▪ Headache Medicine 2021, 12(4):309-316 ▪ p-ISSN 2178-7468, e-ISSN 2763-6178

Headache Medicine

▪ DOI: 10.48208/HeadacheMed.2021.51

Original

Headache-related cognitive distortions questionnaire

Rebeca Veras De Andrade Vieira[1,2], B. Lee Peterlin[3], Fernando Kowacs[4,5], Renata Gomes Londero[4,6], Liselotte Menke Barea[5,7], Vanise Grassi[7], William Barbosa Gomes[2], Gustavo Gauer[2]

[1]Universidade do Vale do Rio dos Sinos, São Leopoldo, Rio Grande do Sul, Brazil.
[2]Universidade Federal do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil.
[3]Pennsylvania Headache Center, Camp Hill, Pennsylvania, USA
[4]Hospital Moinhos de Vento, Porto Alegre, Rio Grande do Sul, Brazil.
[5]Universidade Federal de Ciências da Saúde de Porto Alegre, Porto Alegre, Rio Grande do Sul, Brazil.
[6]Hospital de Clínicas de Porto Alegre, Serviço de Neurologia, Porto Alegre, Rio Grande do Sul, Brazil.
[7]Santa Casa de Misericórdia de Porto Alegre, Porto Alegre, Rio Grande do Sul, Brazil.

✉ Rebeca Veras de Andrade Vieira
rebecavieirapsico@gmail.com

Edited by:
Marcelo Moraes Valença

Abstract

Background

Cognitive distortions are systematic errors in thinking and can be observed in the relationship of headache patients with their own disease and treatment.

Objective

To construct and validate an instrument to evaluate headache-related cognitive distortions in those with primary headache disorders; and to investigate the psychometric properties of this new instrument.

Methods

One hundred thirty-six (136) migraine outpatients from three Brazilian specialized headache hospital services completed the Headache-related Cognitive Distortions Inventory (HCDQ) and validated measures of psychological symptoms, pain catastrophizing, mood disorders, quality of life and headache-related disability.

Results

All hypothesized study measures' correlations were statistically significant, supporting construct validity. HCDQ scores were positively correlated with headache frequency, headache intensity, psychological symptoms, depression, anxiety, and pain catastrophizing; and negatively correlated with 7 of 8 quality of life domains and time the patient was in treatment. Cronbach's alpha demonstrated excellent internal consistency for the 17-item total scale (alpha=.92). Along with headache intensity and depression, HCDQ Pain subscale accounted for 46% of variance in the prediction of headache-related disability.

Conclusions

HCDQ is a valid and reliable measure of migraine patients´ cognitive distortions about their headaches and headache treatment.

Keywords:
Cognitive distortions
Depression
Anxiety
Pain catastrophizing
Migraine

Received: January, 29 2022
Accepted: February, 16 2022

Introduction

There are some robust evidence showing the efficacy of cognitive behavioral therapy (CBT) on the reduction of headache days and headache-related disability.[1] Moreover, CBT is considered one of the behavioral treatments with grade A evidence for the prevention of migraine.[2] The identification and restructuring of cognitive distortions play a central role in cognitive therapy.[3]

Among the cognitive distortions, pain catastrophizing has been postulated as a multidimensional phenomenon composed by dimensions of rumination, magnification, and helplessness. Thus, by catastrophizing, the individual can magnify and ruminate about this experience with repetitive thoughts and believes that there is nothing he can do to deal with his pain.[4]

In the context of headache, there is a concern about the impact of coping strategies and the use of catastrophizing in relation to pain. A study conducted by Lucas et al.[5] with 1534 patients with migraine showed that pain-related catastrophizing represents one of the factors most strongly associated with non-response to treatment. It has been shown that symptoms of depression, anxiety, and pain catastrophizing are strongly associated with severe migraine-related disability.[6] In contrast, decreases in catastrophizing have been associated with a larger behavioral migraine management on headache-related disability.[7]

Pain-related catastrophizing is one of the chosen psychological variables to evaluate effectiveness in preventing drug abuse.[8] In addition, it has been associated with chronicity[9] and impaired functioning and quality of life regardless of the characteristics of migraine and psychiatric comorbidities.[10] Along with pain-related catastrophizing, some studies have pointed to the presence of unrealistic beliefs about the disease and treatment in patients with headache. For example, understanding the effectiveness of treatment within a dichotomous criterion "works/ does not work", and the use of emotional reasoning to conceive the emotions as reliable guides to assess treatment effectiveness.[11] However, the literature lacks instruments to investigate cognitive distortions in patients with migraine.

The aim of the present study was to develop and validate a new instrument to evaluate primary headache patients´cognitive distortions about their headaches and headache treatment. Furthermore, the study aimed to investigate the psychometric properties of the new instrument.

Methods

Participants and Procedure. - This is a scale development and validation study. The sample was composed of 136 patients with a migraine diagnosis made by experienced neurologists according to the International Classification of Headache Disorders 3rd Edition (beta version).[12] Exclusion criteria were psychotic disorder, cognitive impairment, or the patient lacking time to take part in the study. The participants' age ranged from 18 to 65 years old (M =43.50; SD = 12.76) and were selected among the outpatients registered at the Headache Centers of three hospitals located in the city of Porto Alegre, state capital of Rio Grande do Sul, Brazil: Hospital de Clínicas de Porto Alegre (HCPA), Irmandade Santa Casa de Misericórdia de Porto Alegre (ISCMPA), and Hospital Moinhos de Vento (HMV). The instruments were applied on one occasion, on the same day of patients' routine doctor's appointment. All participants gave written informed consent. The study received the approval by each Hospital's Institutional Review Board.

Measures-. Structured interviews were held to characterize the sample and to evaluate clinical headache parameters, such as years of diagnosis, years under treatment, headache frequency in the last three months (HF), headache intensity (HI), and screening for medication overuse headache diagnosis.

Headache Cognitive Distortions Questionnaire (HCDQ). The instrument aims to investigate primary headache patients´ cognitive distortions about their headaches and headache treatment. The process of constructing the instrument followed theoretical, empirical, and analytical procedures. Initially, 80 potential items were generated by headache specialists during the first author's doctoral internship at Johns Hopkins Headache Center. The first author worked both the construction and translation of the set of itens. The itens were based on Burns' ten categories of cognitive distortions.[13] The high number of items sought to generate a global and fine-grained first version of the instrument. Once the items were completed, they were analyzed by five specialists in headache and cognitive distortion, with the objective of analyzing each item according to two criteria: 1) relevance (belonging to the theoretical dimension); and 2) adequacy (clarity in the understanding of writing). Each expert used a scale of 0-4 (0 = not at all, 1= a little, 2 = moderately, 3 = very, 4 = extremely) to evaluate both criteria (relevance and adequacy). Items that obtained a consensus score between specialists equal to or greater than .80 were maintained. Thus, the instrument ended with 53 items to be applied in the clinical population (empirical

procedure). The response format for all items was a five-point Likert-type scale with the following values: 1= "strongly disagree", 2= "disagree",3="neutral", 4= "agree" and 5= "strongly agree". The analytical procedures corresponded to the statistical analyzes to understand the psychometric qualities of the new instrument. Sample size calculations were performed according to international guidelines.[14]

Self-Reporting Questionnaire (SRQ). The SRQ is a validated questionnaire for screening of psychiatric disorders at the primary care level.[15] It is composed of 24 questions subdivided in two subscales. The first subscale is composed by twenty questions and evaluate mood, anxiety, and somatoform disorders utilizing the SCID-IV -TR (Structured Clinical Interview for DSM-IV-TR).[16] The individual fulfills criteria for this subscale by scoring 7 or more points. Given the well-known comorbidity of migraine with mood and anxiety disorders, we utilized the mood, anxiety, and somatoform subscale.

Short Form Health Questionnaire (SF-36). The instrument is an indicator of overall health status and has eight scaled scores: vitality (VT), physical functioning (PF), bodily pain (BP), general health perceptions (GH), physical role functioning (PR), emotional role functioning (ER), social role functioning (SF), and mental health (MH).[17,18]

Headache Impact Test (HIT-6). This 6-item questionnaire[19] measures the impact of headaches on usual daily activities through questions regarding work, school, social activities, pain intensity, fatigue and bedtime, frustration, and concentration difficulties.

Each item is answered on a 5-point Likert scale (6 = never, 8 = rarely, 10 = sometimes, 11 = very often, 13 = always). The higher the score obtained, the greater the degree of impact.

Pain Catastrophizing Scale (PCS). This instrument assesses catastrophization as a style of negative cognitions related to pain.[4] Catastrophization refers to a unique construct, evaluated from three dimensions: magnification, rumination, and helplessness.

Patient Health Questionnaire (PHQ-9) and Generalized Anxiety Disorder 7 (GAD-7). PHQ-9 and GAD-7 are instruments for the evaluation of depression and anxiety according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), respectively. PHQ-9 is composed of nine items, distributed on a 4-point Likert scale: "0" (not at all) to "3" (nearly every day). The total score varies from 0 to 27, being considered a positive indicator of major depression the value greater or equal to 10. GAD- 7 is composed of seven items, distributed on a 4-point Likert scale: "0" (not at all) to "3"(nearly every day). The sum of the scores ranges from 0 to 21. Values greater than or equal to 10 are positive indicators for anxiety disorders. In the headache field, both PHQ-9 and GAD-7 have been considered reliable and valid screening instruments for major depressive disorders and generalized anxiety disorders in patients with migraine.[20,21]

Data Analysis

Descriptive statistics were performed for the participants' demographic data, including mean, standard deviation, and frequency of each study measure. The Kolmogorov – Smirnov test was used to investigate patterns of data distribution and the adequacy of using parametric tests. Psychometric properties of HCDQ were analyzed using exploratory factor analysis, Maximum Likelihood (ML) estimation method, with Varimax rotation, using RStudio software. Kaiser criterion based in eigenvalues >1 was used to identify the number of selected factors. Internal stability was analyzed using Cronbach's a coefficient. Construct validity was assessed by examining the correlations between HCDQ, psychopathological symptoms, pain catastrophizing, depression, anxiety, quality of life, and headache-related disability. The literature supports the convergent validity between these variables, given the high comorbidity between cognitive distortions, mood, and anxiety disorders.[22-24] To evaluate possible associations between HCDQ scores and sociodemographic measures, we run Pearson correlations for continuous variables (age) and T test for independent samples or one-way between-subjects ANOVA for categorical variables (income, educational level, marital status and laboral status). A linear multiple regression analysis (Stepwise method) was conducted to investigate the HCDQ relative contribution to the prediction of headache-related disability. Inferential statistics were run using SPSS (Statistical Package for Social Sciences) version 22, adopting a 5% significance level AND two-tailed testing.

Results

A total of 136 patients from the three tertiary headache centers were included. The number of patients included in the calculation varied from 106 to 136 in each measure due to some missing values. The sample was mainly composed by women (88.8%) with mean age of 43 years old and who were diagnosed with episodic migraine (75.7%). Fifteen participants (11%) met criteria for medication overuse headache. Table 1 shows demographic and clinical data of the sample.

Table 1. Demographic data (n=136)

Variable	Frequency (%) or Mean (SD)
Sex (%Female)	119 (88.8%)
Mean age (SD)	43.50(47)
Diagnosis (Episodic Migraine %)	103 (75.7%)
Employment (%Unemployed)	69 (50.7%)
Income (%<5.500 BRL)	117 (85%)
Education up to High School degree (%)	94 (69.1%)
Married or living with partner (%)	81 (59.6%)
Years of diagnosis	21.9 (14.7)
Years under treatment	9.9 (10.45)
HF/HI	28.4 (24.9) / 8.22 (2.0)

SD= standard deviation, HF= headache frequency in the last three months, HI= headache intensity attributed by the participants to the pain in the last three months in a scale ranging from 0-10

Descriptive statistics for study measures are presented in Table 2. The items for each factor and their respective factor loading are presented on Table 3. Cronbach's alpha demonstrated excellent internal consistency for the 17-item total scale (alpha=.92). Corrected item-total correlations ranged from .61 to .76. An exploratory factor analysis (EFA) was run, and items were retained considering a) higher loadings (above .60) and b) significant correlations with study measures. A two-factor solution accounted for 37% of variance. Factor 1 was labeled "Pain" and included items of catastrophizing (items 1,2,3,4,5,6,7) and emotional reasoning (item 8). Factor 2 was labeled "Treatment" and included items of labeling (item 9), discounting the positives (items 10,11, 16, 17), mental filter (item 12), jumping to conclusions (item 14), and overgeneralization (items 13,15). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was satisfactory (KMO=0.85), and the test of sphericity was significant (Bartllet=4959. 87; p<0.001).

Table 2. Descriptive Statistics of study Measures

Measure	Mean (SD)	Range
INDICCE (n=136)	49.38(14.72)	17-73
Pain Subscale	23(8.12)	8-40
Treatment Subscale	16.46(6.33)	9-37
PHQ-9 (n=133)	10.26(6.71)	0-27
GAD-7 (n=133)	10.19 (6.16)	0-21
PCS (n=133)	42.80 (12.12)	19-65
SRQ (n= 135)	10.11(4.96)	0-20
HIT-6 (n=136)	62.03 (7.93)	40-78
PF (n=133)	63.05 (29.39)	0-100
PR (n=133)	39.85 (42.87)	0-100
BP (n=133)	39.47 (22.34)	0-90
VT (n=105)	12.31 (3.77)	4-22
SF (n=133)	57.24 (28.67)	0-100
ER (n=133)	37.59 (43.31)	0-100
MH (n=133)	55.01 (10.93)	12-80
GH (n=133)	6.80 (1.69)	2-10

Note. SD = standard deviation. PHQ-9 Patient Health Questionnaire 9, GAD-7 Generalized Anxiety Disorder, PCS Pain Catastrophization Scale, SRQ Self-Report Questionnaire; HIT-6 Headache Impact Test; PF= physical functioning, PR= physical role functioning, BP= bodily pain, GH= general health perceptions, VT= vitality, SF= social role functioning, RE= emotional role functioning role, MH= and mental health

Table 3. HCDQ items, factor loadings and internal reability

Item	Factor loading	Communality (h^2)
Factor 1 - Pain (Cronbach's α = 0.88)		
1- I feel so helpless when I have a headache that I believe nothing will bring me relief.	.62	.742
2- Once my headache starts, I know that my day is lost	.60	.726
3-I will not be able to bear my headaches anymore	.66	.692
4-When I have a headache, I fear the pain will be devastating.	.70	.683
5- I will not know what to do when I have a headache.	.67	.773
6-I'm afraid my headache is a more serious health problem.	.67	.709
7- I'm afraid to die because of my headaches	.68	.714
8- Headaches must be dangerous because I feel anxious about them.	.61	.681
Factor 2 - Treatment (Cronbach's α = 0.92)		
9- My headache treatment is a failure	.77	.830
10- I usually think more about what has gone wrong in my treatment	.75	.816
11- The negative aspects of my headache treatment call me more attention than the positive ones	.73	.808
12- It seems that I am the only person who does not get a good result in the headache treatment	.63	.798
13- If my headache treatment failed today, it will always fail.	.75	.875
14- My treatment will never work	.67	.766
15-There are no medications that can help with my headaches	.70	.778
16-I do not take into account any improvement in my headaches	.67	.679
17- I do not consider what has worked in my treatment for headaches	.77	.749

Construct validity was assessed by examining correlations between HCDQ scores and the other study measures. Study measures' correlations were statistically significant, supporting construct validity. HCDQ scores were positively correlated with psychological symptoms (r=.45; p<0.01), depression (r=.49; p<0.01), anxiety (r=.52; p<0.01), pain catastrophizing (r=.59; p<0.01); headache-related disability (r=.50; p<0.01), and negatively correlated with 7 of 8 quality of life domains and time the patient was in treatment. These correlations varied in magnitude from mild (r=-.25; p<.05) to moderate (r=-.57; p<.01). Table 4 shows Correlation Matrix.

Table 4. Correlations between HCDQ subscales and other measures

Measures	HCDQ Pain	HCDQ Treatment	HCDQ Total
Psychological symptoms (SRQ)	.48**	.25**	.45**
Depression (PHQ-9)	.48**	.32**	.49**
Anxiety (GAD-7)	.49**	.36**	.52**
Pain Catastrophizing (PCS)	.71**	.22*	.59**
Disability (HIT-6)	.53**	.27**	.50**
PF	-.25**	-.16	-.25**
PR	-.33**	-.25**	-.35**
BP	-.34**	-.23**	-.35**
VT	-.31**	-.14	-.29**
SF	-.39**	-.32**	-.43**
ER	-.27**	-.19*	-.28**
MH	-.28**	-.18*	-.28**
GH	-.47**	-.45**	-.57**
Headache frequency	.21*	.44**	.36**
Headache intensity	.31**	.19*	.31**
Years of diagnosis	-.11	-.15	-.15
Years under treatment	-.20*	-.12	-.20*

*p<.05; **p<.01; SRQ= Self-report Questionnaire; PHQ-9= Patient Health Questionnaire 9; GAD-7= Generalized Anxiety Disorder, PCS= Pain Catastrophizing Scale; HIT-6 = Headache Impact Test; PF= physical functioning, PR= physical role functioning, BP= bodily pain, GH= general health perceptions, VT= vitality, SF= social role functioning, RE= emotional role functioning role, MH= and mental health.

There was a lack of correlation between HCDQ TOTAL or subscales and almost all sociodemographic variables (education, laboral status, income, and marital status). Age was only associated with total HCDQ (r=-.18; p<0.05). All hypothesized study measures correlations were statistically significant (psychiatric comorbidity, headache-related disability, headache frequency and intensity), supporting construct validity.

Furthermore, HCDQ full scale showed strong and significant (p<0.01) correlations with HCDQ Pain Subscale (r=.88) and HCDQ Treatment Subscale (r=.80). Pain Subscale accounted for 19.8% and Treatment Subscale for 17.2% of variance.

Table 5 shows a multiple linear regression (stepwise method) was conducted to investigate the HCDQ relative contribution to the prediction of headache-related disability. The newly developed scale was able to predict a unique portion of the variance in headache-related disability after accounting for well-known predictors, such as depression and headache intensity. The multicollinearity was inspected and VIF value was below 2 for all variables. Along with depression and headache intensity, HCDQ Pain subscale accounted for 46% of variance in the prediction of headache-related disability (R2 = .46).

Table 5. Predictors variables for headache-related disability

Variables	*B*	*95% IC*	*b*	*t*	*p*	$R^2_{adj.}$
Step 1					.001	
(Constant)	55.44	[53.310; 547.570]		51.50	.001	.29
Depression	.65	[.474; .821]	.546	7.395	.001	
Step 2						
(Constant)	45.14	[40.629; 49.647]		19.807	.001	.40
Depression	.52	[.352; .686]	.437	6.156	.001	
Headache Frequency	1.42	[.859; 1.979]	.357	5.017	.001	
Step 3						
(Constant)		[37.137; 46.361]		17.913	.001	.46
Depression	.37	[.200; .549]	.315	4.240	.001	
Headache Frequency	1.21	[.673; 1.756]	.305	4.440	.001	
HCDQ Pain	.29	[.141; .431]	.290	3.896	.001	

SD= standard deviation, HF= headache frequency in the last three months, HI= headache intensity attributed by the participants to the pain in the last three months in a scale ranging from 0-10

Discussion

The psychometric properties of HCDQ support its use as a new measure to evaluate primary headache patients´ cognitive distortions about their headaches and headache treatment. The new instrument showed excellent internal consistency, with Cronbach's a of 0.92 for the full scale and .88 and .92 for Pain Subscale and Treatment Subscale, respectively. Considering that cognitive distortions are a contextualized construct, the solution of two factors proved to be useful since it differentiated these distortions in relation to the pain itself and the treatment. It is possible to think that treatment beliefs might difficult treatment adherence and satisfaction, whereas pain beliefs are associated with headache-related disability, as observed in the results of the present study.

Construct validity was supported since all hypothesized study measures correlations were statistically significant. HCDQ scores showed mild, but significant positive correlations with headache frequency, headache intensity, and moderate positive correlations with psychological symptoms, depression, anxiety, depression, and pain catastrophizing. These findings are in line with prior studies evaluating the relationship between migraine and psychiatric comorbidity, specifically regarding depression and anxiety.[25,26] As noted previously, cognitive distortions are negative biases in thinking that may represent vulnerability factors for depression.[23] In addition, HCDQ scores showed mild, but significant, negative correlations with 7 of 8 quality of life domains and time the patient was in treatment, and a moderate negative correlation with general health.

These findings support the idea that these unrealistic beliefs may play an important role in patient functioning and quality of life. Along with depression and headache intensity, HCDQ Pain subscale accounted for 46% of variance in the prediction of headache-related disability. The inclusion of cognitive distortions as one of the predictors of headache-related disability together with other variables already expected (depression, headache intensity) reinforces the relevance of restructuring these unrealistic beliefs in routine treatment. As already pointed[27], possible consequence of using these distorted patterns of thought would be the overestimation of the discomfort caused by painful experience, the belief that pain will never cease, and that it will ruin the lives of these individuals. In addition, these individuals may victimize themselves, blame themselves for not being able to satisfactorily conduct work and family responsibilities and focus their thoughts on the problem of pain by mentally reliving painful episodes through negative ruminative thoughts.

Our findings have clinical and research implications. In clinical terms, cognitive restructuring of such distortions will be able to provide more realistic beliefs about headache management and treatment, reduce psychological distress, and modify possible maladaptive behaviors. In addition, sharing with the patients the evolutionary functions present in cognitive distortions may be a useful strategy to avoid a possible moralization of these unrealistic reasoning patterns, which, in turn, could increase beliefs of inadequacy and inferiority in these individuals. Thus, individuals would no longer engage in the eradication of such beliefs, but in learning more adaptive ways of managing these natural tendencies of irrationality.[28] Moreover, researchers may take these cognitions as useful indicators of a good response to the proposed treatments. Future studies may clarify the associations between these distortions and other cognitive variables such as self-efficacy and locus of control and coping strategies.

The present study has limitations. First, our findings are specific to migraine and cannot be generalized to all primary headache disorders. Second, all patients in the present study were treated in tertiary health centers and came from the Southern region of Brazil. Future investigations with patients who are not in routine treatment, and with inclusion of other primary headache diagnoses such as tension-type headache, could add further evidence of validity to HCDQ and decrease the selection bias of the sample.

In our study, HCDQ was found to be a valid and reliable measure of headache patients´ cognitive distortions about their headaches and headache treatment. The instrument shows excellent internal consistency and was significantly correlated with a variety of relevant clinical measures. Along with headache intensity and depression, HCDQ Pain subscale was considered one of the headache-related disability predictors, pointing to the clinical and research relevance of this new measure in patients with headache.

Conflict of interest: There is no conflict of interest to declare.

Authors' contributions: RVAV, BLP, WBG and GG: conception and design. RVAV, FK, RGL, LMB and VG: acquisition of data. RVAV, BLP, FK, RGL, LMB, VG, WBG and GG: analysis and interpretation of data. RVAV: drafting the manuscript. RVAV, BLP, FK, RGL, LMB, VG, WBG and GG: revising it for intellectual content. RVAV, BLP, FK, RGL, LMB, VG, WBG and GG: final approval of the completed manuscript.

Rebeca Veras De Andrade Vieira
https://orcid.org/0000-0003-2907-8699
B. Lee Peterlin
https://orcid.org/0000-0002-5298-5185
Fernando Kowacs
https://orcid.org/0000-0002-0407-407X
Renata Gomes Londero
https://orcid.org/0000-0002-9780-4739
Liselotte Menke Barea
https://orcid.org/0000-0002-9531-9115
Vanise Grassi
https://orcid.org/0000-0002-9859-9167
William Barbosa Gomes
https://orcid.org/0000-0002-6537-608X
Gustavo Gauer
https://orcid.org/0000-0002-8536-9493

References

1. Lee HJ, Lee JH, Cho EY, Kim SM and Yoon S. **Efficacy of psychological treatment for headache disorder: a systematic review and meta-analysis**. *J Headache Pain* 2019;20(1):17 Doi:10.1186/s10194-019-0965-4
2. Pérez-Muñoz A, Buse DC and Andrasik F. **Behavioral Interventions for Migraine**. *Neurol Clin* 2019;37(4):789-813 Doi:10.1016/j.ncl.2019.07.003
3. Leahy RL, Holland SJ and McGinn LK. **Treatment plans and interventions for depression and anxiety disorders**: Guilford press; 2011.
4. Sullivan MJL, Bishop, S. R. and Pivik, J. **The Pain Catastrophizing Scale: Development and validation**. *APA PsycNet* 1995;7(4):524–532 Doi:10.1037/1040-

3590.7.4.524
5. Lucas C, Lantéri-Minet M, Massiou H, Nachit-Ouinekh F, Pradalier A, Mercier F, . . . Radat F. **The GRIM2005 study of migraine consultation in France II. Psychological factors associated with treatment response to acute headache therapy and satisfaction in migraine**. *Cephalalgia* 2007;27(12):1398-1407 Doi:10.1111/j.1468-2982.2007.01446.x
6. Seng EK, Buse DC, Klepper JE, S JM, Grinberg AS, Grosberg BM, . . . Lipton RB. **Psychological Factors Associated With Chronic Migraine and Severe Migraine-Related Disability: An Observational Study in a Tertiary Headache Center**. *Headache* 2017;57(4):593-604 Doi:10.1111/head.13021
7. Seng EK and Holroyd KA. **Behavioral migraine management modifies behavioral and cognitive coping in people with migraine**. *Headache* 2014;54(9):1470-1483 Doi:10.1111/head.12426
8. Fritsche G, Frettlöh J, Hüppe M, Dlugaj M, Matatko N, Gaul C and Diener HC. **Prevention of medication overuse in patients with migraine**. *Pain* 2010;151(2):404-413 Doi:10.1016/j.pain.2010.07.032
9. Radat F, Lantéri-Minet M, Nachit-Ouinekh F, Massiou H, Lucas C, Pradalier A, . . . El Hasnaoui A. **The GRIM2005 study of migraine consultation in France. III: Psychological features of subjects with migraine**. *Cephalalgia* 2009;29(3):338-350 Doi:10.1111/j.1468-2982.2008.01718.x
10. Holroyd KA, Drew JB, Cottrell CK, Romanek KM and Heh V. **Impaired functioning and quality of life in severe migraine: the role of catastrophizing and associated symptoms**. *Cephalalgia* 2007;27(10):1156-1165 Doi:10.1111/j.1468-2982.2007.01420.x
11. Vieira RVdA, Gauer G, Souza LKd and Gomes WB. **Siempre Atento a lo Impredecible: Experiencia e Tratamiento de la Jaqueca.** *Paidéia* 2017;27(Suppl 01):413-421 Doi:10.1590/1982-432727s1201706
12. **The International Classification of Headache Disorders, 3rd edition (beta version)**. *Cephalalgia* 2013;33(9):629-808 Doi:10.1177/0333102413485658
13. Burns DD. **Feeling good: the new mood therapy**. New York: William Morrow and Company; 1980.
14. American Psychological Association and National Council on Measurement in Education. **Standards for educational and psychological testing**. Washington, DC: American Educational Association; 2014.
15. Harding TW, de Arango MV, Baltazar J, Climent CE, Ibrahim HH, Ladrido-Ignacio L, . . . Wig NN. **Mental disorders in primary health care: a study of their frequency and diagnosis in four developing countries**. *Psychol Med* 1980;10(2):231-241 Doi:10.1017/s0033291700043993
16. Gonçalves DM, Stein AT and Kapczinski F. **Performance of the Self-Reporting Questionnaire as a psychiatric screening questionnaire: a comparative study with Structured Clinical Interview for DSM-IV-TR**. *Cad Saude Publica* 2008;24(2):380-390 Doi:10.1590/s0102-311x2008000200017
17. Ware JE and Kosinski M. **Interpreting SF-36 summary health measures: a response**. *Qual Life Res* 2001;10(5):405-413; discussion 415-420 Doi:10.1023/a:1012588218728
18. Ware JE, Jr., Kosinski M, Bayliss MS, McHorney CA, Rogers WH and Raczek A. **Comparison of methods for the scoring and statistical analysis of SF-36 health profile and summary measures: summary of results from the Medical Outcomes Study**. *Med Care* 1995;33(4 Suppl):As264-279
19. Kosinski M, Bayliss MS, Bjorner JB, Ware JE, Jr., Garber WH, Batenhorst A, . . . Tepper S. **A six-item short-form survey for measuring headache impact: the HIT-6**. *Qual Life Res* 2003;12(8):963-974 Doi:10.1023/a:1026119331193
20. Seo JG and Park SP. **Validation of the Patient Health Questionnaire-9 (PHQ-9) and PHQ-2 in patients with migraine**. *J Headache Pain* 2015;16:65 Doi:10.1186/s10194-015-0552-2
21. Seo JG and Park SP. **Validation of the Generalized Anxiety Disorder-7 (GAD-7) and GAD-2 in patients with migraine**. *J Headache Pain* 2015;16:97 Doi:10.1186/s10194-015-0583-8
22. Thomas SJ and Larkin T. **Cognitive Distortions in Relation to Plasma Cortisol and Oxytocin Levels in Major Depressive Disorder**. *Front Psychiatry* 2019;10:971 Doi:10.3389/fpsyt.2019.00971
23. Rnic K, Dozois DJ and Martin RA. **Cognitive Distortions, Humor Styles, and Depression**. *Eur J Psychol* 2016;12(3):348-362 Doi: 10.5964/ejop.v12i3.1118
24. Kaplan SC, Morrison AS, Goldin PR, Olino TM, Heimberg RG and Gross JJ. **The Cognitive Distortions Questionnaire (CD-Quest): Validation in a Sample of Adults with Social Anxiety Disorder**. *Cognit Ther Res* 2017;41(4):576-587 Doi: 10.1007/s10608-017-9838-9
25. Goulart AC, Santos IS, Brunoni AR, Nunes MA, