# Intergroup anxiety in pain care: impact on treatment recommendations made by White providers for Black patients

**Alexis D. Grant, MA**[1], **Megan M. Miller, PhD**[1], **Nicole A. Hollingshead, PhD**[2], **Tracy M. Anastas, MS**[1], **Adam T. Hirsh, PhD**[1]

[1]Department of Psychology, Indiana University-Purdue University Indianapolis

[2]Department of Family Medicine, The Ohio State University

## Introduction

Race disparities in pain care have been well-documented, with Black patients at particularly high risk for receiving suboptimal pain care [21]. Factors contributing to these disparities include racial group differences in pain reporting, access to quality healthcare, and provider bias [29]. Because a majority of healthcare providers in the United States are White, a majority of pain patients, regardless of race, are likely to be treated by White providers [7]. Patient-provider racial discordance has received recent attention as a possible means to understanding racial disparities in healthcare [20; 26]. Specific to pain, Anderson and colleagues (2019) examined the effects of patient-provider racial discordance on pain reports in simulated clinical interactions. Mock providers administered painful heat stimuli to participants ("patients"), and participants reported the pain intensity of these stimuli orally to their mock provider. Results indicated participants in racially concordant dyads rated their pain higher than participants in racially discordant dyads. These data suggest a complex association between patient-provider racial concordance and pain outcomes [3].

One way patient-provider racial concordance may impact pain care is through intergroup anxiety. Intergroup anxiety is the discomfort experienced during interactions in which there is a lack of common group membership or shared identity among the participants [6]. Intergroup anxiety is conceptualized as a stable construct associated with a preference for interactions with same-group members (e.g., race-concordant) [28]. This trait-level intergroup anxiety affects state-level feelings of discomfort during interactions with people who are from a different group. For example, a White healthcare provider with higher trait-level intergroup anxiety would likely experience greater state-level (i.e., in the moment) discomfort while treating a Black patient with pain than would a White provider with a lower level of intergroup anxiety.

The effect of trait-level intergroup anxiety on state-level discomfort is likely to be particularly salient in high-risk, high-stress interactions [5; 28]. Healthcare providers

Corresponding Author: Adam T. Hirsh, 402 N. Blackford St., LD124, Indianapolis, IN 46202, Tel: 317-274-6942, athirsh@iupui.edu.

frequently report that chronic pain treatment decisions, particularly those involving opioids, are highly challenging, stressful, and burdensome [4; 11; 19]. Moreover, pain care has become increasingly high-stakes given the opioid crisis [14]. Research suggests these high-risk, high-stress interactions are most likely to give rise to discriminatory behaviors [8]. One survey of over 1,700 physicians found a positive association between physicians' self-reported anxiety and their self-reported use of patient race in treatment decisions [9]. Although that study was characterized by several limitations – it did not focus on pain care, nor did it examine providers' actual treatment behaviors – together with the previously cited literature, it provides preliminary empirical support to the idea that (White) provider anxiety may contribute to poorer pain care delivered to (Black) patients.

Despite the aforementioned theoretical and empirical foundation, to our knowledge, no studies have examined how trait-level intergroup anxiety and state-level discomfort contribute to racial disparities in pain care. The purpose of the current study was to advance understanding of how White providers' trait-level intergroup anxiety and state-level discomfort impact their pain treatment recommendations for Black patients. We hypothesized that White providers with higher trait-level intergroup anxiety would report more state-level discomfort while interacting with Black patients, which would impact their pain treatment decisions.

## Methods

### Overall Design

The current study is a planned secondary analysis of baseline data from a 2-arm RCT. Full study procedures can be found in the primary outcome paper [15]. The RCT included two sessions, spaced one week apart. The current study utilized data collected only at the first (pre-intervention baseline) session. At this session, participants ("providers") completed a demographics questionnaire and a measure assessing trait-level intergroup anxiety. Then, participants watched videos and read vignettes for 12 virtual human (VH) patients presenting with chronic low back pain. Patient vignettes were varied by race (Black, White) and socioeconomic status (low, high). Participants made pain assessment and treatment decisions for each patient. The current study focused exclusively on the interactions between White providers and Black patients, given that this is the most common intergroup dyad in clinical practice for Black patients, as well as the fact that Black patients are at particularly high risk for suboptimal pain care.

