

Social Influences on Peer Judgements about Chronic Pain and Disability

Running head: Peer Judgement about Chronic Pain

Tracy M. Anastas^a, BA, Samantha M. Meints^{b,c}, PhD, Ari D. Gleckman^d, PhD, Adam T. Hirsh^a, PhD

Institutional affiliations:

^aDepartment of Psychology, Indiana University–Purdue University Indianapolis

^bDepartment of Anesthesiology and Pain Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA

^cOrthopaedic and Arthritis Center for Outcomes Research, Department of Orthopaedic Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, MA

^dIndiana Poly Clinic, Indianapolis, IN

Corresponding author:

Adam Hirsh, PhD

402 N Blackford St.

LD124

Indianapolis, IN 46202

Phone: (317) 274-6942

Fax: (317) 274-6756

Email: athirsh@iupui.edu

Highlights

- Social factors influence peer judgements about pain and disability.
- Patient weight, fault of accident, and job physicality were independent predictors.
- Patients who have applied for disability themselves rated peers as more disabled.

Disclosures: This study was supported in part by the National Institutes of Health (T32 AR055885) and the Psychology Department at Indiana University-Purdue University Indianapolis. This research was previously presented at the 2016 Scientific Meeting of the American Pain Society. The authors have nothing to disclose. We confirm that there are not any

This is the author's manuscript of the article published in final edited form as:

Anastas, T. M., Meints, S. M., Gleckman, A. D., & Hirsh, A. T. (2018). Social Influences on Peer Judgements about Chronic Pain and Disability. *The Journal of Pain*. <https://doi.org/10.1016/j.jpain.2018.12.006>

closely related manuscripts that have been submitted for simultaneous consideration to the same or another journal. There are no conflicts of interest that might be seen as influencing or prejudicing the research.

Abstract

Chronic pain is a leading cause of work absenteeism and disability compensation.

Previous work demonstrates that patients with chronic illness often seek advice, such as whether or not to pursue disability benefits, from peers with similar health conditions. The current study examined the extent that social factors influence patients with chronic pain (“peers”) when making disability judgements and recommendations for other patients with chronic pain. Participants (n=71) made pain-related and disability ratings for fictional vignette patients that varied in weight (normal vs. obese), fault of accident, and physical work demands. Results of repeated-measures ANOVAs indicated that participants rated patients with obesity, who were not at-fault, and who held a physically demanding job as experiencing more severe pain symptoms and disability and were more likely to recommend they seek disability benefits. Participants who had applied for disability benefits themselves rated patients as more disabled than participants who had not applied for disability. These data suggest that patients with chronic pain are influenced by patient and contextual factors when making pain-related and disability judgements for peers. These judgements may impact patient decision making via peer support programs and online forums.

Perspective: This study suggests that patients with chronic pain are influenced by patient weight, fault of accident, and physical work demands when making judgements about pain and disability

for peers. Future studies should examine the extent such peer-to-peer recommendations influence actual disability-seeking behaviors for pain.

Keywords: chronic pain, disability, peer recommendations, pain assessment, obesity

Introduction

Chronic pain is a leading cause of decreased work productivity and absenteeism.^{37, 40} This lost productivity is estimated to cost the US upwards of \$355 billion annually.²¹ Nearly 40% of individuals with chronic pain report that pain negatively impacts their job, such that they take more sick days, arrive late or leave early, and distribute work to colleagues.³³ Furthermore, patients with chronic pain receive \$18.9 billion annually in disability compensation.²¹

Previous work has shown that patients facing medical decisions, such as whether or not to pursue disability benefits, frequently seek information and advice from peers with similar health conditions.^{11, 12} Indeed, evidence-based peer support groups are increasingly being incorporated into healthcare systems, and they are associated with improved patient outcomes.^{1, 43} Online forums are another common platforms for peer-to-peer exchanges.^{10, 12, 39} These exchanges may influence patients with chronic pain when making medical decisions, including whether or not to seek disability compensation. Although factors that influence peers' perspectives and recommendations have not been identified, some putative patient and contextual factors are suggested by prior studies with providers and unaffiliated laypeople.^{4, 24, 26}

