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Abstract

Background: Chronic pain and higher body weight frequently co-occur. This common comorbidity is thought to be mediated by the use of comfort eating as a strategy for managing both the physical and psychological pain and discomfort associated with flare ups of chronic pain. Valid and reliable assessment tools are needed to inform the development of effective treatments. **Aims:** This study aimed to assess the psychometric properties of a new brief measure of pain-induced comfort eating in chronic pain, the Pain-induced Comfort Eating Scale (PICES). **Methods:** A sample of 166 chronic pain patients completed an online test battery including the PICES along with measures of chronic pain and pain-related symptoms, disordered eating, and related psychological factors. **Results:** Results of exploratory factor analysis revealed a single factor model for the four-item PICES. Further, the PICES demonstrated evidence of good internal consistency as well as convergent validity with demonstrated correlations with related measures. The results of this study also revealed that comfort eating in chronic pain appears to be related to psychological distress; the PICES correlated more strongly with measures assessing mood and psychological distress compared to interference/intensity of physical pain itself. Scores on the PICES also correlated strongly with measures of uncontrolled and emotional eating. **Conclusions:** Overall, our results indicate that the PICES provides a valid and useful brief measure of comfort eating in chronic pain that might be useful to inform treatments targeting the comorbid disordered eating practices which can lead to higher body weights in chronic pain patients.

1. INTRODUCTION

Chronic pain affects approximately 20% of the adult population worldwide[1,2] and is the most common reason that people seek medical care[3]. Obesity is operationalised as a Body Mass Index (BMI) of 30 or above and is also highly prevalent, with over 40% of adults in the US now classified as obese[4]. It is not surprising then that chronic pain and obesity have been described as "two colliding epidemics"[5], with up to 40% of individuals with obesity also living with chronic pain[6]. Chronic pain and obesity have a synergistic relationship, such that those with a BMI of 40+ are 256% more likely to report chronic pain than those of normal weight [7], and each compound the negative health outcomes of the other[8].

Pain is an unpleasant experience by definition[9], and individuals experiencing pain seek a variety of ways to avoid or reduce its aversiveness. Taking medication, resting, applying heat packs and having massages are common pain-relieving practices, however there is increasing recognition that food consumption can serve a similar purpose.

Comfort eating, the term used to describe the consumption of food in response to the experience of negative (or positive) affect, is conceptualised as an avoidant behavioural response to psychological discomfort[10]. Individuals who use food to "self-soothe" typically consume foods high in sugar or salt, due to their naturally rewarding properties[11], and comfort eating is known to be a major contributor to overeating behaviour and obesity[12,13]. According to Gibson[12], comfort eating behaviour and food choices are strikingly similar in both human and animal studies, with exposure to stress resulting in preferential selection of an energy-dense diet, and longer term associations with weight gain and obesity.

Individuals living with chronic pain may also use food as a means of coping with their physical discomfort and associated psychological distress. A recent study of 151 heterogeneous chronic pain patients found that 77.5% reported using food to help cope with pain flare-ups, and 34.8% reported comfort eating for pain relief at least once a week[14].

Foods high in sugar and fat were the most common comfort eating food types reported by participants[14]. The vicious cycle represented here is that while comfort eating may provide temporary pain relief, it can also lead to weight gain – which can in turn exacerbate chronic pain via the increased mechanical load on joints and/or systemic inflammation due to excessive adipose tissue[15,16]. In order to be able to further examine the role and relationship between comfort eating and chronic pain, a psychometrically sound measure of the frequency and severity of comfort eating as a coping strategy for chronic pain is needed.

The development of such a measure, the Pain-induced Comfort Eating Scale (PICES), was described by O'Loughlin and Newton-John[14]. The Pain-induced Comfort Eating Scale (PICES) is a brief, self-report measure of food consumption in response to chronic pain flare-ups. The current study aims to investigate the factor structure and the psychometric validity and reliability of the PICES. Specifically, the convergent validity of the PICES was assessed in relation to established measures of pain (pain intensity and pain-related interference, pain catastrophising), as well as the related constructs of disordered eating, experiential avoidance, and psychological distress.

2. MATERIALS & METHODS

This study forms part of a larger project investigating comfort eating in chronic pain, and the data used in the current study were drawn from an existing dataset, therefore the design of the test battery and the collection of the data used in the current study has been previously described in O'Loughlin & Newton-John[14].

2.1 Participants

Participants ($N = 166$) were recruited using online advertisements posted to relevant Australian chronic pain organisation websites and social media platforms. A series of

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questions regarding age, chronic pain status, eating disorder history and weight-loss surgery history were used to screen out ineligible participants who did not proceed to complete the full test battery (i.e., eligible participants were individuals aged over 18 who reported having been diagnosed with chronic pain (defined as "pain on a more or less daily basis for at least 3 months") by a healthcare professional, who had not undergone weight-loss surgery and who reported that they had never experienced an eating disorder). Individuals with a self-reported history of an eating disorder were excluded as the focus of this preliminary work is on individuals using food as coping strategy for chronic pain, rather than behaviours that might be symptomatic of a clinical eating disorder. Further demographic questions then assessed the participants' gender, ethnicity, employment status, education history, weight, height and details about their experience of chronic pain.

2.2 Measures

The test battery consisted of a range of self-report measures which assess chronic pain variables, psychological distress, disordered eating and related constructs, and has been previously described in O'Loughlin and Newton-John[14].

2.2.1 Pain-induced comfort eating

The original scale development of the Pain-induced Comfort Eating Scale (PICES) involved the modification of two items from the 'Midlife in the United States' series[17] that were used to assess the extent to which respondents engaged in certain activities in response to stress (item 1 "I eat more of my favourite foods to make myself feel better" and item 2 "I eat more than I usually do"). These two items have been used to measure stress-induced eating[18,19]; O'Loughlin & Newton-John[14] modified the wording in the instructions to reflect that the respondent has engaged in these behaviours in response to 'flare-ups' of chronic pain

(transient but often severe exacerbations in usual pain levels). Participants rate their response on a four-point Likert-type scale (where 1 refers to 'A lot' and 4 refers to 'Not at all', reverse scored), with higher scores reflecting greater pain-induced comfort eating. O'Loughlin & Newton-John[14] also asked participants two additional questions to assess the frequency of pain-induced comfort eating (from '1' for Never to '8' for 'Multiple times a day'), as well as what types of food participants consume when engaging in pain-induced comfort eating (e.g., foods high in sugar, fat, carbohydrates, salt etc; this item is unscored). These four items make up the PICES (the final version of which is included as an Appendix at the end of this paper). A total score is arrived at by summing the value of questions 1 to 3, with a minimum of 3 and maximum of 16. The total score gives an indication of the severity and frequency of pain-induced comfort eating.

2.2.2 Pain intensity and interference

The Brief Pain Inventory (BPI)[20] is an 11-item questionnaire which assesses chronic pain intensity and level of interference caused by chronic pain. The pain intensity subscale consists of four items; participants rate their response to items on an 11-point Likert-type scale from 0 (No pain) to 10 (Pain as bad as you can imagine). The pain interference subscale consists of seven items; participants rate their response to items on an 11-point Likert-type scale from 0 (Does not interfere) to 10 (Completely interferes). The BPI has demonstrated good internal consistency reliability and construct validity in a chronic pain sample[21]. In the current study, the BPI intensity scale demonstrated good internal consistency, $\alpha = .85$, and the BPI interference scale demonstrated excellent internal consistency, $\alpha = .90$.

2.2.3 Pain catastrophizing

The Pain Catastrophizing Scale (PCS)[22] is a 13-item questionnaire which assesses three domains of pain catastrophising; magnification, helplessness and rumination[22]. Items are rated on a 5-point scale from 0 (Not at all) to 4 (All the time). The PCS has demonstrated good internal consistency reliability and construct validity in a chronic pain sample[22]. In the current study, the PCS demonstrated excellent internal consistency, α = .94, with good to excellent internal consistency for the subscales (Magnification, α = .74; Helplessness, α = .89; Rumination, α = .91).