### Participants and Methods

Physician residents and fellows were recruited via email from university-affiliated training programs across the United States. To meet eligibility requirements for this study, providers had to be 18 years of age or older, currently enrolled in either a physician residency or fellowship program and be able to read and write in English. Inclusion criteria also required that providers have access to a personal computer with high-speed internet. Individuals were excluded if they had previously participated in a study using virtual human technology to investigate pain decision-making. Individuals who were interested in participating were instructed to contact the research team via email or phone. During this correspondence,

potential participants were provided additional information about the study procedures and screened for eligibility. Those who were interested and eligible were provided unique login credentials to access the study website. After logging into the study website, providers completed informed consent procedures, followed by a demographics questionnaire assessing personal and professional characteristics. Providers then completed the VH decision-making assessment task.

### Measures

**Demographics questionnaire—**Providers reported their sex, age, race/ethnicity, state of residence, current income, and parental income. They also provided information about their medical training program, including specialty, clinical experience, and experience with pain.

**Intergroup Anxiety Scale—**The Intergroup Anxiety Scale is a 12-item measure of trait-level intergroup anxiety, adapted from the original scale developed by Stephan & Stephan (1985). Respondents were asked to indicate – from 1 (not at all) to 10 (extremely) – how awkward, self-conscious, accepted, confident, defensive, careful, apprehensive, uncertain, anxious, comfortable, impatient, and trusting they feel when providing care to patients who are culturally different from themselves. Responses were averaged to create a total score. This measure has been used in numerous previous studies [23; 31] and has been shown to have good internal and construct validity [28]. It also demonstrated good internal consistency in the current sample (Cronbach's alpha = 0.89).

### Pain Treatment Decision Task

**Virtual patient stimuli—**Providers were presented full-motion videos and text vignettes of patients with chronic pain. The videos consisted of animated virtual patients from our catalogue of standardized and validated patients that have been used in prior studies. Patient race (Black/White) and SES (low/high) were systematically matched across patients. For the current paper, we only examined provider decisions for Black patients. All patients dynamically expressed a high level of pain through facial and body movements in the videos.

Text vignettes accompanying each video described patients as having chronic low back pain for over one year that was recently aggravated. Specific features of the pain were described, and the pain was noted to be moderate (chronic) and severe (recent) in intensity. Vital signs varied minimally across patients and were always within normal limits. The specific text (e.g., patient name, details of the recent aggravation) also varied to increase study realism and provider engagement; however, these details were equivalent and matched across patients.

Twelve unique patients were created for the baseline (time 1) assessment in the parent RCT. Data for the six Black patients were analyzed for the current study.

**Provider decisions—**Providers rated their state-level comfort level for each patient by responding to the question "Rate your level of comfort in providing care for this patient."

Responses were recorded on a VAS with anchors at 0 (not at all comfortable) and 100 (extremely comfortable).

For each patient, providers also rated their likelihood of using an oral opioid analgesic, referral to a pain specialist, physical therapy, and oral non-opioid analgesic. These treatment decisions were indicated on separate VASs with anchors at 0 (not at all likely) and 100 (very likely).

### Analyses

Descriptive statistics were used to characterize the sample, as well as provider decisions (Table 1). Mediation models with 5,000 bootstrap resamples [13] tested the extent to which providers' state-level comfort mediated the effect of providers' trait-level intergroup anxiety on their pain treatment decisions for Black patients (Figure 1). Separate models were conducted for opioid analgesics, non-opioid analgesics, pain specialist referrals, and physical therapy.

## Results

### Sample Characteristics

Five hundred and two providers were recruited for Session 1 (baseline) of the study. Excluding those who did not complete the decision-making task or did not meet eligibility requirements yielded a final sample of 436 providers who completed Session 1. Of the 436 providers, 297 (68.1%) self-identified as White, 9 (2.1%) as Black or African American, 110 (25.2%) as Asian, and 19 (4.4%) as other; 1 provider did not report race. Twenty providers (4.6%) self-identified as Hispanic ethnicity. The White providers (n=297) included in the current analyses had a mean age of 29.9 years (SD=3.2), and a slight majority identified as male (58.9%). The most represented clinical specialties included anesthesiology (18.7%), primary/internal/family medicine (18%), and pediatrics (14.2%). Providers reported a moderate amount of clinical experience with pain, with a mean of 41.39 (SD=23.46) on a 0 ("not at all experienced") to 100 ("very experienced") visual analogue scale.