Patient weight is one factor that might influence peer-to-peer advice about pain-related disability. In one study, medical students rated simulated patients with chronic pain and obesity as less compliant, less intelligent, and less attractive than normal weight patients.⁴⁴ These results are striking given the high prevalence of pain and disability among people with obesity.^{25, 28, 30, 35}

Healthcare professionals also tend to view obesity as a problem of self-control, motivation, and compliance,³ casting blame upon patients for their weight and associated health problems. Relatedly, Marteau and Riordan³¹ found that health professionals have more negative attitudes toward patients perceived as responsible for becoming ill (i.e., not undertaking relevant health behaviors). Thus, another patient-contextual factor that might influence peers' judgements is perceived responsibility or fault. In a vignette study, Tait and Chibnall⁴² manipulated patient control over (i.e., responsibility for) their pain condition. Patients with low responsibility (i.e., pain due to arthritis) were perceived as having more emotional distress and intense pain than those with high responsibility (i.e., pain due to a patient-caused automobile accident). However, a follow-up study did not find a significant main effect of patient control on observers' pain-related judgements.⁷ A third factor that may influence peers' pain-related judgements is physical work demand relative to an individual's physical capabilities.^{8, 17, 36} One study found that physicians were more certain about assigning disability when patients had a history of heavy physical labor,⁵ and another found that occupational physical demands predicted return-to-work status.⁹ Collectively, these studies suggest that perceptions about the physical nature of work may influence judgements about pain and disability among peers.

To our knowledge, no study has investigated the extent that patient and contextual factors influence patients with chronic pain when making pain and disability judgements for other patients with pain (i.e., peer judgements). Given the high rates of disability among patients with chronic pain and its high cost to patients and society, it is important to better understand factors influencing patients' decisions to seek disability benefits. To address this gap, we examined the impact of hypothetical patients' weight, fault of accident, and physical work demands on pain-related and disability judgements of study participants ("peers") who were actual patients with

chronic pain. We hypothesized that participants would rate patients with obesity (vs. normal weight), patients who were at-fault (vs. not at-fault), and patients with sedentary jobs (vs. physically demanding jobs) as having less severe pain symptoms and disability and would be less likely to recommend they seek disability benefits. Lastly, we explored the relationships between participant characteristics (e.g., age) and their pain-related judgements.

Methods

Participants

Participants were recruited from a free-standing interdisciplinary pain clinic in the Midwest. Recruitment occurred over four consecutive days in 2015. Patients who attended the clinic during this time were invited to participate. Eligible participants were at least 18 years old, English-speaking, and without significant cognitive impairment. All participants endorsed having chronic pain. We recruited 75 participants. Four participants had substantial missing data and, thus, were removed from analyses, yielding a final sample of 71 participants (68% female, mean age = 51.6 years [SD = 11.3]). Approximately 84% self-identified as White, 14% as Black, 1% as Native American, and 1% as other. Eighty-three percent of participants were identified as having overweight or obesity according to the body mass index (BMI) standards established by the Centers for Disease Control and Prevention,⁶ and 40% reported currently receiving disability compensation. Most participants reported more than one pain condition (75%), including chronic back pain (77%), arthritis (62%), headache/migraine (44%), neuropathic pain (30%), and fibromyalgia (29%).

Study Design and Procedures

We investigated three patient cues in the Disability Judgement Task: weight (obese vs. normal), fault of injury (at-fault vs. not at-fault), and job physicality (physical vs. sedentary). Eight unique patient profiles were needed to represent each possible cue combination (2 levels of weight X 2 levels of fault X 2 levels of job physicality = 8). To enhance the reliability of the decision-making data and maximize statistical power, we created vignettes for 16 unique hypothetical patients so that each cue combination was presented twice to each study participant.

