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Running Head: CLASSISM IN PAIN ASSESSMENT AND MANAGEMENT

Classism in pain assessment and management: The mediating role of female patient
dehumanization and perceived life hardship.

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Abstract

Compared to racism and sexism, classism in pain assessment and management practices (PAMP) has been less investigated and its mediating mechanisms are still unknown. Drawing upon a social psychological model of dehumanization, this research aimed to test: (1) the effect of patient socioeconomic status (SES; a proxy of social class) on PAMP and (2) whether patient dehumanization and perceived life hardship mediated these effects. Two online experimental studies were conducted, in which patient SES was manipulated (Low vs. High) within-subjects. One-hundred sixty-two female medical students (study 1) and 105 female nurses (study 2) were presented with vignettes/pictures depicting two cases of women with chronic low-back pain, followed by videos of them performing a pain-inducing movement. Participants reported on patient dehumanization, perceived life hardship and PAMP. The Low SES patient was perceived as less pain sensitive (medical students only) but more disabled, credible and her pain more attributed to psychological causes (by nurses only). Medical students recommended less non-pharmacological treatments but prescribed slightly stronger medication. Medical students were less willing to provide individualized care to the Low SES patient, whereas nurses showed the opposite pattern. Patient mechanistic dehumanization mediated SES effects on pain disability (medical students only). Perceived life hardship mediated SES effects on pain disability, credibility (nurses only) and intentions of providing individualized care (nurses only). These findings bear novel contributions to the fields of pain, health service research and social psychology, and have important implications to the development of more effective future interventions to reduce classism in PAMP.

Key words: chronic pain, classism, dehumanization, healthcare professionals, pain assessment

1. Introduction

Compared to racism and sexism [8,43,49,52], classism in pain care has only garnered recent attention. It implies the categorization of individuals according to their social class or (its proxy) socioeconomic status (SES; see Krieger's glossary for concept definitions) [35] and the use of a socially constructed, widely shared belief system to make inferences about them [21,38,39,54]. Classism in pain care may bear particularly devastating consequences for individuals of lower SES, who are more heavily affected by severely disabling chronic pain [10,13,43].

Despite scant and somewhat inconsistent, evidence shows that patient SES influences pain assessment and management practices (PAMP). Compared to higher SES patients, lower SES patients' pain was perceived by providers as less severe [11] and, in the presence of distress cues, more attributed to psychological causes and less credible [11]. Lower SES patients were described as more demanding [30], less competent to self-manage pain [19,30] but more disabled [19,30]. They were also prescribed less opioids and guideline treatments [16,30-32,48], less referred to pain specialists and multidisciplinary treatments [30] and more likely to get generic pain medication [30,32,48] and psychoeducation recommendations [19,30,32,48]. These findings generally suggest that lower SES patients' pain is more likely under-assessed/managed. However, little is known about the mechanisms accounting for such disparities, potentially hampering the development of effective interventions to suppress them [28]. This paper aims to bridge this gap by: (1) producing more experimental findings on providers' classism in PAMP, and (2) testing two of its potential underlying mechanisms—patient dehumanization and life hardship.

Dehumanization is an everyday, pervasive and often subtle person perception phenomenon in health-care contexts [18]. According to the Dual Model of Dehumanization [25,27], we may dehumanize others by perceiving them as more animal-like (animalistic dehumanization) or more object/machine-like (mechanistic dehumanization). The link between dehumanization and social class/SES is well established. Animalistic dehumanization is a strong component of low SES stereotypes across time and cultures [21,40] and high SES people are sometimes perceived as machine-like [25,27]. The link between dehumanization and pain care is less well-supported but a few recent findings suggest its potential clinical relevance; e.g., patient mechanistic dehumanization led physicians to recommend more invasive treatments [36] and animalistic dehumanization was associated to nurses' descriptions of low-SES chronic pain patients as less competent to self-manage pain, increasing referrals to psychoeducation [19].

Social class is also strongly associated to perceived life hardship [38,39]. A few experimental studies have shown that when laypeople perceived others as having a harder, less privileged life they also perceived them as less sensitive to pain [29,53]. Whether such perceptions influence other dimensions of pain assessment/management remains unexplored.

These scarce findings suggest that it is reasonable to expect that Low SES patients' pain will be underassessed/managed compared to High SES patients' pain (Hypothesis 1) and these effects will be mediated by patient dehumanization (Hypothesis 2) and perceived life hardship (Hypothesis 3). To test these hypotheses, we have conducted two experimental studies - with medical students (study 1) and nurses (study 2). Medical and nursing professions differ in social status [37,42] and training (focus on curing vs. caring) [6,15], which could influence the

extent to which patient SES is integrated in medical students' and nurses' PAMP. These differences were explored.

2.Methods

2.1. Study 1

2.1.1. Participants

An *a priori* power analysis using *MedPower* [33] estimated a sample of 114 to detect an indirect effect (ab), in a between-subjects design, considering a power of .80, $p=0.05$, $a=.40$, $b=.25$ and $c'=.20$. Recent findings show that within-subject designs require about half the sample size of between-subject designs to detect indirect effects of the same size [46]. Given that our study design was within-subjects, we estimated that we would need a minimum sample size of 57 participants. Data was collected online among undergraduate students at several Portuguese medical schools, who were invited to participate through their university e-mail systems. Of the initial 470 online responses obtained, 248 (52.8%) were eliminated because the survey was not completed in full, 3 because participants were not Portuguese (to control for cultural background) and 1 because the participant was not a medical student. This drop-out rate is not uncommon in online studies - such as the ones presented herein - that are long and/or place a high cognitive load on respondents [20]. To control for confounds between participant/patient sex and patient SES, and because there is a worldwide higher prevalence of female patients with chronic pain [3,4,12,45], only female medical students were included in the sample (56 male students were excluded).

The final sample included 162 female medical students, most were single (95.7%) and were aged between 18 and 60 years old ($Q_1=21$; $Q_2=22$; $Q_3=24$; $M=23.05$; $SD = 4.83$).

Most participants studied in medical schools in Lisbon (42%), followed by Porto (14.2%), Algarve (7.4%) and Covilhã (4.9%). The remaining participants did not specify the name of the university. Participants were mostly attending the 4th or 5th grades; i.e. final years (43.3% combined) and almost half of the sample (46.3%) had not decided yet what specialty to choose. Most of the students never had pain for more than three consecutive months (68.5%). Of those who reported chronic pain (31.5%), 17.3% mentioned that it was still an ongoing pain, felt daily (13.6%) or three to four times per week (9.3%) and with an average pain intensity of 5.04 out of 10 (SD=2.00). Pain was mostly located in their lower back, head and/or knees.

2.1.2. Experimental design and Independent Variable

This experimental study was conducted with one within-subjects factor (pain patient SES: low vs. high). Each participant was asked to assess two clinical scenarios depicting white (*i.e.*, with a light skin tone) female patients with chronic low back pain, in which patients' SES was manipulated using a written vignette together with a picture. More specifically, patient SES was manipulated by changing two commonly used prestige-based indicators of socioeconomic position, *i.e.*, level of education and occupation [24,41]. Afterwards, a video of the same patient performing a pain-inducing activity (laying down on a bed and standing up) was shown. Pictures/videos were randomly paired with written vignettes and the order of presentation of the clinical cases was counterbalanced. Vignettes were adapted from previous studies [7,9,11] and are presented below; the alternative wording for both experimental conditions is highlighted in bold and the information in italics (patient's name, age and pain duration) was counterbalanced across experimental conditions:

*Maria Ferreira/Paula Santos, a 45/47-years-old woman, completed the **9th grade/a doctoral degree** and is a **factory worker/judge**. She complains of an aggravation of low-back pain, with which she claims to have been living for more than 4/6 months.*

The pictures/videos were selected from the Ghent Pain Videos of Daily Activities (G-PAVIDA) [17] and pretested with Portuguese laypeople and nurses as to explore how female patients were perceived in terms of their SES, age, educational level, profession, and pain intensity. Based on pre-test findings two pictures/videos of patients perceived as middle aged, with normal weight and moderate levels of pain behaviors were chosen. Pre-tests also showed that these women were perceived as ambiguous in terms of SES, *i.e.*, they could be perceived as either having a low or a moderate/high SES, hence, guaranteeing the ecological validity of our SES manipulation.