### Opioid Treatment

The results of the mediation model predicting opioid treatment are presented in Figure 2. Path *a* was significant in that White providers' higher trait-level intergroup anxiety was significantly associated with lower state-level comfort in treating Black patients. Providers' state-level comfort significantly predicted their opioid treatment recommendations (path $b=$ −0.20, p<.001). Moreover, state-level comfort significantly mediated the relationship between trait-level intergroup anxiety and opioid treatment recommendations (indirect effect=0.76, 95% confidence interval [CI]: 0.21, 1.51). Specifically, White providers' higher trait-level intergroup anxiety predicted lower state-level comfort, leading to higher opioid treatment recommendations for Black patients.

### Non-Opioid Analgesic Treatment

The results of the mediation model predicting non-opioid analgesic treatment are presented in Figure 3. As before, path *a* was significant (trait level intergroup anxiety → state-level

comfort). State-level comfort significantly predicted non-opioid analgesic treatment recommendations (path $b$=0.12, p<.001) and significantly mediated the relationship between trait-level intergroup anxiety and non-opioid analgesic treatment recommendations (indirect effect=−0.45, 95% CI: −0.94, −0.12). White providers' higher trait-level intergroup anxiety predicted lower state-level comfort, leading to lower non-opioid analgesic treatment recommendations for Black patients.

### Pain Specialist Referral

The results of the mediation model predicting pain specialist referrals are presented in Figure 4. Path $a$ was significant (trait level intergroup anxiety → state-level comfort). State-level comfort significantly predicted pain specialist referrals (path $b$=−0.24, p<.001) and significantly mediated the relationship between trait-level intergroup anxiety and pain specialist referrals (indirect effect=0.91, 95% CI: 0.26, 1.78). Specifically, White providers' higher trait-level intergroup anxiety predicted lower state-level comfort, leading to higher pain specialist referrals for Black patients.

### Physical Therapist Referral

The results of the mediation model predicting physical therapist referrals are presented in Figure 5. Path $a$ was significant (trait level intergroup anxiety → state-level comfort). State-level comfort did not significantly predict physical therapy referrals (path $b$=0.03, p=.68), nor did it significantly mediate the relationship between trait-level intergroup anxiety and physical therapy referrals (indirect effect=−0.10, 95% CI: −0.74, 0.44).

## Discussion

Race disparities in pain care are well-documented in the literature [21; 24]. One hypothesized contributor to these disparities is patient-provider racial discordance. To better understand this interpersonal dynamic, we conducted mediation analyses testing the hypothesis that White providers' higher trait-level intergroup anxiety would lead to lower state-level feelings of comfort[1] treating Black patients, thereby impacting providers' pain treatment recommendations (Figure 1). Results indicated that this mediation pathway was significant for treatments involving opioids, non-opioid analgesics, and pain specialist referrals, but not for physical therapy referrals.

White providers with higher trait-level intergroup anxiety reported more state-level discomfort treating Black patients, resulting in a greater likelihood of recommending opioids and pain specialists for Black patients. The mediation pathway for non-opioid analgesics was also significant but the impact on treatment was in the opposite direction: higher provider anxiety → more state-level discomfort → lower non-opioid analgesics. These mediation pathways can be interpreted through the lens of intergroup anxiety theory. According to this theory, state-level interpersonal discomfort arises from an interaction

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[1]Because path $a$ of the mediation models showed a negative association between the measured variables of trait-level intergroup anxiety and state-level comfort, we felt it was clearer and easier to understand if this association was characterized in terms of "more state-level discomfort" instead of "less state-level comfort." Thus, the phrase "more state-level discomfort" is used in the subsequent paragraphs.

between a person's traits (e.g., individual differences in intergroup anxiety) and relevant situational factors [6]. In the context of cross-racial interactions, situational factors that amplify the effects of trait-level intergroup anxiety include lack of information about the respective groups, low sense of agency regarding the interaction, and lack of familiar "scripts" for interpersonal behavior [1; 6; 12; 18]. These situational factors contribute to negative outcome expectancies (e.g., "This interaction will be difficult"), which are recursively linked to higher anxiety and state-level discomfort. These expectancies are particularly relevant for pain given that providers already hold negative outcome expectancies for interactions around chronic pain treatment, describing them as "frustrating," "overwhelming," and "ungratifying" [14; 19]. In pain treatment interactions between White providers and Black patients, providers may additionally feel they lack well-defined scripts for interpersonal behavior. This concern, coupled with stress surrounding the changing attitudes and protocols for opioid prescribing and chronic pain care, may exacerbate their state-level discomfort treating Black patients with pain [14]. The anxiety-inducing effects of these situational factors may be further amplified for providers with higher trait-level intergroup anxiety, thereby increasing the likelihood that these providers' treatment recommendations will be informed by a "protective self-preservational style" characterized by avoidance of conflict and feelings of discomfort [25].