Each vignette described a hypothetical patient presenting with chronic low back pain of moderate-to-severe intensity resulting from an injury (patient at-fault vs. not at-fault). The patient was described as having pain-related impairments in physical function (e.g., walks slowly, has difficulty transitioning from sitting to standing). The patient's pain had reportedly not improved in the prior 18 months, and despite an attempt to return to work (to a sedentary job vs. physically demanding job), the patient could not complete work duties and stopped working after one month. The vignette listed several treatments that the patient had tried (e.g., analgesic medications, acupuncture, physical and occupational therapy). Lastly, the vignette included the patient's BMI (normal vs. obese), vital signs, neurological examination findings (all within normal limits), and results of an MRI suggesting a bulging disc. In accord with expert recommendations¹⁵ and consistent with numerous prior vignette-based studies from our research group,^{12,29-34} several non-essential details of the text vignettes were varied across patients (e.g., name, vital signs within normal limits); however, apart from the three cues of interest (weight, fault, job), the information was equivalent for all patients. A sample patient text vignette (obese, at-fault, physically demanding job) is presented below with parenthetical content representing information for a counterpart patient (normal weight, not at-fault, sedentary job).

Height: 5'11 [5'6] Weight: 244 [136] lbs. BMI: 34 [24] (Obese) [(Normal)]

BP: 116/75

Pulse: 71

Mental Status: Alert and Oriented

A 46-year-old groundskeeper [attorney] presents with a complaint of low back pain since running a stop sign and causing a motor vehicle accident [falling down the stairs]. The patient describes the back pain as moderate to severe, without improvement for the last 18 months. This patient has tried several treatments but has not found relief in any of them; these treatments included meditation, multiple types of pain medication, and physical and occupational therapy. The patient has difficulty standing and walking. The patient's vital signs and neurological exam are both normal. A recent MRI of the spine showed a bulging disc. The patient went back to work 4 months after the accident, but stopped within 1 month, unable to complete work duties due to the pain.

After providing informed consent, participants completed a demographic questionnaire. Next, participants read instructions about how to complete the Disability Judgement Task and make decisions for the patient vignettes. For each of the 16 patients, participants rated the patient's pain symptom severity, level of disability, and the likelihood they would recommend the patient seek disability compensation. The study took approximately 45 minutes to complete, and participants were compensated with \$10. Study procedures were approved by the IUPUI institutional review board.

Measures

Demographics questionnaire: Participants provided information about their sex, age, race/ethnicity, disability claim status, chronic pain diagnoses, and height and weight (for computing BMI).

Disability judgements: For each of the 16 vignette patients, participants were asked to “Please rate the severity of the patient’s symptoms” from 0 (very mild) to 100 (extremely severe), “How disabled do you think this patient is?” from 0 (not at all disabled) to 100 (very disabled), and “How likely would you be to recommend this patient seek disability compensation such as Social Security Disability?” from 0 (not at all likely) to 100 (very likely). Participants placed vertical marks that best represented each of their ratings on three 100mm horizontal visual analog scales (VASs), with each millimeter corresponding to a one-unit increase on the VAS.

Data Analysis

Because each cue combination was presented twice, participants’ ratings were averaged for each judgement for both patient vignettes that represented the same cue combination. Thus, for each of the 8 cue combinations, participants had single (averaged) ratings for symptom severity, disability level, and disability compensation. Bivariate correlations among the three outcome variables are presented in Table 1. To examine the effects of weight, fault, and job physicality, we used a series of 2 (weight: obese vs. normal) X 2 (fault: at-fault vs. not at-fault) X 2 (job physicality: physical vs. sedentary) repeated measures analyses of variances (rANOVAs).

To examine the relationship between participant characteristics and their judgement ratings, we ran a series of independent samples t-tests comparing average ratings for symptom severity, disability level, and disability compensation across participant sex and disability application status (has applied for disability compensation vs. not). Additionally, we calculated the bivariate correlations between participants’ BMI and age with their average judgement ratings.

Results

Effects of Social Factors on Disability Judgements

Symptom severity

The main effects of patient weight ($F(1,70)=4.18, p<.05, \eta_p^2=.06$), fault ($F(1,70)=10.10, p<.01, \eta_p^2=.13$), and job physicality ($F(1,70)=15.00, p<.01, \eta_p^2=.18$) on symptom severity ratings were significant. Participants ascribed more severe symptoms to patients with obesity, who were not at-fault for their injury, and who held a physically demanding job compared to patients who were normal weight, were at-fault for their injury, and held a sedentary job, respectively (see Table 2). There were no significant two-way interactions (all $ps>.05$).

