations: Owing to the cross-sectional design, only clues to causal explanations can be provided. Conclusions: Burnout has significant direct and indirect effects on PTSD symptoms. Furthermore, social support and psychological resilience might be effective ways to reduce the impact of burnout on PTSD symptoms in medical staff after a major public health outbreak.

O'Donnell L, Helmuth M, Williams S, McInnis MG, and Ryan KA. Predictors of employment status and stability in Bipolar Disorder: findings from an 8-year longitudinal study. *Journal of Affective Disorders*. 2023; 321:1-7.

<https://doi.org/10.1016/j.jad.2022.09.095>

Abstract: Introduction: Understanding how Bipolar Disorder (BD) affects employment is limited by cross-sectional or short-term longitudinal designs. The aims for this study are to examine condition-related and other clinical predictors of longitudinal employment status and stability in those with BD compared to healthy controls (HC). Methods: Participants were 358 individuals with BD and HC who were enrolled in the Heinz C. Prechter Longitudinal Study of BD. Participants completed self-report measurements of employment, symptoms, health, personality, life events, and neuropsychological tests at study enrollment, yearly and/or every two months. Repeated measures logistic regression was used to predict employment status and stability. Results: Those with BD were less likely to be employed than HC. Significant predictors of unemployment in BD include having BD type I, younger age, less years with BD, higher depression, worse processing speed, and worse mental and physical health. Of those with BD, 64 % demonstrated greater employment instability compared to 37 % of HC. History of psychosis, worse memory, physical health, and greater disruption of negative life events significantly predicted employment instability. Limitations: The limitations of this study include the generalizability of this sample, a large reliance of self-report measures, and a lack of employment-related factors such as job-type, functioning, performance, and satisfaction. Lastly, the effects of medication, treatment adherence, and treatment optimization were not assessed in this study. Conclusions: These findings highlight that different aspects of BD are important for being employed versus maintaining stable employment. These findings indicate the need for more effective treatment strategies beyond symptom management.

Pejtersen JH and Holt H. Literacy and risk of occupational injury. *International Archives of Occupational & Environmental Health*. 2022; 95(10):1971-1978.

<https://doi.org/10.1007/s00420-022-01898-w>

Abstract: OBJECTIVE: We examined whether low literacy skills are a risk factor for occupational injury during a 5.3-year follow-up period. METHODS: The study population was taken from the Danish participants in the Programme for the International Assessment of Adult Competencies (PIAAC) in 2011/2012. Literacy skills were based on the PIAAC survey. Data on occupational injuries were obtained from national registers. We included the 5997 employees aged 16-65 who worked during the follow-up period. We used Cox regression to estimate the risk of occupational injury as a function of literacy skills. We adjusted the analysis for gender, age, nationality at birth, educational level, occupation, weekly work hours and month of survey completion. RESULTS: Literacy skills were divided into four categories based on the six levels of skills in PIAAC. With the highest level of literacy skills as the reference (level 4/5), the hazard ratios for occupational injury were estimated at 1.58 (95% CI 0.80-3.15) for literacy level 3, 2.04 (95% CI 0.99-4.19) for literacy level 2 and 2.29 (95% CI 1.08-4.86) for literacy level 0/1. CONCLUSION: Employees with a low level of literacy skills are at a higher risk of occupational injury than employees with a high level of literacy skills

Vleeshouwers J, Flovik L, Christensen JO, Johannessen HA, Bakke Finne L, Mohr B, et al. The relationship between telework from home and the psychosocial work environment: a systematic review. International Archives of Occupational & Environmental Health. 2022; 95(10):2025-2051.

<https://doi.org/10.1007/s00420-022-01901-4> [open access]

Abstract: OBJECTIVE: Telework from home (TWFH) has become routine for many, yet research on how this may affect the psychosocial work environment is sparse. To understand the effects that TWFH may have on the psychosocial work environment, this systematic literature review identified, evaluated, and summarized findings on the association of TWFH with factors of the psychosocial work environment. METHODS: Searches were conducted in MEDLINE, Embase, Amed, PsycINFO, and PubMed. The topic of the study reflected TWFH, and subjects should be office workers employed at a company. Outcomes should reflect psychosocial work environment factors. Inclusion criteria stated that studies should be primary, quantitative, and published in a peer-reviewed journal. English language publications dating from January 2010 to February 2021 were included. Risk of bias was assessed using the Newcastle-Ottawa scale (NOS) and quality of overall evidence using Grading of Recommendations Assessment, Development and Evaluation (GRADE). RESULTS: Searches resulted in 3354 publications, and after screening rounds 43 peer-reviewed original studies satisfying predetermined inclusion and exclusion criteria were included. Fourteen individual psychosocial work environment outcome categories were studied. Limited overall evidence to support effects of TWFH on the included work environment outcomes, with evidence being rated either of low or very low quality. Flexibility and autonomy are discussed as potential mediating variables in the relationship between TWFH and the psychosocial work environment. CONCLUSION: There is a lack of high-quality research investigating effects of TWFH on the psychosocial work environment. To suggest TWFH guidelines or



recommendations, there is a need for research with high-quality longitudinal designs, precise measures of time use and location of work, and validated measures of factors known to be of importance. PROSPERO registration number CRD42021233796

Ward KL and Smith M. Association between chiropractic utilization and opioid prescriptions among people with back or neck pain: evaluation of the medical expenditure panel survey. *Journal of Manipulative and Physiological Therapeutics*. 2022; 45:315-322.

<https://doi.org/10.1016/j.jmpt.2022.08.003>

Abstract: **OBJECTIVE:** The purpose of this study was to assess the association between patients in the United States seeing a chiropractor and receiving an opioid prescription for back or neck pain. **METHODS:** Medical Expenditure Panel Survey (Years 2012 to 2015) respondents for longitudinal panels 17 to 19 who participated in all 5 rounds were at least 18 years of age, did not have cancer, and reported back or neck pain. We defined chiropractic users as participants reporting at least 1 chiropractic visit for back or neck pain and opioid users as participants reporting purchase or receipt of a prescription classified as Multum Lexicon "60" and "191" for back or neck pain. We adjusted for socioeconomic and clinical variables using multiple logistic regression. **RESULTS:** The sample contained 4686 people, 21% of whom reported an opioid prescription for back or neck pain. Among opioid users, 14% reported a chiropractic visit for back or neck pain compared to 31% of nonopioid users. The adjusted odds ratio for chiropractic use among opioid users compared to nonopioid users was 0.46 (95% confidence interval, 0.36-0.57). **CONCLUSION:** Patients with back or neck pain who saw a chiropractor had approximately half the odds of reporting an opioid prescription compared to those who did not see a chiropractor

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