White providers with higher trait-level intergroup anxiety felt more state-level discomfort treating Black patients, which was associated with a greater likelihood of prescribing opioids and making pain specialist referrals (Figures 2 and 4, path b). Patients may explicitly and/or tacitly prioritize opioids for chronic pain, and providers run the risk of fomenting conflict by prioritizing non-opioid alternatives [14]. Similarly, patients are likely to perceive pain specialist referrals as legitimizing, because they convey trust in patients' self-reported pain severity. By recommending the most "legitimizing" treatments – from the patient's perspective – providers may be attempting to manage their discomfort and negative outcome expectancies and reduce the potential for conflict. In addition to being emotionally draining, such conflict has reputational and financial implications given the ascendance of patient satisfaction reviews [19].

Interestingly, the mediation pathway for non-opioid analgesic recommendations was in the opposite direction as opioid and pain specialist referrals, such that higher intergroup anxiety predicted more state-level discomfort, thereby predicting fewer non-opioid recommendations. Applying the same interpretive framework as above, providers may anticipate difficulty recommending and explaining their rationale for non-opioid analgesics given that non-opioid analgesics may feel less "legitimizing" to patients with chronic pain due to their association with minor aches and pains rather than severe and persistent pain. Thus, patient-provider interactions surrounding non-opioid analgesics may be more emotionally charged or at least more time-consuming. This concern may be particularly salient for White providers with higher intergroup anxiety treating Black patients, leading these providers to recommend treatments that require the least persuasion, education, and possibility for conflict (i.e., opioids and specialists rather than non-opioids). Consistent with Schlenker & Leary's (1982) notion of a "protective self-preservational style," our findings suggest that providers with higher intergroup anxiety are particularly motivated to avoid

conflict and may attempt to do so by making the most legitimizing treatment recommendations.

Neither trait-level intergroup anxiety nor state-level discomfort influenced providers' referrals to physical therapists. The decision to make a physical therapy referral may be more strongly associated with provider perceptions of other factors, such as patient willingness and/or ability to participate in physical therapy, which is time-consuming and requires considerable investment of financial and personal resources [17]. Alternatively, physical therapy referrals may carry a less polarizing message than other treatment modalities [16]. As such, patients may be more open to – or at least have less predictably negative reactions to – physical therapy. Consequently, providers' decisions about this treatment modality may not be shaped by a protective self-preservational style.

This study provides important new information about intra- and inter- personal contributors to race disparities in pain care. Although speculative, these findings suggest that intergroup anxiety and the resulting situational discomfort encroach on clinical decision-making by influencing White providers' motivations and decisions about which pain treatments to recommend to Black patients. Integrating these findings with prior research – which has typically found that Black patients receive fewer and weaker opioids than White patients – is not a simple matter. The clinical zeitgeist has changed, largely in response to the opioid crisis. In contrast to years past, opioids are now more scrutinized and are no longer considered the first-line treatment for chronic pain [10]. Medical training programs have also enhanced their curricula on chronic pain and opioid use [27]. Similarly, there is now greater awareness of and education about racial disparities in health, although there is still considerable room for improvement [22]. These changes to the sociocultural landscape of chronic pain care make it difficult to contextualize and interpret new findings. However, they do point to the need for ongoing research in this area. Should the current findings be replicated in future studies, they would support interventions to help providers become more aware of their trait-level intergroup anxiety and manage their state-level reactions to patients who are racially/ethnically different from themselves. One evidence-based intervention to reduce intergroup anxiety and improve intergroup relations involves positive intergroup contact. For this contact to be successful, the groups must be equal status, work toward common goals, experience intergroup cooperation, and have the support of authorities, laws, and/or customs [2; 30; 32]. Contact interventions might serve as a foundation from which to design interventions to reduce intergroup anxiety among White providers and improve pain care for racial minority patients.