Disability

The main effects of patient weight ($F(1,70)=5.17, p<.05, \eta_p^2=.07$), fault ($F(1,70)=25.23, p<.01, \eta_p^2=.27$), and job physicality ($F(1,70)=20.41, p<.01, \eta_p^2=.23$) on disability level ratings were significant. Participants rated patients with obesity, who were not at-fault for their injury, and who held a physically demanding job as more disabled compared to patients who were normal weight, were at-fault for their injury, and held a sedentary job, respectively (see Table 2). There were no significant two-way interactions (all $ps>.05$).

Disability compensation recommendations

The main effects of patient weight ($F(1,70)=7.29, p<.05, \eta_p^2=.09$), fault ($F(1,70)=18.08, p<.01, \eta_p^2=.21$), and job physicality ($F(1,70)=17.43, p<.01, \eta_p^2=.20$) on recommendations to seek disability compensation were significant. Participants were more likely to make this recommendation to patients with obesity, who were not at-fault for their injury, and who held a physically demanding job compared to patients who were normal weight, were at-fault for their

injury, and held a sedentary job, respectively (see Table 2). There were no significant two-way interactions (all $ps > .05$).

Effects of Participant Factors on Disability Judgements

Results of independent samples t-tests indicated that compared to participants who had not applied for disability compensation, those who had applied rated patients as more disabled ($t(63) = -2.15, p < .05, d = .53$; see Table 3). However, there were no significant differences in pain symptom severity rating or likelihood of recommending patients seek disability compensation between participants who had and had not applied for disability compensation (all $ps > .05$). Further, there were no significant sex differences in participants' ratings ($ps > .05$). Results of bivariate correlation analyses indicated that participant age and BMI were not significantly related to their pain or disability judgements (see Table 1).

Discussion

Patients view medical decision making as an ongoing process that occurs within their social context.²⁰ Although peer-to-peer exchanges are common in this context, factors that influence peers when making pain- and disability-related recommendations are largely unknown. We found that participants rated patients with obesity, who were not at-fault, and who held physically demanding jobs as experiencing more severe pain symptoms and disability and were more likely to recommend they seek disability benefits than patients who did not have obesity, who were at-fault, and held sedentary jobs, respectively.

Our findings that patients who were at-fault and had sedentary jobs were rated lower on pain symptomology and disability and were less likely to be recommended to seek disability benefits were consistent with our hypotheses and previous literature. Moreover, the effect sizes

for patient fault and job physicality on participants' judgements, particularly judgements about disability symptoms and benefits, were large. These results are congruent with a study by Tait and Chibnall,⁴² which found that laypersons perceived patients with higher responsibility for their pain (i.e., patient-caused accident) as having less emotional distress and intense pain. Our results also align with research showing that healthcare professionals have less positive feelings toward patients whom they perceive as being responsible for their condition,³¹ as well as with studies demonstrating that occupational physical demands are taken into consideration when determining disability status such that disability is more readily assigned when demands are high.⁵

Participants rated patients with obesity higher on pain symptomology and disability and were more likely to recommend they seek disability benefits. These results did not align with our hypotheses. Previous work has demonstrated that laypersons and health professionals perceive patients with obesity as lacking self-control, motivation, and compliance behaviors;⁴⁴ thus, we hypothesized participants would "blame" patients with obesity for their weight and pain problems, which would likely manifest in lower ratings of symptom severity and disability recommendation. One potential explanation for these unexpected results is that participants may have been aware that obesity is associated with increased pain and disability.^{25, 28, 30, 35} Such awareness is plausible given that 83% of our sample was classified as having overweight or obesity. Moreover, having experienced the challenges of overweight/obesity while managing chronic pain themselves, these participants may have been more empathic toward hypothetical patients with obesity instead of blaming them for their condition. Although significant, it is important to note that the effects of patient weight on participants' judgements were smaller in magnitude than the effects of patient fault and job physicality.

