Exploring pain prevalence, attitudes, and coping strategies: A technical report

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We have no known conflict of interest to disclose.

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Abstract

This pilot study aimed to assess the prevalence of pain and explore associated attitudes and coping mechanisms among adults aged 18 to 65. Using an anonymous Qualtrics survey, data were collected from 31 participants who reported their pain frequency, management strategies, and the degree to which pain interfered with their daily lives. Key definitions were established to categorize participants as experiencing no pain, persistent pain, or chronic pain. Results showed that 87% of respondents experienced pain in the last month, with 45.2% reporting chronic pain (pain more than once per week). Over-the-counter medications were the most common management strategy. Factor analysis revealed two main areas of pain interference: Internal Interference, impacting mental well-being, and External Interference, affecting social and occupational functioning. The study highlights the need for further research with larger, more diverse samples and validated measures to improve understanding of chronic pain and its impacts.

Keywords: pain prevalence, pain perception, chronic pain

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This pilot project consists of a survey that evaluated pain prevalence and attitudes in a small sample. Chronic pain constitutes a substantial health challenge. Approximately 100 million Americans experience chronic pain, generating an estimated $560-635 billion (about $1,700 per person in the US) in treatment costs and lost productivity each year (Board on Health Services Policy, 2011). Chronic pain, or the persistence of pain for more than three months exceeding an injury's recovery time, is associated with significant reductions in quality of life, including physical and social functioning, emotional wellbeing, and vitality (Husky et al., 2018). Chronic pain affects more than 1 in 5 adults and significantly contributes to disability, morbidity, and mortality globally (Young et al., 2006).

Chronic pain is frequently treated as a symptom to a diagnosis and not a diagnosis in and of itself (Board on Health Sciences Committee, 2011). In other words, doctors and patients primarily describe pain as injury or disease related, which makes the exact prevalence and incidence of chronic pain unknown (Board on Health Sciences Committee, 2011). Additionally, individuals who struggle with pain on a cyclical or irregular basis (headaches, menstrual cramps, IBS) might not classify their pain as chronic (Rustøen et al., 2005).

To contribute to and expand upon existing research on pain prevalence (chronic or not), the present study seeks to collect descriptive data on individuals who may or may not be experiencing pain. With the data collected, the study aims to (1) quantify the number of individuals with no pain, persistent pain, and chronic pain (2) identify pain attitudes and perceptions between groups.

Constructs

The construct analyzed in this survey is pain. Pain is defined as the awareness of an uncomfortable or noxious stimulus in or on an individual's body for at least one hour. The study defines individuals with no pain as individuals who experienced pain less than once per month, individuals with persistent pain as individuals who experienced pain at least once per week, and individuals with chronic pain as individuals who experienced pain more than once per week.

Pain: *the awareness of an uncomfortable stimulus in or on an individual's body for at least one hour*

No Pain: *2x per month*

Persistent Pain: *4x per month*

Chronic Pain: *>5x per month*

Methods

Target Population

The present study targets individuals between 18 and 65 years of age who do and do not experience pain regularly. To limit non-response bias of individuals who experience pain but might not classify their pain as regular, as well as to reduce skewed results from individuals currently seeking pain management, the study will not specifically advertise to individuals with pain related or pain causing diagnoses. Instead, the study seeks to collect data on the general population and then classify respondents based on their answers. Individuals under 18 and over 65 will be excluded from participating due to growth related pain in childhood and the increase in prevalence of age-related pain after 65 (Tutelman et al., 2021; Stompór et al., 2019).

Participants in Pilot Administration

Consent to participate in the survey was gained from the first question (see Appendix). Inclusion in the pilot administration was based on age (≥18, ≤65) and an affirmative response to the following question: *In the last month, have you experienced pain (an awareness of noxious stimuli in or on your body for at least one hour)?* Those who negated were directed to demographic questions and then survey termination. Of the 31 respondents, only 4 negated pain. Those who affirmed were directed to questions on pain frequency, average pain rating, and pain origin. Participants were then asked about pain medication management, including type and frequency. Finally, participants were asked about their pain interference and pain experience. All 31 respondents answered every applicable survey question.