2.2.4 Psychological Distress Symptoms

The assessment of psychological distress symptoms including symptoms of depression, anxiety and stress were done using the Depression, Anxiety, and Stress Scale (DASS-21)[23]. The DASS-21 is a valid and reliable measure of the severity of symptoms of depression, anxiety, and stress[24]. Participants are asked to endorse each item on a 4-point Likert-type scale (0 'Did not apply to me at all' to 3 'Applied to me very much, or most of the time'). When the subscales are combined, the DASS-21 total score provides a measure of general psychological distress[24-25]. The DASS-21 total score demonstrated excellent internal consistency, α = .93, with good to excellent internal consistency for the subscales (Depression, α = .90; Anxiety, α = .82; Stress, α = .85) in the present study.

2.2.5 Experiential avoidance

The Brief Experiential Avoidance Questionnaire (BEAQ)[26] is a 15-item measure assessing six domains of experiential avoidance (distress aversion, procrastination, repression/denial, behavioural avoidance, suppression, and distress endurance). Respondents rate their agreement with statements on a 6-point scale from 1 (strongly disagree) to 6 (strongly agree). The scale has demonstrated good internal consistency reliability and

convergent validity[26]. The BEAQ demonstrated good internal consistency, α = .83, in the present study.

2.2.6 Disordered eating

The Three Factor Eating Questionnaire – Revised 21 item version (TFEQ-R21)[27] was used to measure three aspects of disordered eating: cognitive restraint (the tendency to consciously control eating behaviour in order to prevent weight gain), uncontrolled eating (the rapid consumption of excessive quantities of food) and emotional eating (the tendency to eat in response to positive or negative emotions). Items are rated on a 4-point Likert scale from 1 (Definitely true) to 4 (Definitely false). The cognitive restraint subscale is associated with restricted eating practices, whereas the uncontrolled and emotional eating subscales are associated with binge eating and/or overeating[27]. The TFEQ-R21 has demonstrated adequate reliability and validity and exhibited good to excellent internal consistency (Cognitive restraint, α =.76; Uncontrolled eating, α =.87; Emotional Eating, α =.91) in the current study.

2.3 Procedure

This study forms part of a larger project investigating comfort eating in chronic pain. The research project was approved by the University of Technology Sydney Human Research Ethics Review Committee (UTS HREC Ref. No.: 2015000482-66). The data used in the current study were drawn from an existing dataset, the collection of which has been previously described in O'Loughlin & Newton-John[14]. Interested participants followed a link from an online advertisement and were provided a participant information statement and consent form. Consenting participants were then directed to complete a series of questions online using Qualtrics Software. Initial screening questions exited ineligible participants from the survey. Eligible participants were presented with the study information statement, and participants who provided consent to participate were then invited to progress and complete

the full battery of questionnaires online. All questions and items in the test battery required a response prior to proceeding, therefore there were no missing data in the final dataset. A debriefing statement was provided to participants at the end of the study.

2.4 Data analysis

The sample size rationale, including details of the a priori power analysis, and details of the approach to data screening and assumption testing applied in determining the dataset utilised in the current study is presented in O'Loughlin and Newton-John [14]. The size of the sample was considered suitable for the aims of the present study as a minimum sample size of 10-20 participants per item is recommended for factor analysis, with larger sample sizes (e.g., N = 100-1000) often recommended as a minimum sample size for such analyses[28].The internal consistency of the PICES was tested with Cronbach's alpha and convergent validity for the PICES was assessed with Pearson and Spearman's rho correlations. Item-total correlation was estimated with Kendall's Tau. An Exploratory Factor Analysis (EFA) was performed to examine the factor structure of the PICES, the model was built polychoric correlation between items and using an unrotated minimum residual method. Analyses were conducted using SPSS (v26) and R (version 4.3.1).