The current study has several notable strengths. Our use of virtual patients provided high levels of control and realism, allowing for rigorous hypothesis testing. The sample was large and geographically diverse, including providers from across the US. Participants were physician residents and fellows, an important group to study given that they are currently involved in patient care and are at the early stages of their clinical careers. Thus, not only will these providers deliver care to hundreds of thousands of patients in the coming years, but these results also provide a snapshot of the ongoing challenges of patient care in an increasingly multicultural society. Despite advances in medical curricula surrounding culturally-sensitive care, as well as increased public attention regarding health disparities,

the current results suggest that there is still ample room for improvement. Residency and fellowship programs may be the optimal place to incorporate brief interventions to enhance providers' interpersonal comfort and skill in treating diverse patients.

Several study limitations should also be considered. Despite their advantages, virtual patient stimuli do not capture the full complexity of patient-provider interactions in the real world. Notably, providers may experience less situational anxiety making treatment decisions for virtual patients in the context of an experimental protocol. Relatedly, our single-item measure did not capture other indicators of situational anxiety (e.g., proximity, eye-contact) that might be relevant to pain care. Nevertheless, the single-item measure has high face validity and scores showed considerable variability (range: 5.1–100), suggesting that providers responded in clinically relevant ways to the virtual patients. It should also be reiterated that we examined White providers' interactions with Black patients. This is consistent with the theoretical model of intergroup anxiety for cross-racial (i.e., "intergroup") interactions, as well as the nature of racial disparities in pain care in the US. Nevertheless, these results may not generalize to interactions involving providers and/or patients of different racial and ethnic backgrounds. Finally, the attitudes and clinical decision-making of early career physicians may differ from more seasoned physicians, thus, potentially limiting the generalizability of these results.

In summary, results from this analogue, virtual patient study indicated that White providers with higher trait-level intergroup anxiety reported more state-level discomfort treating Black patients and were thereby more likely to recommend opioid and pain specialty treatments and less likely to recommend non-opioid analgesics. Future studies should aim to replicate these findings in a more naturalistic healthcare environment, where additional factors affecting the patient-provider interaction may influence provider decision-making. Additionally, given that minority providers likely have different levels of dispositional intergroup anxiety and situational discomfort, which might also differ across specific racial and ethnic categories, future studies are needed to understand whether and how these results apply to provider-patient dyads that differ from those examined herein. This line of research may inform interventions to help providers gain awareness of and manage their interpersonal anxiety. Given that most minority patients are seen by White providers, such interventions may be particularly effective in advancing global efforts to reduce pain-related disparities.

## Acknowledgements

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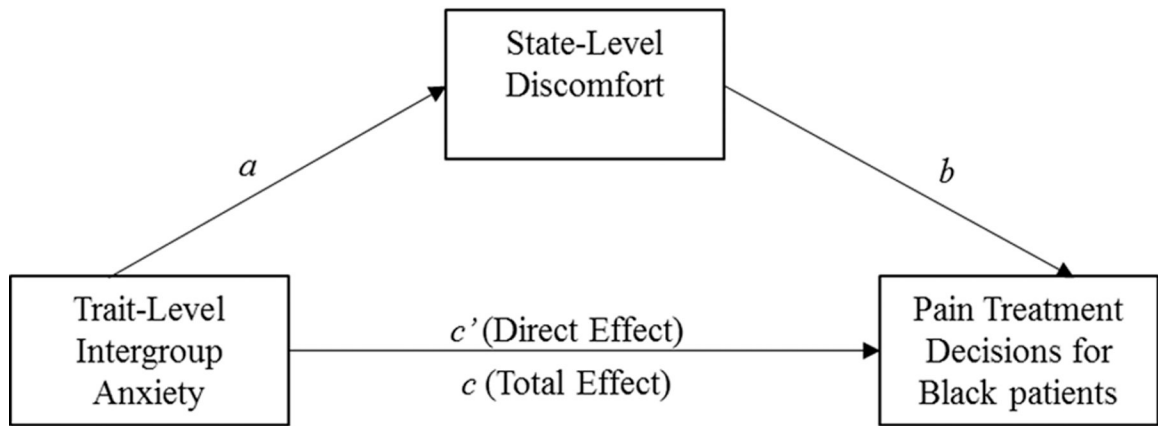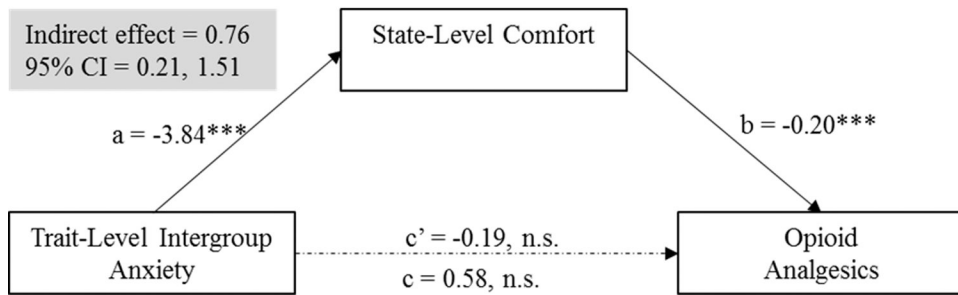**Figure 1.**
Conceptual model.