Data Collection

Convenience sampling was utilized to recruit friends, family, and classmates of the researcher via individual text messages and Canvas (Taherdoost, 2016). Participants were

provided with the Qualtrics link to access the survey in their preferred web browser. Prior to beginning the survey, participants were informed of survey anonymity, study purpose, and provided researcher contact information. The survey was anonymous to limit response bias (Stockemer, 2019).

Convenience sampling was utilized due to its ease and accessibility. As a recruitment method, it is inexpensive, easily accomplished, and does not have the same time demand as other methods. The limitations of convenience sampling, such as selection bias, an unrepresentative sample, and lack of generalizability, will be addressed in the final report.

Survey Tool Design

Demographic Items

Previous literature attests to sociodemographic differences in pain prevalence and attitudes (Rustøen et al, 2005). To add to this literature, participants were asked to report their gender, race, and age.

Items on Pain

Pain *prevalence* was assessed via 3 questions assessing pain frequency, origin, and average rating. Pain *management* was assessed via pain medication type and frequency. Pain *interference* was measured via the PROMIS SF v11 Pain Interference 6b survey. Pain *experience* was measured via six 5-point Likert response scale questions assessing rumination, depression, and anxiety.

Measures

PROMIS SF v11 Pain Interference 6b survey. PROMIS Pain Interference 6b is a 6-item measure assessing the self-reported consequences of pain on relevant aspects of a person's life, such as the extent to which pain hinders engagement with social, cognitive, emotional, physical,

and recreational activities (Amtmann, 2010). The Pain Interference items utilize a 7–day recall period (items include the phrase "the past 7 days"). A sample item reads, ‘In the past 7 days, how much did pain interfere with your enjoyment of life?’ Participants respond to each item by selecting 1 [not at bit], 2 [A little bit], 3 [Somewhat], 4 [Quite a bit], or 5 [Very much]. Scores are summed, with higher scores indicating higher pain interference. The Cronbach’s alpha in the present sample was .93.

Pain Experience. Pain Experience is a 6-item measure designed to assess internalizing behaviors related to pain. A sample item reads, ‘When I experience pain, I can’t stop thinking about it.’ Participants respond to each item by selecting 1 [not at bit], 2 [A little bit], 3 [Somewhat], 4 [Quite a bit], or 5 [Very much]. Scores are summed, with higher scores indicating higher pain interference. The Cronbach’s alpha in the present sample was .84.

Data Management

Data were exported from Qualtrics to excel. All data unnecessary for analysis were removed. Categorical variables were recorded numerically and imputed into a codebook for reference. Cleaned data were then exported into SPSS for analysis. Four of the 31 total participants did not experience pain, and therefore did not provide pain related data.

Ethical Considerations

The survey at present follows APA ethical guidelines. First, the survey was anonymous and therefore no personal health information (PHI) could be linked to respondents or leaked. All data were managed and stored in Qualtrics, a secure data software platform. Only the researcher was able to access this data via a secure login. After collection, data were exported into SPSS, a statistical software. SPSS files were stored on the researcher’s password protected computer. All

participants were informed of the research aim, researcher contact, and voluntary nature of completing the survey before consenting to begin.

Results

Descriptives

Participants in this sample were 67.7% female, 29% male, and 3.2% non-binary or third gender (N = 31). The majority of participants were white (77.4%) and between the ages of 25 and 34 (51.6%). Out the 31 respondents, 27 (87.1%) experienced pain in the last month with 45.2% experiencing pain more than once a week. The average level of pain reported on a scale of 0 to 10 was 5 (M = 5, SD = 1.71). When asked about pain origin, 48.4% selected multiple origins including headache/migraine, joint pain, muscle pain, and/or spine/neck/back pain.