Our findings have important practical implications given that peer support platforms are increasingly being incorporated into healthcare and used by patients. Patients with chronic pain seek peer support for empathy, to learn new self-management strategies, and to improve their quality of life.^{18, 41} In evidence-based structured support groups, peer “supporters” receive training in pain-related psychoeducation, self-management, and goal setting, which they disseminate in individual or group settings. For instance, in a pilot study of a VA-based peer support program that included the above-mentioned topics plus motivational interviewing, peer supporters met individually with patients at least twice per month. This program was associated with decreased pain severity and interference, although the results were not statistically significant.³² Participants also reported that it enhanced their motivation and self-management.¹ In a different trial involving non-VA primary care patients, a peer-led group was associated with increased self-management attitudes and decreased worry and physical disability.⁴³ These promising results notwithstanding, our results suggest that it is important for program developers to be aware of peer biases when designing and implementing structured peer support programs. To ensure program fidelity, training and supervision for peer supporters may need to include bias-awareness education and discussion of how these biases may influence support activities.

Many peer-to-peer interactions also occur informally, outside of structured programs and without health professional leadership. A consumer-led pain support group in New Zealand included guest speakers, pain management resources, and general social opportunities. Participants reported that the group enhanced their sense of belonging, increased their motivation for positive health behaviors, improved their functioning, and led to decreased healthcare utilization.⁴¹ Many patients also participate in online health forums that are open to the public.^{13, 14, 19} Although these and other online resources provide a convenient and affordable way to

obtain information, the quality varies.² One study found that in an online forum for painful arm/hand conditions, nearly 90% of messages offering medical information came from non-healthcare professionals, and over half of these messages conveyed information based on personal experience rather than empirical evidence.¹⁰ When applied to informal support groups and online forums, the results of the current study suggest that peers may be unduly influenced by their own biases about and experiences with pain and disability when making recommendations to others. Study participants who had applied for disability were more likely to view patients as disabled compared to participants who had not applied. Thus, the experience of applying for disability oneself may alter perceptions of pain and disability in others. Combined, prior studies and our results indicate that providers should be aware that patients are likely exposed to inaccurate and biased information from other patients with pain, and this exposure can occur via in-person and online interactions. Educating patients about the potential pitfalls of such exchanges may help mitigate any associated harm stemming from peer-to-peer support. These discussions may be particularly relevant when recommending patients seek social support, which in general is associated with positive pain-related outcomes,^{16, 27} although some studies have linked it to adverse outcomes, such as increased pain catastrophizing and disability.^{29, 38}

The current study has several strengths and limitations. To our knowledge, it is one of the first studies to investigate peer judgments in the context of pain and disability. This is an important area of inquiry given the high cost and consequences of pain-related disability, and also because patients with chronic pain are likely to be especially motivated to seek peer support and advice. We identified three social influences that appear to be relevant to peer judgements about pain and recommendations for disability compensation. These results provide a good starting point for future studies in this area. Another strength of this study is our use of clinical

vignettes, which enhanced experimental control and, thus, the internal validity of the findings. Several study limitations should also be noted. The sample was obtained from one multidisciplinary pain clinic in the Midwest; thus, caution is in order when generalizing findings to other geographical and clinical settings. Additionally, due to the setup of the clinic, we were unable to ensure that every patient who attended clinic on recruitment days was invited to participate. We were also unable to collect data on participants who declined (due to IRB regulations), and for those participants who did participate, we did not collect extensive data about their medical or psychosocial history (to minimize the amount of sensitive and personally identifiable data). Thus, we could not determine whether these and other factors influenced participants' judgements. The majority of participants were White, middle-aged, women. Although these sample demographics are consistent with the entire patient pool attending the clinic, our findings may not be generalizable to more diverse samples. Future research should consider the impact of race and age on pain judgements and disability recommendations; these demographic variables, along with other patient factors, such as psychological symptoms and socioeconomic status, may prove to be additionally important contributors to peer judgements about pain. Further, study stimuli were limited to text vignettes presented in a fixed order. Although vignette methods enhance internal validity (as noted above), they lack the details and other contextual cues present during actual face-to-face peer-to-peer interactions (although they do represent many online peer exchanges). Future studies may consider utilizing virtual human technology or standardized photographs/videos that confer higher ecological validity while maintaining experimental control.^{22-24, 34}

Conclusions

This is one of the first studies to investigate the impact of patient and contextual factors on peer judgements about pain and disability. Our results indicate that peer recommendations systematically vary according to patient weight, fault of accident, and physical work demands. Because individuals with pain often seek information and advice from peers, these patient and contextual factors may be indirectly shaping patients' pain and disability decisions. These results support the need to further investigate how patient and contextual factors influence peer judgements, as well as how such judgements and recommendations impact decision making and health-seeking behaviors among patients with chronic pain.