After reading/seeing each written vignette/picture (but before watching the video), a manipulation check for patient SES was included by asking participants to recall patients' profession and report their perceived social status on the MacArthur Scale of Subjective Social Status [1]. This scale presents a "social status ladder" with 10 rungs representing where people stand in society. Participants had to select the rung in which they felt the patients stood. The higher the rung, the higher the perceived social status. Participants who did not correctly recall patients' profession (*e.g.*, reporting the patient was a teacher instead of a judge) were excluded from the analyses as to ensure the manipulation of the independent variable. Moreover, in line with previous experimental studies on social disparities in pain assessment and management [7,9], and to control for patients' age and type of pain (acute

vs. chronic), participants were asked to recall patients' age and whether the patient was feeling pain for more vs. less than 3 months. This task served the purpose of ensuring that all participants' first impression of the patients corresponded to middle-aged adults with chronic pain. Participants who recalled patients as younger (<40 years) or older adults (>60 years) or feeling pain for less than 3 months (acute pain) were excluded from the analyses.

2.1.3. Mediators

Dehumanization. The Dual Model of Dehumanization [25,27] identifies two orthogonal senses/dimensions of humanness: (1) *Human Nature*, i.e., characteristics that distinguish humans from objects/machines, which are usually associated to emotional/experiential depth and vitality; and (2) *Human Uniqueness*, i.e., characteristics that distinguish humans from other animals, which are usually associated to rationality, civility, maturity and morality. Hence, we may dehumanize others in different ways and degrees, depending on the dimensions of humanness we deny them. The Dual Model [25,27] specifically focuses on two types of dehumanization – animalistic and mechanistic.

According to the model's operationalization strategies [5,26], animalistic dehumanization implies the attribution to others of characteristics that are simultaneously low in *Human Uniqueness* and high in *Human Nature*. In other words, we perceive people as more animal-like when we describe them with characteristics that, at the same time, are perceived as being able to describe other animals (low in *Human Uniqueness*) but less applied to the description of objects/machines (high in *Human Nature*). Conversely, mechanistic dehumanization implies the attribution to others of characteristics that are simultaneously high in *Human Uniqueness* and low in *Human Nature*. That is, we perceive people as more

machine-like when we describe them with characteristics that, at the same time, are perceived as not being able to describe other animals (high in *Human Uniqueness*) but can be applied to the description of objects/machines (low in *Human Nature*).

Drawing upon Haslam et al.'s trait-based measures of dehumanization [5,26], a set of eight traits, adapted and validated for the Portuguese population [14] were used to assess the extent to which participants perceived the patient as more animal-like or machine-like. To assess *animalistic dehumanization*, participants had to rate the extent to which four traits – *emotive, helpful, active, fun-loving* – applied to their first impression of the patient on a 7-point Likert scale ranging from 1 (“Does not apply”) to 7 (“Totally applies”). In the adaptation study for the Portuguese population [14], these traits were rated as high in *Human Nature* (i.e., traits that distinguish humans from objects/machines) but low in *Human Uniqueness* (i.e., traits that poorly distinguish humans from other animals). The animalistic dehumanization score resulted from the average of the four items. The higher the score, the higher patients’ animalistic dehumanization.

To assess mechanistic dehumanization, participants rated the extent to which four traits - *thorough, refined, conscientious, broadminded* – applied to their impression of the patient on the same Likert scale. In the Portuguese adaptation study [14], these traits were rated as high in *Human Uniqueness* (i.e., traits that distinguish humans from other animals) but low in *Human Nature* (i.e., traits that are less suited to differentiate humans from objects/machines). The mechanistic dehumanization score resulted from the average of the four items. The higher the score, the higher patients’ mechanistic dehumanization.

All traits were rated with positive valence [14]. In the present sample, both subscales presented good internal consistency indices in the Low SES condition ($\alpha=.82$) and the high SES condition (.73 and .84 for the animalistic and mechanistic dehumanization scales, respectively).

Perceived Life Hardship. An adapted version of the four-item scale proposed by Trawalter et al. [53]. was used to assess the extent to which medical students perceived patients' lives as being hard and full of adversities. More specifically, participants were asked to rate on a 7-point Likert scale ranging from 1 (*Not at all/None*) to 7 (*Extremely/Extreme*) the following items: (1) *How privileged do you consider this patient has been?* (2) *How hard do you think this patient's life has been?* (3) *To what extent do you think this patient has been lucky?* (4) *How much adversity do you think this patient has been through?* The average of the 4 items was calculated after reverse scoring items 1 and 3; the higher the score the higher the perceived life hardship. In this study, good internal consistency indices were obtained ($\alpha_{\text{LowSES}}=.73$; $\alpha_{\text{HighSES}}=.70$).

2.1.4. Dependent variables

Pain assessment. Four dimensions of pain judgements were assessed: (1) Pain Intensity, (2) Pain Disability, (3) Pain Credibility and (4) Psychological Attributions. Participants were asked to evaluate pain intensity while patients were performing the pain-inducing movement (*How do you rate this woman's pain intensity while she is performing this movement?*), measured on a 11-point numerical rating scale (NRS-10) varying between 0 (*no pain*) and 10 (*worst pain imaginable*). NRS-10 has been recommended as one of the most reliable measures of pain intensity [22]. The remaining dimensions were measured using

previously validated two-item scales [7,9,11], ranging from 1 (*not at all*) to 7 (*extremely*). The questions asked were as follows: *To what extent do you believe this pain interferes with this woman's family/professional life?* (Pain Disability); *To what extent do you believe this patient's pain is genuine/credible?* (Pain Credibility); *To what extent do you believe this patient's pain is caused by emotional/psychological factors?* (Psychological Attributions). Scores were obtained by calculating the average of the two items, with higher scores representing higher levels of pain disability, pain credibility and psychological attributions. All scales presented very good internal consistency indices in both SES conditions, *i.e.*, all Spearman-Brown coefficients (r_{sb}) were above .87.

Pain Management. Medical students were, first, asked to report their intentions of engaging in individualized care practices with each patient and then their likelihood of prescribing the latter (non) pharmacological treatments.

Regarding their intentions of offering individualized or person-centered care, an adaptation of the Portuguese version of the Individualized Care Scale [2,51] was used. More specifically, seven items were used to assess participants' willingness to recognize and acknowledge patients' individual perspectives regarding their own clinical situation (Clinical Situation subscale, *e.g.*, *To which extent would you be willing to: (...) talk with the patient about her feelings towards her health condition? (...) talk with the patient about her needs that require care and attention?*) and five items to assess their willingness to share decisional control over care with the patient (Decisional Control subscale, *e.g.*, *To which extent would you be willing to: (...) ask the patient what she wants to know about her current health status? (...) negotiate with the patient the responsibility over her care as far as she is able?*). All items were rated using a 5-point Likert-type scale ranging from 1 (*not at all willing*) to 5 (*totally*

willing). Scores for each dimension were obtained by calculating the average of the items, with higher scores representing stronger intentions of providing individualized care. Good internal consistency indices were obtained for the Clinical Situation subscale ($\alpha = .89$ for both SES conditions) and the Decisional Control subscale ($\alpha = .80/.81$ for low/high SES, respectively).