3. RESULTS

The total sample consisted of 166 adult participants (M_{age} = 39 years old, SD = 13.48 years, $range$ = 18-78) who reported having been diagnosed with chronic pain by a healthcare professional, had never experienced an eating disorder, and had not undergone weight-loss surgery. Of the total sample, 95.18% identified as female (3.6% as male and 1.2% as other), 80.1% were Caucasian, 57.2% had completed tertiary-level qualification of a bachelor's degree of higher, and 25.9% were unemployed due to pain (with 21.7% engaged in full-time

work and 19.3% engaged in part-time work). The sample reported a mean Body Mass Index (BMI) of 29.80 (SD = 9.5, $range$ = 15.94-62.44), with 42.8% reporting a BMI in the obese range, 18.7% in the overweight range, 34.9% in the normal range and 3.6% in the underweight range. All participants reported having a diagnosis of chronic pain given to them by a health professional; of the total sample 32% reported their main pain site as being their lower back, 20% for lower limbs or foot, 15% for upper back or neck, 14% for abdomen or pelvis, 10% for upper limbs or hands and 8.5% for head or face as the main pain site. The average number of pain sites was 4.4 (SD = 1.78, $range$ = 1-6) and the average duration of chronic pain was 9.17 years (SD = 7.6 years, $range$ = 1-40 years).

3.1 Psychometric Properties

Scores on the PICES for the total sample ranged from the minimum score of 3 to the maximum score of 16; 12.65% of participants scored the lowest possible score of 3 (indicating no pain-induced comfort eating behaviour), and 1.81% of participants rated the highest score of 16 (indicating very frequent, high-volume pain-induced comfort eating behaviour relative to usual intake). Means and standard deviations for the individual items and total score of the PICES are provided in Table 1. All items on the PICES were found to be significantly inter-correlated, $r_{polychoric}$(164) =.60 to .79, and the item-total correlations were all significantly positively correlated (and higher than the conventional minimum value of .20; Kline, 1998), ranging from τ (164) =.91 to .97.

3.1.1 Internal Consistency

Cronbach's alpha was calculated for the PICES using the whole sample (N = 166) and good internal consistency was indicated, α = .80.

3.1.2 Convergent Validity

The convergent validity of the PICES was assessed by examining the correlations (Spearman's rho) between the PICES and measures assessing similar and related constructs, including the subscales of the BPI, PCS, BEAQ, DASS-21 and TFEQ, the results of which analyses are reported in Table 2. Overall, significant correlations ($p < .05$) were observed between the PICES and various subscales related to measures of chronic pain (see Table 2). Interestingly, the PICES was not found to correlate significantly with average pain intensity (BPI Intensity subscale) or with pain catastrophising (PCS). Positive correlations between the PICES and measures of stress (DASS-21 Stress subscale, $r(164) = .31$) and general psychological distress (the DASS-21 Total score, $r(164) = .26$,) were observed (Table 2). Correlations between the PICES and specific subscales of a measure of disordered eating (the TFEQ) which relates to uncontrolled and emotional eating were significantly correlated, falling in the moderate to strong range, $r(164) = .62$ and $r(164) = .77$), and the PICES was observed to have a significant positive correlation with BMI, $r(164) = .25$ (see Table 2).

3.2 Exploratory Factor Analysis

Parallel analysis and an examination of the scree plot indicated a one-factor solution (only one factor had an Eigenvalue > 1.0), so a single-factor EFA was undertaken using an unrotated minimum residual factoring method. The single-factor solution explained 69.0% of the variance, with strong factor loadings and communality demonstrated for each of the three scored items, see Table 3.

3.3 Scale refinement

In order to make the measure as user friendly as possible, the final scale included in the Appendix presents the Likert-scale numbers as they are to be scored rather than requiring

the middle two items to be reverse scored. Items were ordered to improve logical flow for the respondent (i.e., being asked first about frequency of their engagement in this behaviour prior to being asked about specifics and completing the Likert-type questions ahead of the open response item). The final version of the PICES, with scoring and interpretation information, can be found in the Appendix.