Acknowledgements

We thank Indiana Poly Clinic for assistance with participant recruitment.

References

1. Bauer SM, McGuire AB, Kukla M, McGuire S, Bair MJ, Matthias MS. Veterans' pain management goals: Changes during the course of a peer-led pain self-management program. *Patient Educ Couns.* 99:2080-2086, 2016
2. Benigeri M, Pluye P. Shortcomings of health information on the Internet. *Health Promot Int.* 18:381-386, 2003
3. Budd GM, Mariotti M, Graff D, Falkenstein K. Health care professionals' attitudes about obesity: An integrative review. *Appl Nurs Res.* 24:127-137, 2011
4. Burgess DJ, Van Ryn M, Crowley-Matoka M, Malat J. Understanding the provider contribution to race/ethnicity disparities in pain treatment: insights from dual process models of stereotyping. *Pain Med.* 7:119-134, 2006
5. Carey TS, Hadler NM, Gillings D, Stinnett S, Wallsten T. Medical disability assessment of the back pain patient for the Social Security Administration: The weighting of presenting clinical features. *J Clin Epidemiol.* 41:691-697, 1988
6. Centers for Disease Control and Prevention: About Adult BMI. Available at: https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html Accessed May 24, 2018
7. Chibnall JT, Tait RC. Observer perceptions of low back pain: Effects of pain report and other contextual factors. *J Appl Soc Psychol.* 25:418-439, 1995
8. Costa-Black KM, Durand M-J, Imbeau D, Baril R, Loisel P. Interdisciplinary team discussion on work environment issues related to low back disability: A multiple case study. *Work.* 28:249-265, 2007

9. Crook J, Milner R, Schultz IZ, Stringer B. Determinants of occupational disability following a low back injury: A critical review of the literature. *J Occup Rehabil.* 12:277-295, 2002
10. Culver JD, Gerr F, Frumkin H. Medical information on the Internet. *J Gen Intern Med.* 12:466-470, 1997
11. Davison KP, Pennebaker JW, Dickerson SS. Who talks? The social psychology of illness support groups. *Am Psychol.* 55:205, 2000
12. Dennis C-L. Peer support within a health care context: A concept analysis. *Int J Nurs Stud.* 40:321-332, 2003
13. Diaz JA, Griffith RA, Ng JJ, Reinert SE, Friedmann PD, Moulton AW. Patients' use of the Internet for medical information. *J Gen Intern Med.* 17:180-185, 2002
14. Dickerson S, Reinhart AM, Feeley TH, Bidani R, Rich E, Garg VK, Hershey CO. Patient Internet use for health information at three urban primary care clinics. *J Am Med Inform Assoc.* 11:499-504, 2004
15. Evans SC, Roberts MC, Keeley JW, Blossom JB, Amaro CM, Garcia AM, Stough CO, Canter KS, Robles R, Reed GM. Vignette methodologies for studying clinicians' decision-making: validity, utility, and application in ICD-11 field studies. *Int J Clin Health Psychol.* 15:160-170, 2015
16. Evers AW, Kraaimaat FW, Geenen R, Jacobs JW, Bijlsma JW. Pain coping and social support as predictors of long-term functional disability and pain in early rheumatoid arthritis. *Behav Res Ther.* 41:1295-1310, 2003
17. Feuerstein M. A multidisciplinary approach to the prevention, evaluation, and management of work disability. *J Occup Rehabil.* 1:5-12, 1991
18. Finlay KA, Elander J. Reflecting the transition from pain management services to chronic pain support group attendance: An interpretative phenomenological analysis. *Br J Health Psychol.* 21:660-676, 2016
19. Fogel J, Albert SM, Schnabel F, Ditkoff BA, Neugut AI. Use of the Internet by women with breast cancer. *J Med Internet Res.* 4:e9, 2002
20. Fraenkel L, McGraw S. Participation in medical decision making: The patients' perspective. *Med Decis Making.* 27:533-538, 2007