As for treatment recommendations, drawing upon previous studies on pain assessment and treatment [7], three items were used to measure the following dimensions: (a) Likelihood of recommending nonpharmacological treatments (*How likely would you recommend nonpharmacological therapies to this patient, such as, walking, massage or hydrotherapy?*), rated on a Likert scale ranging from 1 (*not at all likely*) to 7 (*extremely likely*); (b) Likelihood of recommending psychoeducational counselling (*How likely would you recommend psychoeducational counselling to this patient?*), rated on a Likert scale ranging from 1 (*not at all likely*) to 7 (*extremely likely*); (c) Pharmacological treatment prescriptions (*Which of the following options do you think would be the best treatment choice for this patients? 1-No pharmacological treatment; 2-Non-opioid analgesic; 3-Non-opioid analgesic + non-steroidal anti-inflammatory; 4- Non-opioid analgesic + non-steroidal anti-inflammatory + weak opioid analgesic; 5- Non-opioid analgesic + non-steroidal anti-inflammatory + strong opioid analgesic*). The development of this latter item was based on the World Health Organization's analgesic ladder [55].

2.1.5. Procedure

This study was approved by the Ethical Committee of ISCTE - Lisbon University Institute. Data were collected using the online software program Qualtrics®. Medical schools around the country were contacted and asked to send a recruitment e-mail to their

undergraduate students mailing lists inviting them to participate on a study about decision-making processes in clinical contexts. The study was approved by the Boards of Directors of the participating institutions. Recruitment also took place via social media, namely, through Facebook pages of medical students' associations, after their approval. On the landing page of the online survey, participants were invited to take part in a study supposedly on memory and decision-making processes in clinical contexts (cover story). The voluntary nature of the study, anonymity and confidentiality were ensured. Informed consent was required to proceed to the survey.

The experimental conditions (low SES vs. high SES) were presented to participants in a randomized order. For each condition, participants were asked to answer the same set of questions presented in the same order. First, participants saw the picture and read the associated vignette. Then, they were asked to answer the manipulation check and control questions, followed by the trait-based dehumanization and the perceived life hardship scales. Subsequently, participants saw the video and were asked to fill in the pain assessment and pain management measures. Finally, sociodemographic, and clinical data were collected, *i.e.*, age, nationality, civil status, parents' level of education, year of graduation, personal and vicarious experience of chronic pain. It should be noted that given the within-subjects nature of the design, several procedures were implemented to prevent participants' awareness of the study's goals. These procedures included the cover story and the counterbalancing of written information provided in the vignettes (patients' names, ages, pain duration) and visual information in the pictures and videos (e.g., patients' clothes, posture). The time required to complete the protocol was on average 25 minutes. One 25€ gift voucher was drawn at random among those who left their emails for being compensated for their

participation. Also, participants were thanked, debriefed and the ones who were interested in knowing more about the study submitted their email address.

2.1.6. Data analysis

All analyses were conducted using SPSS version 25.0 (SPSS, Inc., Chicago, IL, USA). Descriptive statistics were used to describe participants' sociodemographic and clinical data. As none of the sociodemographic and clinical variables showed significant associations with any of the dependent variables, these were not included in further analyses.

The mediation analyses were conducted using the MEMORE macro [47], a tool similar to PROCESS (Hayes, 2018), but designed to test mediation models in repeated measures designs. This macro calculates the independent variable (IV) effect (patient SES) on the dependent variable(s) (DVs), as well as the mediation effects, also called indirect effects, by subtracting the values of the repeated measures considering their insertion order. In the present study, the low SES condition was always introduced first (e.g., $LowSES_{PainIntensity} - HighSES_{PainIntensity} = Patient\ SES\ effect$). For these analyses, unstandardized coefficients (B) were reported to indicate the relative strengths of mediation relationships. MEMORE generates confidence intervals for inference about the indirect effect(s). A 95% bootstrap CI with 5000 resamples was used to determine whether these mediation effects were significant (when the CI did not include zero). As we were interested in exploring the unique and specific contribution of each mediator, mediation models we performed for each mediator separately, assuming a significance level of .05.

2.2. Study 2

2.2.1. Participants

As in study 1, data were collected online but conducted with Portuguese registered nurses. Of the 228 online answers obtained, 99 were excluded, mostly because they were incomplete (n=94, 41.22%), or participants were not Portuguese (n=4) or registered nurses (n=1). Again, as to control for confounds between participant/patient sex and patient SES, only female nurses were included in the sample (24 male nurses were excluded).

The final sample included 105 female nurses, aged between 22 and 61 years old ($Q_1=28$; $Q_2=33$; $Q_3=38$; $M=34.65$; $SD = 8.48$). One third of the nurses were married (40%) or lived with a romantic partner (21%), 35.2% were single, and 3.8% were divorced. Their professional experience ranged between a few months to 40 years ($M=11.39$ years; $SD= 8.88$). Beyond their graduation on nursery, 40% had a specialty degree, 30.5% had a post-graduation and 18.1% a master's degree. Twenty-five nurses (23.8%) were working and studying simultaneously. Most nurses worked in a hospital setting (69.5%), followed by primary health care centers (9.5%), nursing homes (5.7%) and continuing care units (3.8%). Almost three quarters reported having regular professional contact with chronic pain patients (72.4%). About 41% of the participants reported having or having had pain for more than three consecutive months, of which 16.2% mentioned that it was still an ongoing pain, felt daily (21%) or three times per week (6.7%) and with an average intensity of 5.30 ($SD=1.74$) on a scale ranging from 0 to 10. Most common pain sites were back pain, head, and abdomen.

2.2.2. Experimental Design and Independent variable

Similar to study 1.

2.2.3. Mediators

Dehumanization. The same trait-based measure of dehumanization described in study 1 was used. Good internal consistency indices were obtained for the mechanistic dehumanization scale ($\alpha_{\text{LowSES}} = .79$; $\alpha_{\text{HighSES}} = .83$) and animalistic dehumanization scale ($\alpha_{\text{LowSES}} = .86$; $\alpha_{\text{HighSES}} = .82$).

Perceived Life Hardship. The same measure of perceived life hardship described in study 1 was used. Acceptable to good internal consistency indices were obtained ($\alpha_{\text{LowSES}} = .69$; $\alpha_{\text{HighSES}} = .77$).

2.2.4. Dependent variables

Pain assessment. The same measures reported in study 1 were used. In this sample, excellent internal consistency indices were found for the following subscales: pain disability ($r_{\text{sb}} = .90$ for High/Low SES), pain credibility ($r_{\text{sb}} = .92/.96$ for high/Low SES) and psychological attributions ($r_{\text{sb}} = .95/.93$ for high/Low SES).

Pain management. As in study 1, nurses were asked to rate their intentions of offering individualized care to each patient. Very good internal consistency indices were found for the Clinical Situation subscale ($\alpha = .91/.94$ for Low/High SES) and the Decisional Control subscale ($\alpha = .85/.89$ for Low/High SES).

2.2.5. Procedure

Data were collected using the online software program Qualtrics®. Nursing schools and public/private hospitals were contacted and asked to send a recruitment e-mail to their *alumni/nurses* mailing lists inviting them to participate in a study about decision-making

processes in clinical contexts. Recruitment was also made via mailing lists of different Portuguese Registered Nurses Associations. The study was approved by the Boards of Directors of the participating institutions.

The information on the study's aims and the structure and contents of the online protocol were very much like the ones described in study 1. The following sociodemographic and clinical data were collected: sex, age, nationality, civil status, parent's level of education, nursing degree and specialty, years of professional experience, work status, professional, personal and vicarious experience with chronic pain. The time required to complete the protocol was on average 23 minutes. One 25€ gift voucher was drawn at random among those who left their emails for being compensated for their participation. Also, participants were thanked, debriefed and the ones who were interested in knowing more about the study submitted their email address.

2.2.6. Data analysis

Data analysis procedures were the same as described in study 1. Again, as none of the sociodemographic and clinical variables showed significant associations with any of the dependent variables, these were not included in further analyses.