To manage pain, 25.8% took pain medication less than once, 19.4% once a week, 22.6% two to three times per week, and 6.5% four to six times per week. Over the counter pain medications were the most frequently reported pain medication used (51.6%). Additional demographic data can be seen in Table 1.

Item Analysis & Exploratory Factor Analysis

13 items assessing pain interference were included for item analysis. The initial Cronbach's alpha was .89, indicating the survey to be reliable. However, two items "When I experience pain, I wish it would go away" and "When I experience pain, I try to ignore it" were found to be poorly correlated with the survey construct and were removed. The reliability of the survey increased to .92.

Bartlett's test of sphericity and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was analyzed to assess the suitability of the items for factor analysis. The Kaiser-Meyer-Olkin (KMO) test was conducted on the 11 items to assess the adequacy of the sampling

for factor analysis. The Measure of Sampling Adequacy (MSA) was 0.81, indicating that the items were suitable for factor analysis. Bartlett's test was significant at $p < .001$ with a χ^2 (55) = 198.39, demonstrating suitability to conduct exploratory factor analysis.

Dimensionality was assessed using principal components analysis. Two overarching factors were identified and retained based on an eigenvalue of 6.23 and 1.58. Examination of the scree plot and factor loadings confirmed two factors. New variables were created for Internal Interference and External Interference.

Internal Interference

Internal Interference assesses the mental toll pain takes on the participant, including rumination, bother, depression, and anxiety. The items had a rating scale with 1- Never, 2-Sometimes, 3-About half the time, 4-Most of the time, and 5-Always. With a mean score across the 4 items of 2.84, participants were internally interfered by their pain only sometimes. Looking across items, participants felt bothered (3.44) and ruminated about their pain (2.96) about half the time. Participants experienced pain related anxiety (2.67) and depression (2.30) sometimes. The category of Never was not used for the following items: When I experience pain, I... - Can't stop thinking about it and When I experience pain, I... - Am bothered by it. Results can be seen in Table 2.

Reliability estimation and item analysis were conducted with the Internal Interference factor. Cronbach's alpha was high at 0.84 overall. Comrey and Lee's (1992) guidelines for factor loadings are used as cut off values for this study: 0.71 is excellent, 0.63 is very good, 0.55 is good, 0.45 is fair, and anything below 0.32 is poor. All items fit the Internal Interference factor with factor loadings between 0.70 and 0.84 (Comrey and Lee, 1992).

External Interference

External Interference assesses the social toll pain takes on the participant, such as work, schooling, and recreational activities. The items had a rating scale with 1- Never, 2-Sometimes, 3-About half the time, 4-Most of the time, and 5-Always. With a mean score across the 7 items of 2.61, participants were externally interfered by their pain only sometimes. Looking across items, pain interfered with participants' ability to exercise (3.04) and participate in recreational activities (2.81) about half the time. Participants reported that pain interfered with their ability to concentrate (2.67), enjoy life (2.52), complete day to day tasks (2.52), engage in social activities (2.37), and work (2.33) sometimes. All item categories were selected by participants at least once. Results can be seen in Table 3.

Reliability estimation and item analysis were conducted with the External Interference factor. Cronbach's alpha was high at 0.93 overall. Comrey and Lee's (1992) guidelines for factor loadings are used as cut off values for this study: 0.71 is excellent, 0.63 is very good, 0.55 is good, 0.45 is fair, and anything below 0.32 is poor. All items fit the Internal Interference factor with factor loadings between 0.73 and 0.89 (Comrey and Lee, 1992).