4. DISCUSSION

Chronic pain and obesity are highly prevalent and synergistic conditions, in which efforts to ameliorate the symptoms of pain by eating high calorie sugary foods can exacerbate the problems of obesity, and thus worsen the burden of chronic pain. This study presents psychometric data on a brief, self-report measure of comfort eating frequency and severity in the context of coping with chronic pain.

This initial evaluation of the PICES showed it to be a promising instrument. The internal consistency value was high, which is important but also impressive considering the relative brevity of the scale. There were no floor or ceiling effects found, with less than 15% of respondents obtaining the lowest or highest score on the scale. The assessment of convergent validity revealed the scores on the PICES were broadly in line with clinical and theoretical expectations. The PICES total score was significantly positively correlated with pain-related interference, and with BMI, which supports the "vicious cycle" conceptualisation of chronic pain and obesity[8]. These data show that more comfort eating behaviour is associated with greater body weight, which in turn is associated with greater difficulty carrying out daily activities due to pain. Of note was the fact that contrary to expectations, average pain intensity ratings were not associated with comfort eating behaviour. This suggests that it is not just those individuals who experience the most pain

who use food to cope, but that this problematic strategy can be used by anyone living with chronic pain.

The modest but significant positive relationships between all forms of psychological distress (depression, anxiety, stress) and the PICES further supports the construct validity of the instrument. These results are consistent with the clinical pattern identified in the qualitative study by Janke and Kozacs[29], in which participants reported that their comfort eating behaviour initially provided a sense of relief, as there was a temporary reduction in pain levels. However, the relief inevitably gave way to feelings of guilt, shame and frustration, as participants regretted consuming the unhealthy foods. These data suggest that the negative emotional and physical consequences of comfort eating behaviours persist for much longer than the transient relief they provide, thereby paralleling the effects of pain medications when taken long term for chronic pain[30].

This finding may also reflect the possibility that participants use comfort eating as a way of managing their general emotional discomfort, in addition to their chronic pain flare-ups. The finding that the PICES was not associated with average pain intensity but was significantly positively correlated with the experiential avoidance measure, would support this contention. The tendency to avoid aversive emotional experiences is known to be associated with greater psychological distress[31-32], and the fear avoidance model of pain has also established the maladaptive relationship between pain avoidance and poorer adjustment to pain[33-34]. These data extend the experiential avoidance literature by including the use of food, alongside more traditional methods such as excessive analgesic medication use and activity avoidance, as unhelpful methods of coping with chronic pain.

Finally, the strong associations between all individual items and the total score of the PICES with two of the three disordered eating measure subscales is further confirmation of the convergent validity of the scale. Individuals with a history of eating disorder, or who had

undergone weight-loss surgery, were screened out of the original study[14]. The lack of association between the Cognitive Restraint subscale of the TFEQ and the PICES, but a positive relationship between the Uncontrolled Eating and Emotional Eating subscales, is consistent with the PICES measuring behaviour related to aversive experiences – physical and emotional – rather than efforts to lose weight per se.

The finding that pain catastrophizing was not related to PICES total score was unexpected. Our hypothesis that comfort eating in response to pain flare-ups represents a maladaptive coping strategy led us to predict a significant relationship between the PCS and the PICES, as numerous studies have shown the link between pain catastrophizing and poor management of pain[35]. However, previous research has also shown that other factors can buffer the negative influence of pain catastrophizing, such as satisfaction with spouse responses protecting against the adverse impact of pain catastrophizing on psychological wellbeing[36], and trait optimism protecting against the deleterious effect of pain catastrophizing on pain intensity levels[37]. There may have been some unidentified factor in this study which also operated to buffer catastrophic thinking about pain against comfort eating, and social support and/or dispositional optimism would be logical variables to explore in future research.

This study has a number of strengths. The participant sample is large and comprises a specific clinical group (individuals with chronic pain who self-report to have not been diagnosed with an eating disorder), the psychometric evaluation analysed validity using a range of pain-related and general health measures, and a high proportion of scale variance was achieved with strong factor loadings on all three items. However, testing of the stability of the PICES is required in order to determine the extent to which responses vary over time, and a confirmatory factor analysis would provide further evidence as to the goodness-of-fit of the scale. The sensitivity of the measure to clinical intervention, such as following a

multidisciplinary pain management intervention where adaptive coping skills are taught[38], is also an important consideration for future evaluation. Finally, because this study was cross-sectional in design, it is not possible to test directionality of the 'vicious circle' hypothesis of increased pain-comfort eating-weight gain-increased pain referred to earlier. It could be that pain-related disability and difficulty moving and exercising is the driver of increased BMI, and comfort eating occurs in order to manage the negative feelings associated with being overweight rather than because of increased pain.

There are several limitations of this study which must be noted. First, a major limitation is the generalisability of these results due to the sample characteristics. The vast majority of the sample were female, tertiary educated and Caucasian. It would be important for future research to verify the findings of this study using a more diverse and representative sample. In addition, the findings of this study are limited by the use of an online sample who have self-reported their chronic pain diagnosis and symptom severity rather than the sample being drawn from a clinical service such as a chronic pain treatment clinic where the diagnosis of chronic pain could be verified by a trained medical or health professional. The reliance on self-reported clinical details is a major limitation for the present study and future studies investigating this measure should evaluate the properties of the measure in a clinical setting where clinical presentation can be thoroughly assessed and verified by a healthcare professional. This would also assist with verifying any medical and clinical conditions with more sophisticated methods for assessment and diagnosis rather than relying upon the self-reported measure of disordered eating status and BMI; this is especially important in light of the known limitations of the BMI as an assessment of obesity[8]. Finally, the sample used in this study excluded individuals who self-reported a history of an eating disorder which has limited the findings of this study, future studies should endeavour to assess the merits of this measure within a fully representative chronic pain sample which would include individuals

who experience co-morbid disordered eating. Within such a sample, future studies could assess whether the PICES can be used as a method for screening for disordered eating symptomatology within chronic pain samples. Additional pursuits for future research could also conduct a more thorough assessment of the scale's psychometric properties including assessing divergent validity, test-retest reliability and examining the scale's ability to distinguish between clinical groups. Furthermore, in order to provide solid evidence that excessive comfort eating in response to pain has a causal relationship with greater pain-related disability, a large longitudinal study which tracks the development of these putative associations over time is needed. A recent preliminary study by Lin and colleagues[39] explored changes in eating behaviour over time between individuals with subacute back pain who had recovered at 12 months, those whose back pain persisted, and a chronic back pain group. Their results suggested that disordered eating behaviour among those experiencing back pain is not immediate, but occurs dynamically, and predominantly among the chronic (mean of 5.4 years) back pain group.

Conclusion:

In this paper, we present a brief, valid and useful measure for the assessment of pain-induced comfort eating for sufferers of chronic pain, the PICES. In our study, the PICES demonstrated evidence of reliability and validity as a measure for use within a chronic pain sample. Given the recent systematic review and meta-analysis showing dietary interventions benefit chronic pain[40] and evidence that weight loss of even 5% is associated with reduced pain[41], a rapid, easily administered measure of disordered eating in the context of managing chronic pain is of significant clinical value. The PICES provides a helpful insight into the nature and severity of pain-induced comfort eating experienced by individuals with chronic pain. A better understanding of these eating behaviours and the mechanisms which drive

them will be helpful for informing future targeted and effective clinical interventions for these comorbid and synergistic chronic health conditions.

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Declaration of Interests Statement

The authors have no conflicts of interest to declare. The authors declare that no funding was received for this work.

Author Contributions

AB and TNJ conceived the design of the study described in this manuscript. IO and TNJ designed the original project that this study is a part of. IO collected the data and prepared the datafile. AB and KR conducted the data analysis. AB and TNJ drafted the manuscript. All authors read and reviewed the final manuscript.

Data Availability

Data is available upon request to the corresponding author.

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APPENDIX:
PAIN-INDUCED COMFORT EATING SCALE (PICES)

Please read the following questions and select the response that best fits with your experience <u>over the last three months.</u> Please note that the term 'flare-up' refers to an exacerbation in your usual pain levels.

Q1. How often do you use food as a way of coping with flare-ups of your chronic pain?
1. Never
2. Less than once per month
3. Once a month
4. Once a fortnight
5. Once a week
6. Several times a week
7. Once a day
8. Multiple times a day

The following two questions relate to using food as a way of coping with flare-ups of your chronic pain. Please rate the extent to which you engage with the following behaviours:

Q2. When experiencing pain flare ups, I eat more of my favourite foods to make myself feel better
1. Not at all
2. Only a little
3. A medium amount
4. A lot

Q3. When experiencing pain flare ups, I eat more than I usually do
1. Not at all
2. Only a little
3. A medium amount
4. A lot

Q4. What types of food do you usually eat to help cope with a pain flare-up?
List/Describe all that apply:

………………………………………………………………………………………………

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FOR ADMINISTRATION PURPOSES ONLY:
Scoring: Sum the scores from Q1-3 to obtain the PICES total score, Q4. is unscored and is included for the information of the administrator to better understand the specific nature of the comfort eating the respondent has been engaging in. For an adjusted total score, divide the score for Q1 by two prior to summing. *Interpretation:* The higher the PICES total score, the more severely the respondent experiences pain-induced comfort eating. Scores range from 3 (nil pain-induced comfort eating) to 16 (very frequent pain-induced comfort eating).

TABLES

Table 1. Mean and Standard Deviation (SD) scores of the PICES (N = 166)

Items of the PICES	Mean	SD	Range (Min – Max)
1. How often do you use food as a way of coping with flare-ups of your chronic pain?	3.44	1.96	1 - 8
2. When experiencing pain flare ups, I eat more of my favourite foods to make myself feel better	2.52	0.98	1 - 4
3. When experiencing pain flare ups, I eat more than I usually do	2.07	1.07	1 - 4
PICES Total Score	**8.02**	**3.57**	**3 - 16**

Table 2. Correlations (Spearman's *rho, df* =164) between the PICES (*N* = 166) and other scales/measures

Measures	Q1 PICES Frequency	Q2 Eat favourite foods	Q3 Eat more than usual	PICES Total Score
BPI: Chronic Pain Intensity	.09	.02	.09	.08
BPI: Chronic Pain Interference	**.19***	.11	.10	**.17***
PCS: Pain Magnification	.08	**.16***	.09	.11
PCS: Pain Helplessness	.10	.10	.06	.10
PCS: Pain Rumination	**.17***	.14	.09	**.16***
PCS: Pain Catastrophising Total	.14	.14	.09	.14
BEAQ: Experiential Avoidance	.13	.11	**.19***	**.16***
DASS-21: Depression	**.20***	.10	.11	**.16***
DASS-21: Anxiety	**.17***	**.17***	.12	**.18***
DASS-21: Stress	**.29****	**.29****	**.26****	**.31****
DASS-21 Total	**.26****	**.22****	**.19***	**.26****
TFEQ: Cognitive Restraint	.08	-.01	.15	.09
TFEQ: Uncontrolled Eating	**.55****	**.51****	**.60****	**.62****
TFEQ: Emotional Eating	**.67****	**.70****	**.72****	**.77****
Body Mass Index (BMI)	**.18***	**.19***	**.31****	**.25****

* = significant at 0.05 level, ** = significant at 0.01 level

Table 3. Results of an Exploratory Factor Analysis of the PICES ($N = 166$) Factor Loading and Communality

Items of the PICES	Factor Loading	Communality (h2)
Q1. How often do you use food as a way of coping with flare-ups of your chronic pain?	.69	.47
Q2. When experiencing pain flare ups, I eat more of my favourite foods to make myself feel better	.87	.75
Q3. When experiencing pain flare ups, I eat more than I usually do	.92	.83