3. Results

3.1. Study 1

3.1.1. Manipulation check

Of the 162 female medical students, 46 were excluded as they were not able to correctly recall/perceive the information presented in at least one of the clinical scenarios,

namely, patients' age ($n=7$), patients' profession ($n=8$), pain duration ($n= 8$) and patients' SES ($n= 23$). This subsample of excluded participants did not significantly differ in their sociodemographic and clinical characteristics from the remaining sample. Finally, analyses showed that the remaining participants ($n=116$, 71.60%) rated the patient in the Low SES condition as occupying a much lower rung in the social ladder ($M= 3.92$; $SD=.83$) than the High SES patient ($M= 8.10$; $SD= .99$; $t_{(115)} = -36.69$, $p = .001$), thus confirming the manipulation of our independent variable.

3.1.2. Total effects of patient SES on pain assessment and management practices

As shown in Tables 1, 2 and 3, patient SES had small but significant total effects on all outcome variables ($.02 < B_s < .52$), except for Psychological attributions and Psychoeducational Recommendations. Compared to the High SES patient, medical students rated the Low SES patient as having slightly lower pain intensity during movement but perceived her as more credible and with higher pain-related disability. Medical students also reported being slightly less willing to recommend non-pharmacological treatment or to offer individualized care to the Low SES patient, either by acknowledging her individual perspective regarding the clinical situation or sharing decisional control. Finally, students were slightly more willing to prescribe stronger pharmacological treatment to the Low SES patient.

3.1.3. The mediating role of dehumanization

As indicated in Table 1, large negative effects were found of patient SES on mechanistic dehumanization ($B_s > -.685$), showing that the High SES patient was perceived as much more machine-like than the Low SES patient. However, mechanistic dehumanization only

significantly predicted pain disability; more mechanistic dehumanization was associated with lower perceived pain disability (BootSE = .142, 95% CI = 0.003, 0.551; $t(111) = -2.62, p = .01$). Indeed, mechanistic dehumanization significantly accounted for the patient SES effect on pain disability. Overall, the mediation model accounted for 7% of the variance of perceived pain disability.

As shown in Table 2, large positive effects of patient SES on animalistic dehumanization were found ($Bs > .496$), suggesting that the Low SES patient was perceived as more animal-like than the High SES patient. Animalistic dehumanization, however, did not significantly predict any of the outcome variables, hence, not accounting for the previously reported SES effects.

3.1.4. The mediating role of perceived life hardship

Table 3 shows that patient SES had a very strong effect on perceived life hardship ($Bs > .748$); the Low SES patient was perceived as having a much harder and less privileged life than the High SES patient. However, perceived life hardship only significantly predicted pain disability; increased life hardship was associated with increased pain-related disability (BootSE = .138, 95% CI = 0.141, 0.672; $t_{(112)} = 3.42, p = .001$). Indeed, perceived life hardship totally accounted for the effects of patient SES on pain disability. Overall, this mediation model accounted for 11% of the variance of pain disability assessment.

Table 1 - Total, direct and indirect effects of patient SES on medical students' assessment/management practices via mechanistic dehumanization (study1).

			Outcome Variables (O)								
			Pain Intensity	Pain Disability	Pain Credibility	Psychological Attributions	Clinical Situation	Decisional Control	NPharR	PsyR	PharR
Mediator (Med): Mechanistic Dehumanization	Total effect	B	-.127***	.509***	.155***	-.004	-.024***	-.032***	-.061***	-.018	.097***
	SES on Med	B	-.707***	-.695***	-.706***	-.686***	-.695***	-.685***	-.695***	-.695***	-.695***
	Med on O	B	-.137	-.389**	-.117	-.024	.029	-.012	.073	.060	-.105
	Direct effect	B	-.224	.238	.072	-.021	-.004	-.040	-.011	.024	.023
	Indirect effect	B	.097	.271	.083	.017	-.020	.008	-.051	-.042	.073
	effect	95%CI	[-.292;.460]	[.001;.551]	[-.096;.258]	[-.085;.130]	[-.058;.022]	[-.029;.047]	[-.187;.090]	[-.211;.125]	[-.070;.215]
	Model	F	.559	4.290	.591	.397	.705	.334	1.174	.156	.673
	Summary	R ²	.010	.072*	.011	.007	.013	.006	.021	.003	.012
	N	110	114	113	113	114	112	114	114	114	
M	Low SES		5.21 (1.82)	4.92 (1.02)	5.15 (.96)	3.31 (.89)	4.43 (.53)	4.41 (.55)	5.40 (1.05)	3.76 (1.33)	2.82 (.78)
(SD)	Hight SES		5.34 (1.73)	4.42 (1.06)	4.99 (1.09)	3.33 (.99)	4.45 (.53)	4.44 (.55)	5.46 (1.07)	3.78 (1.30)	2.73 (.82)

CI = Confidence Interval; * $p = .016$; ** $p = .01$ *** $p = .001$; M = Mean; SD = standard deviation; NPharR = non-pharmacological recommendations; PsyR = psychoeducational recommendations; PharR = Pharmacological recommendations.

Table 2 - Total, direct and indirect effects of patient SES on medical students' assessment/management via animalistic dehumanization (study 1).

			Outcome Variables (O)								
			Pain Intensity	Pain Disability	Pain Credibility	Psychological Attributions	Clinical Situation	Decisional Control	NPharR	PsyR	PharR
Mediator (M): Animalistic Dehumanization	Total effect	B	-.110***	.518***	.174***	-.005	-.024***	-.032***	-.062***	-.018	.097***
	SES on M	B	.498***	.502***	.500***	.496***	.502***	.497***	.502***	.502***	.502***
	M on O	B	.128	.049	.019	.115	.005	-.011	.026	.158	-.099
	Direct effect	B	-.174	.493**	.165	-.061	-.026	-.027	-.075	-.097	.147
	Indirect effect	B	.064	.025	.010	.057	.002	-.006	.013	.079	-.050
		95%CI	[-.218;.422]	[-.137;.204]	[-.148;.148]	[-.085;.203]	[-.031;.037]	[-.045;.029]	[-.097;.118]	[-.091;.228]	[-.175;.081]
	Model	F	.339	.317	.035	1.255	.110	.139	.723	.869	.462
	Summary	R ²	.008	.006	.001	.023	.002	.003	.013	.016	.008
		N	109	113	112	112	113	111	113	113	113
	M	Low SES		5.22 (1.83)	4.92 (1.02)	5.15 (.96)	3.33 (.90)	4.43 (.53)	4.40 (.55)	5.41 (1.06)	3.77 (1.33)
(SD)	High SES		5.33 (1.73)	4.40 (1.06)	4.97 (1.07)	3.33 (.98)	4.45 (.53)	4.43 (.55)	5.47 (1.08)	3.79 (1.31)	2.73 (.83)

CI = Confidence Interval; ** p = .005 *** p = .001; M = Mean; SD = standard deviation; NPharR = non-pharmacological recommendations; PsyR = psychoeducational recommendations; PharR = Pharmacological recommendations

Table 3 - Total, direct and indirect effects of patient SES on medical students' pain assessment and management via perceived life hardship (study 1).