21. Gaskin DJ, Richard P. The economic costs of pain in the United States. *J Pain*. 13:715-724, 2011
22. Hirsh AT, Alqudah AF, Stutts LA, Robinson ME. Virtual human technology: capturing sex, race, and age influences in individual pain decision policies. *Pain*. 140:231-238, 2008
23. Hirsh AT, George SZ, Robinson ME. Pain assessment and treatment disparities: a virtual human technology investigation. *Pain*. 143:106-113, 2009
24. Hirsh AT, Jensen MP, Robinson ME. Evaluation of nurses' self-insight into their pain assessment and treatment decisions. *J Pain*. 11:454-461, 2010
25. Hitt HC, McMillen RC, Thornton-Neaves T, Koch K, Cosby AG. Comorbidity of obesity and pain in a general population: Results from the Southern Pain Prevalence Study. *J Pain*. 8:430-436, 2007
26. Hollingshead NA, Matthias MS, Bair MJ, Hirsh AT. Impact of race and sex on pain management by medical trainees: a mixed methods pilot study of decision making and awareness of influence. *Pain Med*. 16:280-290, 2015
27. Hoogendoorn WE, van Poppel MN, Bongers PM, Koes BW, Bouter LM. Systematic review of psychosocial factors at work and private life as risk factors for back pain. *Spine*. 25:2114-2125, 2000
28. Janke EA, Collins A, Kozak AT. Overview of the relationship between pain and obesity: What do we know? Where do we go next? *J Rehabil Res Dev*. 44:245, 2007
29. Keefe FJ, Lipkus I, Lefebvre JC, Hurwitz H, Clipp E, Smith J, Porter L. The social context of gastrointestinal cancer pain: a preliminary study examining the relation of patient pain catastrophizing to patient perceptions of social support and caregiver stress and negative responses. *Pain*. 103:151-156, 2003
30. Marcus DA. Obesity and the impact of chronic pain. *Clin J Pain*. 20:186-191, 2004
31. Marteau TM, Riordan DC. Staff attitudes towards patients: the influence of causal attributions for illness. *Br J Clin Psychol*. 31:107-110, 1992
32. Matthias MS, McGuire AB, Kukla M, Daggy J, Myers LJ, Bair MJ. A brief peer support intervention for veterans with chronic musculoskeletal pain: A pilot study of feasibility and effectiveness. *Pain Med*. 16:81-87, 2015

33. McCarberg BH, Nicholson BD, Todd KH, Palmer T, Penles L. The impact of pain on quality of life and the unmet needs of pain management: results from pain sufferers and physicians participating in an internet survey. *Am J Ther.* 15:312-320, 2008
34. Miller MM, Allison A, Trost Z, De Ruddere L, Wheelis T, Goubert L, Hirsh AT. Differential effect of patient weight on pain-related judgements about male and female chronic low back pain patients. *J Pain.* 19:57-66, 2018
35. Peltonen M, Lindroos AK, Torgerson JS. Musculoskeletal pain in the obese: A comparison with a general population and long-term changes after conventional and surgical obesity treatment. *Pain.* 104:549-557, 2003
36. Ratzon NZ, Amit Y, Friedman S, Zamir S, Rand D. Functional capacity evaluation: Does it change the determination of the degree of work disability? *Disabil Health J.* 8:80-85, 2015
37. Ricci JA, Stewart WF, Chee E, Leotta C, Foley K, Hochberg MC. Back pain exacerbations and lost productive time costs in United States workers. *Spine.* 31:3052-3060, 2006
38. Romano JM, Turner JA, Jensen MP, Friedman LS, Bulcroft RA, Hops H, Wright SF. Chronic pain patient-spouse behavioral interactions predict patient disability. *Pain.* 63:353-360, 1995
39. Smedley R, Coulson N, Gavin J, Rodham K, Watts L. Online social support for complex regional pain syndrome: A content analysis of support exchanges within a newly launched discussion forum. *Comput Human Behav.* 51:53-63, 2015
40. Stewart WF, Ricci JA, Chee E, Morganstein D, Lipton R. Lost productive time and cost due to common pain conditions in the US workforce. *JAMA.* 290:2443-2454, 2003
41. Subramaniam V, Stewart MW, Smith JF. The development and impact of a chronic pain support group: A qualitative and quantitative study. *J Pain Symptom Manage.* 17:376-383, 1999
42. Tait RC, Chibnall JT. Observer perceptions of chronic low back pain. *J Appl Soc Psychol.* 24:415-431, 1994
43. Von Korff M, Moore JE, Lorig K, Cherkin DC, Saunders K, González VM, Laurent D, Rutter C, Comite F. A Randomized trial of a lay person-led self-management group intervention for back pain patients in primary care. *Spine.* 23:2608-2615, 1998