**Figure 2.**
Mediation model predicting opioid analgesic treatment. Note: *$p$ < .05, **$p$ < .01. Paths with significant regression coefficients are marked with a solid line; paths with non-significant regression coefficients are marked with a dotted line.
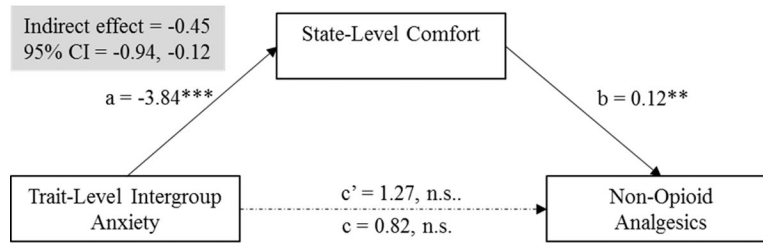
**Figure 3.**
Mediation model predicting non-opioid analgesic treatment. Note: *$p < .05$, **$p < .01$. Paths with significant regression coefficients are marked with a solid line; paths with non-significant regression coefficients are marked with a dotted line.
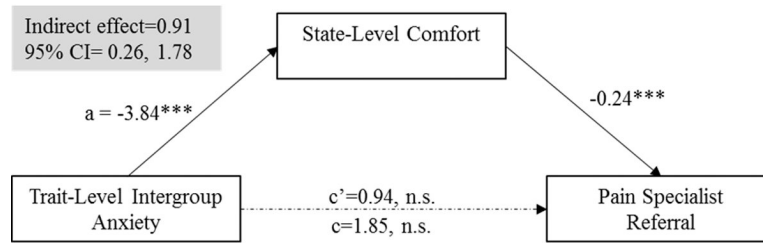
**Figure 4.**
Mediation model predicting pain specialist referrals. Note: *$p$ < .05, **$p$ < .01. Paths with significant regression coefficients are marked with a solid line; paths with non-significant regression coefficients are marked with a dotted line.

**Figure 5.**
Mediation model predicting physical therapy referrals. Note: *p* < .05, **p* < .01. Paths with significant regression coefficients are marked with a solid line; paths with non-significant regression coefficients are marked with a dotted line.
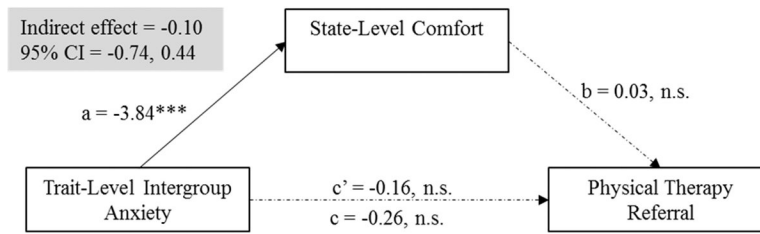
**Table 1.**

Descriptive data and zero-order correlations for study variables.

| Variable | Mean | SD | Range | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| 1. Intergroup Anxiety Scale (trait-level) | 3.91 | 1.28 | 1–8.25 | | | | | |
| 2. Comfort with Patients (state-level) | 68.70 | 23.12 | 5.1–100 | −.23** | | | | |
| 3. Opioid Analgesic | 23.79 | 22.13 | 0–99.8 | .06 | −.14** | | | |
| 4. Non-Opioid Analgesic | 89.07 | 16.61 | 19.67–100 | −.03 | .17** | −.20** | | |
| 5. Specialist Referral | 23.40 | 24.54 | 0–100 | .11* | −.24** | .26** | −.13** | |
| 6. Physical Therapist Referral | 79.15 | 25.08 | 1.17–100 | −.04 | .07 | −.10* | .24** | .23** |

Note: Intergroup Anxiety Scale (trait-level) ranged from 1–10. All other scales ranged from 0–100.

*
$p < .05$,

**
$p < .01$.