			Outcome Variables (O)								
			Pain Intensity	Pain Disability	Pain Credibility	Psychological Attributions	Clinical Situation	Decisional Control	NPharR	PsyR	PharR
Mediator (Med): Perceived Life Hardship	Total effect	B	-.099***	.522***	.162***	-.018	-.025***	-.030***	-.052***	-.017	.113***
	SES on Med	B	.773***	.754***	.763***	.750***	.754***	.748***	.754***	.754***	.754***
	Med on O	B	.427	.532***	.055	.065	-.026	.012	-.003	-.151	-.004
	Direct effect	B	-.429	.121	.120	-.066	-.006	-.039	-.048	.096	.116
	Indirect effect	B	.330	.401	.042	.049	-.019	.009	-.004	-.114	-.003
	effect	95%CI	[-.019;.693]	 [.141;.672]	[-.120;.193]	[-.057;.161]	[-.060;.019]	[-.018;.039]	[-.150;.134]	[-.290;.059]	[-.155;.145]
	Model	F	1.57	6.63	.868	.589	.626	.152	.002	1.197	.158
	Summary	R ²	.028	.106**	.015	.011	.011	.033	.000	.021	.003
	N	111	115	114	114	115	113	115	115	115	
M (SD)	Low SES		5.21 (1.81)	4.93 (1.02)	5.15 (.96)	3.32 (.90)	4.43 (.53)	4.40 (.55)	5.41 (1.05)	3.76 (1.32)	2.83 (.78)
	High SES		5.31 (1.75)	4.41 (1.06)	4.99 (1.08)	3.33 (.98)	4.45 (.53)	4.43 (.55)	5.46 (1.07)	3.77 (1.30)	2.71 (.84)

CI = Confidence Interval; ** $p = .002$; *** $p = .001$; M = Mean; SD = standard deviation; NPharR = non-pharmacological recommendations; PsyR = psychoeducational recommendations; PharR = Pharmacological recommendations

3.1.5. Conclusions

Patient SES slightly influenced medical students' PAMP, but not always confirming our hypothesis 1, which predicted that the Low SES patient's pain would be underassessed/managed as compared to the High SES patient's pain. Confirming this hypothesis, the Low SES patient's pain was assessed as less intense [11,53] and medical students were slightly less willing to provide her individualized care and recommend her non-pharmacological treatments requiring, to some extent, self-management skills (e.g., walking, massage) [19,30]. However, the Low SES patient's pain was perceived as more disabling [19,30], more credible and medical students were more willing to prescribe her slightly stronger pain medication (which nonetheless did not include opioids).

The mediation models only partially supported our hypotheses 2 and 3. As expected, the Low SES patient's life was perceived as much harder than the High SES patient's life [38,39]. Also consistent with our expectations, the Low SES patient was perceived as more animal-like [21,40] and the High SES patient as more machine-like [25,27]. However, perceived life hardship and mechanistic dehumanization (but not animalistic dehumanization) were mediating mechanisms accounting for patient SES effects on pain disability assessments only. More specifically, medical students perceived the Low SES patient as being more disabled by pain than the High SES patient. This effect was accounted for by perceptions of the Low SES patient as having a harder, less privileged life and being less machine-like, hence, potentially less capable of managing pain interference.

3.2. Study 2

3.2.1. Manipulation checks

Thirty-nine nurses were excluded from the initial sample as they were not able to correctly recall/perceive the information presented in at least one of the clinical scenarios, namely, patient's age (n=2), patient's profession (n=7), pain duration (n= 14) and patients' SES (n= 16). The remaining sample consisted of 66 (62.9%) female nurses. The excluded subsample did not significantly differ in their sociodemographic and clinical characteristics from the remaining sample. Finally, analyses showed that the remaining participants rated the patient in the Low SES condition as occupying a much lower rung in the social ladder (M= 3.45; SD=1.00) than the High SES patient (M= 8.20; SD= 1.10; $t_{(65)} = -27.18, p = .001$), thus confirming the manipulation of our independent variable.

3.2.2. Total effects of Patient SES on pain assessment and management practices

The total effects of patient SES on nurses' PAMP are displayed in Tables 4, 5 and 6. Although patient SES did not significantly predict pain intensity assessments, it significantly predicted all other outcome variables ($-.226 < \beta < .438$). More specifically, findings showed that, as compared to the High SES patient, the Low SES patient was perceived as being more disabled by pain, her pain complaints were slightly less attributed to psychological factors and were more credible. Nurses also reported being slightly more willing to offer individualized care to the Low SES patient, both by acknowledging her individual perspective regarding the clinical situation and by sharing decisional control.

3.2.3. The mediating role of dehumanization

As indicated in Table 4, large negative effect sizes were found of patient SES on mechanistic dehumanization ($-.869 > \beta > -.853$); as in study 1, the High SES patient was

perceived as much more machine-like than the Low SES patient. No significant associations were found between mechanistic dehumanization and any of the outcome variables. No significant indirect effects of patient SES on PAMP were found via mechanistic dehumanization.

As shown in Table 5, moderate effects were found of patient SES on animalistic dehumanization (.419 > B_s > .456); as in study 1, the Low SES patient was perceived as more animal-like than the High SES patient. Animalistic dehumanization only showed a significant effect on pain credibility (BootSE = .125, 95% CI = 0.004, 0.732; $t_{(60)}=2.02$, $p = .048$); higher animalistic dehumanization predicted higher pain credibility. However, despite the loss of significance of the effect of patient SES on pain credibility after controlling for animalistic dehumanization (direct effect), the indirect effect was not significant. Hence, the mediating role of animalistic dehumanization on the effect of patient SES on pain credibility was not confirmed. Overall, this model accounted for 17.4% of the variance. Animalistic dehumanization did not significantly predict any of the remaining outcome variables, hence, not accounting for the previously reported SES effects on those variables.

3.2.4. The mediating role of perceived life hardship

Table 6 shows that patient SES had a strong effect on perceived life hardship ($B_s > .923$); as in study 1, the low SES patient was perceived as having a much harder and less privileged life than the high SES patient. However, perceived life hardship only significantly predicted nurses' assessment of pain credibility; increased life hardship was associated to increased pain credibility (BootSE = .195, 95% CI = 0.024, 0.798; $t_{(61)}=2.32$, $p = .024$). In turn, perceived life hardship totally accounted for the effects of SES on pain credibility. Overall, the mediation model accounted for 16.1% of the variance. There was also a very small indirect effect of

patient SES on the intention to share decisional control via perceived life hardship, but the overall model was not significant.

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Table 4 - Total, direct and indirect effects of patient SES on nurses' pain assessment/management via mechanistic dehumanization (study 2).

		Outcome Variables (O)						
		Pain Intensity	Pain Disability	Pain Credibility	Psychological Attributions	Clinical Situation	Decisional Control	
Mediator (Med): Mechanistic Dehumanization	Total effect	B	.016	.429***	.250***	-.226***	.088***	.086***
	SES on Med	B	-.869***	-.853***	-.867***	-.867***	-.853***	-.853***
	Med on O	B	.290	.059	.110	-.050	-.013	-.086
	Direct effect	B	.269	.479	.346	-.269	.078	.012
	Indirect effect	B	-.252	-.050	-.096	.043	.011	.074
	effect	95%CI	[-.865; .360]	[-0.439; .327]	[-.414; .244]	[-.237;.263]	[-.071; .106]	[-0.010; .187]
	Model	F	1.30	.258	1.87	.216	.107	1.97
	Summary	R ²	.043	.009	.060	.007	.004	.062
		N	61	63	62	62	63	63
	M	Low SES	5.07 (1.82)	4.94 (1.08)	5.15 (1.07)	3.28 (.99)	4.36 (.53)	4.49 (.46)
(SD)	High SES	5.05 (2.10)	4.51 (1.14)	4.90 (1.19)	3.51 (1.31)	4.27 (.65)	4.41 (.64)	

CI = Confidence Interval; *** $p = .001$; M = Mean; SD = standard deviation

Table 5 - Total, direct and indirect effects of patient SES on nurses' pain assessment/management via animalistic dehumanization (study 2).