44. Wigton RS, McGaghie WC. The effect of obesity on medical students' approach to patients with abdominal pain. *J Gen Intern Med.* 16:262-265, 2001

Table 1. Bivariate correlations between participant factors and disability judgements

	Participant Age	Symptom Severity	Disability	Disability Compensation
Participant BMI	-0.15	-0.153	0.094	-0.079
Participant Age	-	0.145	0.174	0.131
Symptom Severity	-	-	.887*	0.670**
Disability	-	-	-	0.769**

** p<.01

Table 2. Results of ANOVAs examining effects of patient factors on participants' disability judgements

Judgement	Patient Variable	EMM (SE)	F	η^2	p	
Symptom Severity	Weight	<i>Obese</i>	66.60(1.91)	4.81*	0.06	
		<i>Normal</i>	64.97(2.07)			
	Fault	<i>At-fault</i>	64.33(2.10)	10.10**	0.13	
		<i>Not at-fault</i>	67.24(1.92)			
	Job Type	<i>Physical</i>	67.18(1.92)	15.00**	0.18	
		<i>Sedentary</i>	64.39(2.06)			
	Weight X Fault			1.61	0.02	
	Weight X Job Type			3.70	0.05	
	Fault X Job Type			2.57	0.04	
	Disability	Weight	<i>Obese</i>	63.07(2.17)	5.17*	0.07
			<i>Normal</i>	61.38(2.37)		
Fault		<i>At-fault</i>	59.87(2.37)	25.23**	0.27	
		<i>Not at-fault</i>	64.58(2.22)			
Job Type		<i>Physical</i>	64.74(2.27)	20.41**	0.23	
		<i>Sedentary</i>	59.71(2.35)			
Weight X Fault				3.20	0.04	
Weight X Job Type				0.53	0.01	
Fault X Job Type				0.39	0.01	
Disability Recommendation		Weight	<i>Obese</i>	59.07(2.71)	7.29*	0.09
			<i>Normal</i>	55.97(2.81)		
	Fault	<i>At-fault</i>	53.39(2.96)	18.08**	0.21	

	<i>Not at-</i>	61.66(2		
	<i>fault</i>	.79)		
Job Type	<i>Physical</i>	60.82(2	17.4	0
	<i>Sedentar</i>	.77)	3**	.20
	<i>y</i>	54.22(2		
		.87)		
Weight X Fault			0.46	.01
Weight X Job				0
Type			0.16	.02
Fault X Job				0
Type			0.60	.01

*p<.05

**p<.01

Abbreviations: EMM, estimated marginal means; SE, standard error

Table 3. Results of t-tests examining effects of participant factors on disability judgements

Judgements		Mean	SD	t	d
Symptom Severity	Sex				
	<i>Male</i>	6	1	-	0
		3	2.92	6.97	1.01
	<i>Female</i>	6	1		
		8	7.14	6.31	
Disability	Sex				
	<i>Male</i>	6	1	-	0
		3	0.76	8.89	0.44
	<i>Female</i>	6	1		
		8	2.89	9.08	
Disability Compensation	Sex				
	<i>Male</i>	5	2	0.4	0
		3	9.23	0.99	5
	<i>Female</i>	5	2		
		8	6.62	3.79	
Symptom Severity	Applied for Disability Compensation				
	<i>No</i>	6	1	-	0
		9	4.41	2.49	0.64
	<i>Yes</i>	6	2		
		6	7.45	1.86	
Disability	Applied for Disability Compensation				
	<i>No</i>	5	1	-	0
		9	7.64	6.09	2.15*
	<i>Yes</i>	6	2		
		6	7.81	2.12	
Disability Compensation	Applied for Disability Compensation				
	<i>No</i>	5	1	-	0
		9	4.12	9.58	1.65
	<i>Yes</i>	6	2		
		6	3.62	6.79	

*p<.05