Future Research

Future research should investigate the validity and reliability of the survey. Due to time constraints, the study at present was unable to pilot measures before administration. Future research should first seek to establish content validity by administering the survey to expert pain-management researchers and then interviewing them to assess if the content of the survey is indeed measuring the intended construct (Creswell and Creswell, 2005). Future research should then seek to establish convergent validity by adding questions from the PROMIS Pain Interference - Short Form 6b V1.0. Since this inventory should be measuring the same construct as the survey matrix question 'When I experience pain, I…can't stop thinking about it/am

bothered by it/wish it would go away/feel depressed/ feel anxious/ try to ignore it or tough it out', a correlation of the average survey score and the average of the PROMIS items should be strongly correlated and therefore support this type of validity (Creswell and Creswell, 2005; Amtmann, et al., 2010). Finally, construct validity should be established through item response theory using Rasch analysis to examine ratios between categories, test scale use, and to explore category structure and function (Creswell and Creswell, 2005; Amtmann, et al., 2010).

Notably, future research should also expand sampling and recruitment techniques. The study at present utilized convenience sampling, which can lead to selection bias, an unrepresentative sample, and a lack of generalizability (Taherdoost, 2016).

Finally, to improve ethical standards, future research should omit groups with small sample size to reduce the risk of linkage (Lavery and Mendez, 2021). Future research should also seek IRB approval to allow for generalizability of results as well as pilot survey questions to ensure they are easily understandable and accessible to all.

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Table 1

Demographic Characteristics of Survey Responders n (%)

Experienced Pain	
Yes	27 (87.1)
No	4 (12.9)
Age	
18 - 24	5 (16.1)
25-34	16 (51.6)
34 - 44	8 (25.8)
55-65	2 (6.5)
Gender	
Female	21 (67.7)
Male	9 (29)
Non-binary or third gender	1 (3.2)
Race	
White	24 (77.4)
Asian	1 (3.2)
Black or African American	1 (3.2)
Hispanic or Latino	4 (12.9)
Middle Eastern or North African	1 (3.2)
Days with pain per month	
≤1	1 (3.2)
2	6 (19.4)
4	6 (19.4)
≥5	14 (45.2)
Pain Origin	
Multiple	15 (48.4)
Headache, Migraine	2 (6.5)
Joint Pain	3 (9.7)

Muscle Spasms	6 (19.4)
Spine, neck, or back	1 (3.2)
Other	0 (0)
Pain Medication Use Frequency	
None	4 (12.9)
< once per week	8 (25.8)
Once per week	6 (19.4)
2-3x per week	7 (22.6)
4-6x per week	2 (6.5)
Pain Medication Type	
None	3 (9.7)
Over the Counter (OTC)	16 (51.6)
Prescription and OTC	3 (9.7)
Holistic and OTC	4 (12.9)