		Outcome Variables (O)						
		Pain Intensity	Pain Disability	Pain Credibility	Psychological Attributions	Clinical Situation	Decisional Control	
Mediator (Med): Animalistic Dehumanization	Total effect	B	.016	.422***	.246***	-.238***	.083***	.081***
	SES on Med	B	.419***	.449***	.456***	.456***	.449***	.449***
	Med on O	B	.739	.408	.368*	.232	.043	-.012
	Direct effect	B	-.294	.239	.078	-.344***	.063	.087
	Indirect effect	B	.310	.183	.168	.106	.019	-.005
	effect	95% CI	[-0.081; .788]	[-.079; .504]	[-.031; .443]	[-.074; .329]	[-.010; .054]	[-.043; .028]
	Model	F	4.26*	3.33^{††}	6.32**	1.12	1.21	.633
	Summary	R ²	.126	.098	.174	.036	.038	.020
		N	62	64	63	63	63	64
	M	Low SES	5.05 (1.81)	4.92 (1.08)	5.13 (1.07)	3.28 (.99)	4.35 (.54)	4.48 (.46)
(SD)	High SES	5.03 (2.09)	4.50 (1.13)	4.89 (1.19)	3.52 (1.30)	4.26 (.65)	4.40 (.64)	

CI = Confidence Interval; ^{††}p= .04; ^{†††}p=.03; *p = .02; **p=.003; ***p = .001; M = Mean; SD = standard deviation

Table 6 - Total, direct and indirect effects of patient SES on nurses' pain assessment and management practices via perceived life hardship (study 2).

		Outcome Variables (O)						
		Pain	Intensity	Pain Disability	Pain Credibility	Psychological Attributions	Clinical Situation	Decisional Control
Mediator (Med): Perceived Life Hardship	Total effect	B	.065	.438***	.289***	-.219***	.070***	.081***
	SES on Med	B	.932***	.926***	.923***	.923***	.929***	.926***
	Med on O	B	.265	.445	.446*	.318	.054	.093
	Direct effect	B	-.183	.026	-.124	-.513*	.020	-.005
	Indirect effect	B	.247	.412	.413	.294	.050	.086
	95%CI		[-.634;1.102]	[-.089; .904]	[.024; .798]	[-.031; .618]	[-.022; 0.128]	[.007; .193]
	F		3.10	2.33	5.85	1.79	1.03	1.28
	R ²		.095[†]	.071	.161**	.055	.033	.040
	N		62	64	64	64	63	64
	M (SD)	Low SES		5.08 (1.77)	4.96 (1.04)	5.18 (1.03)	3.26 (.98)	4.35 (.53)
High SES			5.02 (2.10)	4.52 (1.14)	4.89 (1.17)	3.48 (1.33)	4.28 (.63)	4.42 (.64)

CI = Confidence Interval; [†]*p* = .05; **p* = .02; ***p* = .005; ****p* = .001; M = Mean; SD = standard deviation.

3.2.5. Conclusions

These findings showed that patient SES influenced nurses' PAMP. However, contrary to our expectations (hypothesis 1), the High SES patient's pain was consistently under-assessed/managed as compared to the Low SES patient's pain. As in previous studies (including study 1), the low SES patient's pain was assessed as more disabling and more credible [19,30]. Her pain was also less attributed to psychological factors and nurses were slightly more willing to offer her individualized care.

Once again, the Low SES patient was perceived as having a less privileged life [38,39] and being more animal-like than the High SES patient [21,40], whereas the latter was perceived as more machine-like [25,27]. Contrary to our hypothesis 2, neither mechanistic nor animalistic dehumanization were mechanisms accounting for patient SES effects on nurses' PAMP. Partially confirming our hypothesis 3, perceived life hardship was a relevant mediating mechanism. More specifically, nurses perceived the Low SES patient's pain as more credible and showed a tendency to share more decisional control with her; these effects were accounted for by perceiving the Low SES patient as having a harder, less privileged life.

4. Discussion

This paper tested the effect of patient SES on medical students' and nurses' pain assessment and management practices (PAMP) and investigated two potential mediating mechanisms – patient dehumanization and life hardship.

Our first hypothesis predicted that the Low SES patient's pain would be underassessed/managed compared to the High SES patient's pain. This hypothesis was only partially supported. Concerning pain assessments, the Low SES patient was perceived as “less sensitive to pain but more disabled” than the High SES patient. In line with former studies, the Low SES patient was perceived as feeling slightly less intense pain [11,53] (by medical students only) when displaying a pain-inducing movement, but her pain was consistently perceived (in both samples) as more disabling [19,30]. Moreover, the Low SES patient's pain complaints were perceived as more credible (across samples) and less attributed to psychological causes (by nurses only). These findings are apparently at odds with former evidence showing that nurses perceived the High SES woman's pain as more credible and less attributed to psychological causes [11] than the Low SES woman's pain. Such apparent inconsistency may, however, be accounted for by distress cues, which were present in our previous study [11] but absent in the current studies. Many studies have shown that the degree to which women's pains are psychologized depends on the level of distress associated to their pain complaints [8,49]. None of these studies, however, have considered the intersection of social class and gender biases. Possibly, the presence of distress cues may hamper the credibility of the pain complaints of women of low/middle SES but may increase the credibility of the pain reports of women of high SES, eventually by humanizing them or making them more typically feminine. This contention remains to be tested.

The effects of patient SES on pain management were much less pronounced. Contrary to previous studies [19,30,32,48], medical students did not recommend more psychoeducational counselling to the Low SES patient. However, they were slightly less willing to recommend non-pharmacological treatments (e.g., walking, massage) and more willing to prescribe slightly stronger medication, which, nonetheless, did not include opioids. This pattern again supports the notion that providers are less willing to recommend pain treatments involving an active role of Low SES patients in self-care, possibly because they expect them to be less competent to take on that role [19,30]. Indeed, medical students were slightly less willing to acknowledge the Low SES woman's perspective on her clinical situation and to share decisional control. Nurses, however, showed the opposite trend. They consistently underassessed/managed the High SES woman's pain compared to the Low SES woman's pain, which disconfirms hypothesis 1. As mentioned in the introduction, health-care training and profession social status may account for these group differences. Nurses, by usually being more oriented towards patient care (vs. cure) than physicians/medical students, are more willing to integrate psychosocial factors in their appraisals of clinical situations [6,15], which could explain their perceptions of the Low SES woman's pain as more severe, credible, and deserving more individualized care. Also, as in most societies doctors are considered of higher social status [37,42], our findings may be reflecting an in-group favouritism bias, *i.e.*, the tendency to favour members of one's own group than those of other groups [23]. This being true, it could explain the dominant pattern in the literature suggesting the underassessment/treatment of lower SES individuals' pain, as most studies have been conducted with physicians [16,28,30-32,48] and only a few with nurses [11,19].

Concerning our mediation hypotheses, the mediating role of patient dehumanization received inconsistent support (hypothesis 2). In line with the literature, the Low SES woman was animalistically dehumanized [21,40], *i.e.*, she was perceived as having traits shared by other animals but not by objects/machines. Conversely, and as expected, the High SES woman was mechanistically dehumanized [25,27], *i.e.*, she was perceived as having traits not shared by other animals but that could, to some extent, characterize machines. The more nurses perceived the patient as animal-like the more they trusted her pain complaints and tended to perceive her as more pain sensitive and disabled. These novel findings are in line with dehumanization theories [25,27]; like humans, animals can experience pain but are perceived as less competent to manage pain-related life interference and control (or fake) pain expressions. Indeed, one of our previous studies with nurses has supported this association between patient animality and pain disability [19]. Animalistic dehumanization, however, played no mediating role on PAMP, overall. Conversely, medical students perceived the High SES woman as less disabled than the Low SES woman as they perceived her as more machine-like. Again, this novel finding is in line with dehumanization theories; perceiving a patient as more machine-like is denying her experiential depth and granting her rationality and self-control, which are traits associated to an increased capacity to self-manage pain [19]. The reason as to why animalistic dehumanization had a stronger influence on nurses' PAMP and mechanistic dehumanization a more central role on medical students' PAMP is yet unclear.