Figure 1

Scree Plot

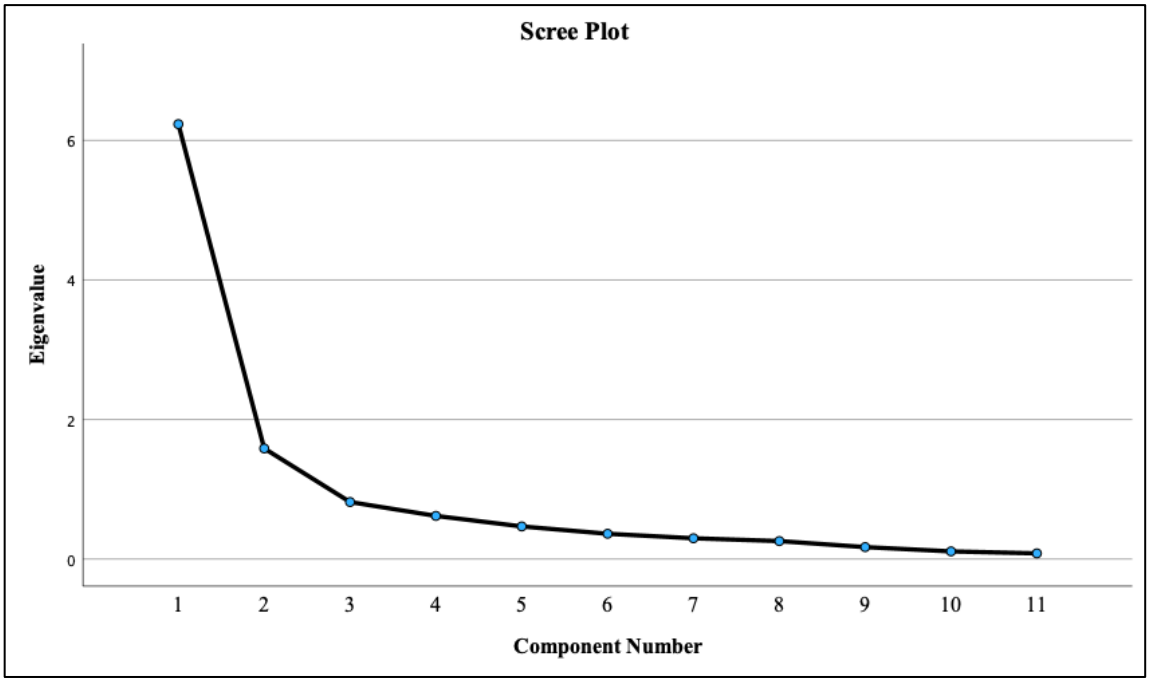


Table 2

Internal Interference Statistics

Item	Mean	Min-Max	N	Mode	Factor Loading
In the last month, pain interfered with my…Work or schooling	2.33	1-5	27	1	0.79
In the last month, pain interfered with my…Ability to concentrate	2.67	1-5	27	2	0.88
In the last month, pain interfered with my…Ability to exercise	3.04	1-5	27	2	0.85
In the last month, pain interfered with my…Day-to-day activities	2.52	1-5	27	2	0.87
In the last month, pain interfered with my…Social time	2.37	1-5	27	1	0.74
In the last month, pain interfered with my…Enjoyment of life	2.52	1-5	27	2	0.76
In the last month, pain interfered with my…Enjoyment of recreational activities	2.81	1-5	27	2	0.79

Table 3

External Interference Statistics

Item	Mean	Min-Max	N	Mode	Factor Loading
When I experience pain, I…Can't stop thinking about it	2.96	2-5	27	2	0.81
When I experience pain, I…Am bother by it	3.44	2-5	27	4	0.70
When I experience pain, I…Feel depressed	2.30	1-5	27	2	0.84
When I experience pain, I…Feel anxious	2.67	1-5	27	2	0.79

Appendix

University of Colorado **Denver**

This survey is being conducted as part of a research and evaluation master's course assignment on survey methods.

The questions contained in the survey are based on pain, pain management, and pain perception. This survey does not collect any identifying information and your responses are fully anonymous. Your participation is fully voluntary and greatly appreciated.

The survey consists of 7 multiple choice questions, 2 matrix questions, and 3 demographic questions. 2 matrix questions and 8 demographic questions and should take approximately 5 minutes to complete.

Please do not hesitate to reach out to the researcher, Emily Gyongyosi, at emily.gyongyosi@cuanschutz.edu should you have any questions. Do you wish to continue?

◯ Yes

◯ No

→


University of Colorado Denver
In the last month, have you experienced pain (an awareness of a noxious stimuli in or on your body for at least one hour)?
Yes
No
→

How frequently did you experience pain in the last month?

- ◯ Less than once a month (1 or fewer days with pain a month)
- ◯ Once every other week (2 days with pain a month)
- ◯ Once every week (4 days with pain a month)
- ◯ More than once a week (5+ days with pain a month)

When you experience pain, how would you rate your pain level on average?

(0) No Pain 10 (Worst pain imaginable)

0 1 2 3 4 5 6 7 8 9 10

Average Pain

→

Where is the origin of your pain?

- ◯ Spine, Neck, or Back Pain
- ◯ Muscle spasms or sprains
- ◯ Joint Pain (Fingers, Toes, Knees, Wrists)
- ◯ Nerve Pain
- ◯ Headache, Migraine
- ◯ Autoimmune-Related Pain
- ◯ Osteoarthritis
- ◯ Fibromyalgia
- ◯ 2 or more of the above
- ◯ Unknown cause or source of pain

→

Have you taken prescription or non-prescription medication(s) for pain in the last month?

- ◯ Yes
- ◯ No

→

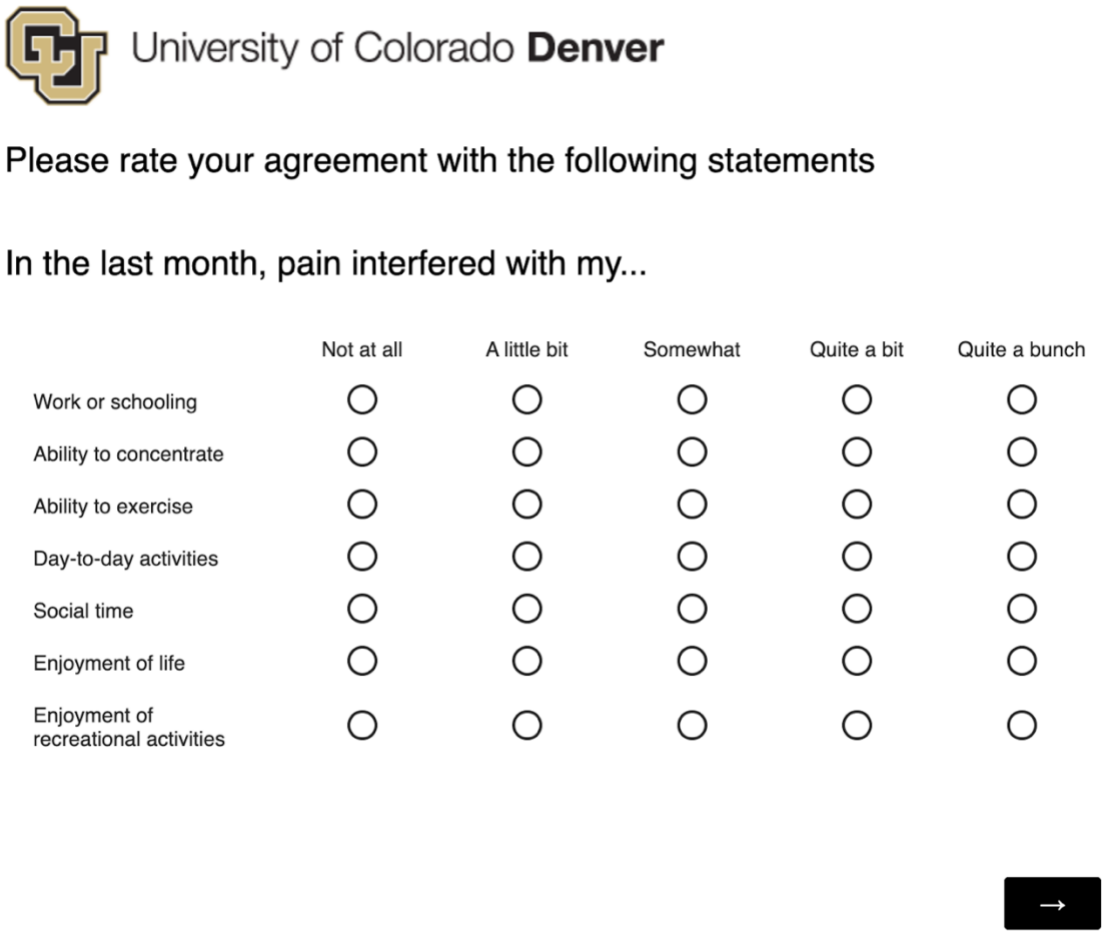
How often do you take medications for pain?

- ○ Daily
- ○ 4-6 times a week
- ○ 2-3 times a week
- ○ Once a week
- ○ Less than once a week

What type of pain medication have you taken in the last month?