Our third hypothesis regarding the mediating role of perceived life hardship was partially confirmed. Overall and unsurprisingly, the Low SES woman was perceived as having a much harder and less privileged life than the High SES woman [21,38,39]; consequently, medical students perceived the former as more disabled and nurses assessed her pain complaints as more

credible, being slightly more inclined to share decisional control. Previous findings showed that perceived life hardship accounted for laypeople's race biases in pain sensitivity assessments [53]. Our results go beyond these findings, showing that perceived life hardship also accounts for providers' classism in PAMP.

4.1. Limitations, future directions for research and contributions

These studies have some limitations that may inform future research directions. First, our effects sizes are small and whether they bear clinical significance is uncertain. Such small effects sizes may exist because patient SES was exclusively manipulated by her education and profession, while controlling for other vital cues for social class categorization in real clinical scenarios (e.g., language, physical appearance, body posture, demeanor) [34]. Social class recognition and categorization in real settings is much more complex than that of sex or race. It is often based on the simultaneous interpretation of multiple cues [34], which is harder to operationalize in experimental designs while keeping strong construct and ecological validity. Indeed, one of our previous mixed-method studies showed that nurses' unguided recognition patients' SES bears more pronounced associations with pain assessments [19]. It is also noteworthy to mention that our experimental paradigm does not capture the complex dynamics that may underlie pain management decisions made by clinical teams. Moreover, despite our cover story and efforts to vary and counterbalance the written/visual information in the scenarios, within-subject designs increase the likelihood of hypothesis guessing, potentially contributing to suppressing the SES effects. Therefore, the future triangulation of study designs and methodologies may prove particularly useful to grasp the complexities of classism in PAMP in real clinical contexts.

Second, our effect sizes may have also been tapered down by presenting patients with moderate pain intensity and using positive-valency dehumanization traits. Higher levels of pain intensity increase the ambiguity of the clinical situation and, hence, the likelihood of assessment biases [44]. Moreover, although the use of negative-valency traits to assess dehumanization (e.g., cold/superficial vs. passive/simple-minded) [14] would increase the influence of social desirability, it could also have shown more pronounced effects on PAMP. Future studies are needed to investigate conditions that may enhance/suppress classism in pain care but also further explore the mediating role of dehumanization processes. Furthermore, the causal relations between dehumanization (and life hardship) and PAMP could be tested in future experimental studies, as in our current studies the relation between mediators and outcomes was merely correlational.

Third, the studies have only compared Low vs. High SES women. Whether the similar results would be found if we had compared Low vs. Middle SES or Middle vs. High SES women is unknown. It is quite possible that the effects of patient SES on PAMP are not linear. Moreover, to control for confounds between social class and gender, our studies focused exclusively on female patient-female provider dyads. As the class-belief system intersects with gender beliefs influencing health [50], generalizations of our findings to male-to-male or sex/gender-discordant dyads should be taken with caution and further investigated with more complex study designs. Moreover, although no differences were found between participants who correctly vs. incorrectly recalled manipulations checks, given the attrition rates, cautious generalizations to female-to-female dyads are also recommended.

Despite these limitations, our findings have several important and novel contributions not only to the field of pain research, but also health service research and social psychology.

To pain researchers, these studies show that social class matters in pain decoding and uncover some of the psychosocial processes underlying classism in pain care. To health service researchers, predominantly focused on the interpersonal, organizational, and technical aspects of patient-centered care [18], these studies stress the relevance of considering upstream psychosocial processes (class-based beliefs, dehumanization) that may underlie such practices. To social psychologists, these findings extend the knowledge on dehumanization processes by focusing on class-based interpersonal processes in clinical encounters.

Overall, the knowledge produced herein may have important contributions to the development of more effective future interventions to reduce providers' classism PAMP [28]. Indeed, integrating this knowledge on health-care providers' training modules may contribute to enhance their diversity sensitivity, promoting equity and humanization in pain care.

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6. References

- [1] Adler NE, Epel ES, Castellazzo G, Ickovics JR. Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy white women. *Health Psychol* 2000;19:586-592.
- [2] Antunes D, Batuca C, Ramos A, Fonseca C, Ferreira M, Suhonen R, Sousa V. International Cross-Cultural Comparative Study on Perceptions of Nurses in relation to the Individualized Nursing care. *Rev Invest Enferm* 2011;24:7-15.
- [3] Azevedo L, Costa-Pereira A, Mendonça L, Dias C, Castro-Lopes J. Epidemiology of chronic pain: a population-based nationwide study on its prevalence, characteristics and associated disability in Portugal. *J Pain* 2012;13:773-783.
- [4] Azevedo L, Costa-Pereira A, Mendonça L, Dias C, Castro-Lopes J. The economic impact of chronic pain: a nationwide population-based cost-of-illness study in Portugal. *Eur J Health Econ* 2016;17:87-98.
- [5] Bastian B, Haslam N. Excluded from humanity: The dehumanizing effects of social ostracism. *J Exp Soc Psych* 2010; 46:107–113.
- [6] Baumann AO, Deber RB, Silverman BE, Mallette CM. Who cares? Who cures? The ongoing debate in the provision of health care. *J Clin Nursing* 1998;28:1040-1045.
- [7] Bernardes SF, Costa M, Carvalho H. Engendering pain management practices: the role of physician sex on chronic low-back pain assessment and treatment prescriptions. *J Pain* 2013;14:931-940.

[8] Bernardes SF, Keogh E, Lima ML. Bridging the gap between pain and gender research: a selective literature review. *Eur J Pain* 2008;12:427-440.

[9] Bernardes SF, Lima ML. A contextual approach on sex-related biases in pain judgements: the moderator effects of evidence of pathology and patients' distress cues on nurses' judgements of chronic low-back pain. *Psychol Health* 2011;26:1642-1658.

[10] Bonathan C, Hearn L, Williams, A. Socioeconomic status and the course and consequences of chronic pain. *Pain Manag* 2013;3:159-162.

[11] Brandão T, Campos L, De Ruddere L, Goubert L, Bernardes SF. Classism in Pain Care: The Role of Patient Socioeconomic Status on Nurses' Pain Assessment and Management Practices. *Pain Med* 2019;20:2094-2105.

[12] Breivik H, Collett B, Ventafridda V, Cohen R, Gallacher D. Survey of chronic pain in Europe: prevalence, impact on daily life, and treatment. *Eur J Pain* 2006;10:287-333.

[13] Breivik H, Eisenberg E., O'Brien T. The individual and societal burden of chronic pain in Europe: the case for strategic prioritisation and action to improve knowledge and availability of appropriate care. *BMC Public Health* 2013;24:1229.

[14] Campos L, Louceiro A, Brandão T, Bernardes S. Trait-based measure of dehumanization: adaptation for the Portuguese population. *Psicologia* 2020;34:214-228.

[15] Choudhury D, Nortjé N. The hidden curriculum and integrating cure- and care-based approaches to medicine. *HEC Forum* 2020; Available at: <https://doi.org/10.1007/s10730-020-09424-6> Accessed: 20 Feb 2021.

[16] Chu MK, Buse DC, Bigal ME, Serrano D, Lipton RB. Factors associated with triptan use in episodic migraine: results from the American Migraine Prevalence and Prevention Study. *Headache* 2012;52:213-23.

[17] De Ruddere L, Goubert L, Stevens M, Williams A, Crombez G. Discounting pain in the absence of medical evidence is explained by negative evaluation of the patient. *Pain* 2013;154:669-679.

[18] Diniz E, Bernardes SF, Castro P. Self- and Other-Dehumanization Processes in Health-Related Contexts: A Critical Review of the Literature. *Rev Gen Psychol* 2019;23:475-495.

[19] Diniz E, Castro P, Bousfield A, Bernardes SF. Classism and dehumanization in chronic pain: A qualitative study of nurses' inferences about women of different socio-economic status. *Br J Health Psychol* 2020;25:152-170.

[20] Dodge N, Chapman R. Investigating recruitment and completion mode biases in online and door to door electronic surveys. *Int J Soc Res Method* 2018;21:149-163.

[21] Durante F, Fiske ST, Kervyn N, Cuddy AJ, Akande AD, Adetoun BE, Adewuyi MF, Tserere MM, Ramiah AA, Mastor KA, Barlow FK, Bonn G, Tafarodi RW, Bosak J, Cairns E, Doherty C, Capozza D, Chandran A, Chrysochoou X, Iatridis T, Contreras JM, Costa-Lopes R, González R, Lewis JI, Tushabe G, Leyens JP, Mayorga R, Rouhana NN, Castro VS, Perez R, Rodríguez-Bailón R, Moya M, Morales Marente E, Palacios Gálvez M, Sibley CG, Asbrock F, Storari CC. Nations' income inequality predicts ambivalence in stereotype content: how societies mind the gap. *Br J Soc Psychol* 2013;52:726-46.

[22] Dworkin RH, Turk DC, Farrar JT, Haythornthwaite JA, Jensen MP, Katz N, Kerns RD, Stucki G, Allen RR, Bellamy N, Carr DB, Chandler J, Cowan P, Dionne R, Galer BS, Hertz S, Jadad AR,

Kramer LD, Manning DC, Martin S, McCormick CG, McDermott MP, McGrath P, Quessy S, Rappaport BA, Robbins W, Robinson JP, Rothman M, Royal MA, Simon L, Stauffer JW, Stein W, Tollett J, Wernicke J, Witter J, IMMPACT. Core outcome measures for chronic pain clinical trials: IMMPACT recommendations. *Pain* 2005;113:9-19.

[23] Everett JAC, Faber NS, Crockett M. Preferences and beliefs in ingroup favouritism. *Front Behav Neurosci* 2015;9: doi: 10.3389/fnbeh.2015.00015

[24] Galobardes B, Shaw M, Lawlor DA, Lynch JW, Smith GD. Indicators of socioeconomic position (part 1). *J Epidemiol Community Health* 2006; 60: 7-12.

[25] Haslam N. Dehumanization: an integrative review. *Pers Soc Psychol Rev* 2006;10:252-264.

[26] Haslam N, Bain P. Humanizing the self: Moderators of the attribution of lesser humanness to others. *Pers Soc Psych Bull* 2007;33: 57-68.

[27] Haslam N, Loughnan S. Dehumanization and inhumanization. *Annu Rev Psychol* 2014;65:399-423.

[28] Hirsh AT, Miller MM, Hollingshead NA, Anastas T, Carnell ST, Lok BC, Chu C, Zhang Y, Robinson ME, Kroenke K, Ashburn-Nardo L. A randomized controlled trial testing a virtual perspective-taking intervention to reduce race and socioeconomic status disparities in pain care. *Pain* 2019;160:2229-2240.

[29] Hoffman KM, Trawalter S. Assumptions about life hardship and pain perception. *Group Process Intergroup Relat* 2016;19:493-508.

[30] Hollingshead NA, Matthias MS, Bair M, Hirsh AT. Healthcare providers' perceptions of socioeconomically disadvantaged patients with chronic pain: A qualitative investigation. *J Health Dispar Res Pract* 2016;9:35-44.

[31] Ji GY, Oh CH, Jung NY, An SD, Choi WS, Kim JH. Interference of detection rate of lumbar disc herniation by socioeconomic status. *Asian Spine J* 2013;7:14-9.

[32] Joynt M, Train MK, Robbins BW, Halterman JS, Caiola E, Fortuna RJ. The impact of neighbourhood socioeconomic status and race on the prescribing of opioids in emergency departments throughout the United States. *J Gen Intern Med* 2013;28:1604-1610.

[33] Kenny DA. MedPower: An interactive tool for the estimation of power in tests of mediation [Computer software] 2017; Feb. Available:

<https://davidakenny.shinyapps.io/MedPower/> Accessed: 10 Feb 2021.

[34] Kraus MW, Park JW, Tan JJX. Signs of Social Class: The Experience of Economic Inequality in Everyday Life. *Perspect Psychol Sci* 2017;12:422-435.

[35] Krieger N. A glossary for social epidemiology. *J Epidemiol Community Health* 2001; 55: 693-700.

[36] Lammers J, Stapel DA. Power increases dehumanization. *Group Process Intergroup Relat* 2011;14:113-126.

[37] Lipworth W, Little M, Markham P, Gordon J, Kerridge I. Doctors on status and respect: A qualitative study. *J Bioeth Inq* 2013; 10:205-217.

[38] Lott B. The social psychology of class and classism. *Am Psychol* 2012;67:650-658.

[39] Lott B, Saxon S. The influence of ethnicity, social class, and context on judgments about U.S. women. *J Soc Psychol* 2002;142:481-99.

[40] Loughnan S, Haslam N, Sutton RM, Spencer B. Dehumanization and social class. *Soc Psychol* 2014;45:54-61.

[41] Marmot M. Status syndrome. *Significance* 2004;1:150-154.

[42] McKay KA, Narasimhan S. Bridging the gap between doctors and nurses. *J Nurs Edu Pract* 2012;2: 1-4.

[43] Meghani SH, Byun E, Gallagher RM. Time to take stock: a meta-analysis and systematic review of analgesic treatment disparities for pain in the United States. *Pain Med* 2012;13:150-74.

[44] Melotti RM, Samolsky Dekel BG, Carosi F, Ricchi E, Chiari P, D'Andrea R, Di Nino G. Categories of congruence between inpatient self-reported pain and nurses evaluation. *Eur J Pain* 2009;13:992-1000.

[45] Meucci RD, Fassa AG, Faria NM. Prevalence of chronic low back pain: systematic review. *Rev Saude Publica* 2015;49:73.

[46] Montoya AK. The Power of Design: Impact of Experimental Design Outweighs Impact of Inferential Methods on Statistical Power to Detect Indirect Effects. 2020. PsyArXiv. doi:10.31234/osf.io/gqryz

[47] Montoya AK, Hayes AF. Two-condition within-participant statistical mediation analysis: A path-analytic framework. *Psychol Methods* 2017;22:6-27.

[48] Pettit KE, Turner JS, Kindrat JK, Blythe GJ, Hasty GE, Perkins AJ, Ashburn-Nardo L, Milgrom LB, Hobgood CD, Cooper DD. Effect of socioeconomic status bias on medical student-patient interactions using an Emergency Medicine simulation. *AEM Educ Train* 2017;22:126-131.

[49] Samulowitz A, Gremyr I, Eriksson E, Hensing G. "Brave Men" and "Emotional Women": A Theory-Guided Literature Review on Gender Bias in Health Care and Gendered Norms towards Patients with Chronic Pain. *Pain Res Manag* 2018;25:e6358624.

[50] Schulz AJ, Mullings LE. *Gender, race, class, & health: Intersectional approaches*. San Francisco, CA: Jossey-Bass, 2006.

[51] Suhonen R, Gustafsson ML, Katajisto J, Välimäki M, Leino-Kilpi H. Individualized care scale - nurse version: a Finnish validation study. *J Eval Clin Pract* 2010;16:145-54.

[52] Tait RC, Chibnall JT. Racial/ethnic disparities in the assessment and treatment of pain: psychosocial perspectives. *Am Psychol* 2014;69:131-41.

[53] Trawalter S, Hoffman KM, Waytz A. Racial bias in perceptions of others' pain. *PLoS One* 2012;7:e48546.

[54] Volpato C, Andrighetto L, Baldissarri C. Perceptions of low-status workers and the maintenance of the social class status quo. *J Soc Issues* 2017;73:192-210.

[55] World Health Organization. *Cancer pain relief and palliative care. Report of a WHO Expert Committee*. World Health Organ Tech Rep Ser 1990;804:1-75.