- ☐ Opioids
- ☐ Prescription
- ☐ Over the counter
- ☐ Holistic (Cannabis, supplements, teas)

→



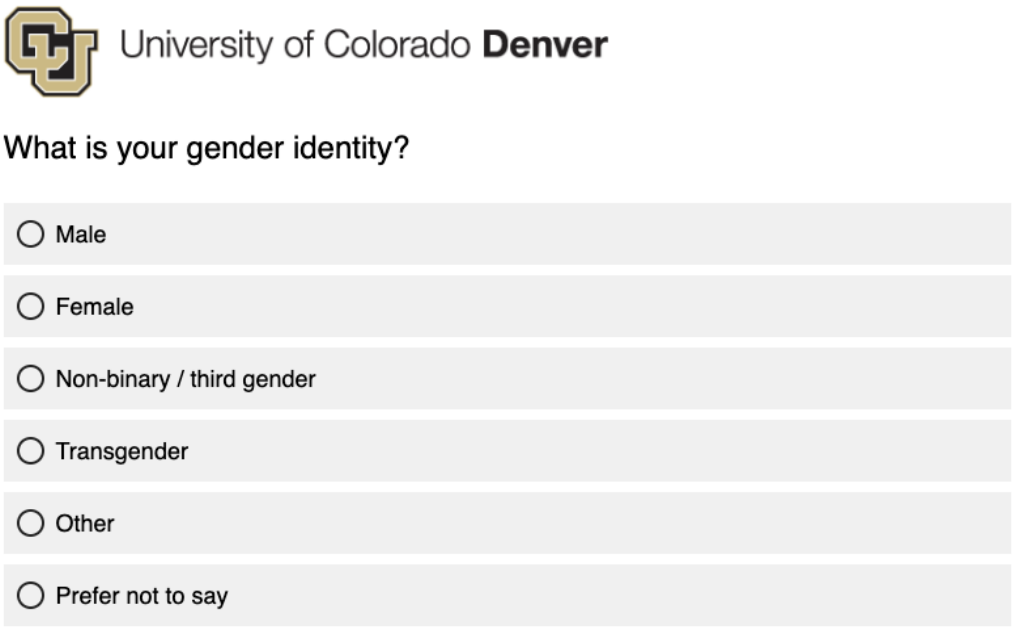
University of Colorado **Denver**

Please rate your agreement with the following statements

In the last month, pain interfered with my...

	Not at all	A little bit	Somewhat	Quite a bit	Quite a bunch
Work or schooling	○	○	○	○	○
Ability to concentrate	○	○	○	○	○
Ability to exercise	○	○	○	○	○
Day-to-day activities	○	○	○	○	○
Social time	○	○	○	○	○
Enjoyment of life	○	○	○	○	○
Enjoyment of recreational activities	○	○	○	○	○

→



University of Colorado **Denver**

What is your gender identity?

- ○ Male
- ○ Female
- ○ Non-binary / third gender
- ○ Transgender
- ○ Other
- ○ Prefer not to say

What is your race?

- [ ] American Indian or Alaska Native
- [ ] Asian
- [ ] Black or African American
- [ ] Hispanic or Latino
- [ ] Middle Eastern or North African
- [ ] Native Hawaiian or Pacific Islander
- [ ] White
- [ ] Mixed Race

How old are you?

- ○ 18-24
- ○ 25 - 34
- ○ 35 - 44
- ○ 45 - 54
- ○ 55 - 64
- ○ 65+

→

Please rate your agreement with the following statements

When I experience pain, I...

	Always	Most of the time	About half the time	Sometimes	Never
Can't stop thinking about it	○	○	○	○	○
Am bothered by it	○	○	○	○	○
Wish it would go away	○	○	○	○	○
Feel depressed	○	○	○	○	○
Feel anxious	○	○	○	○	○
Try to ignore it or tough it out	○	○	○	○	○

→

We thank you for your time spent taking this survey.
Your response has been recorded.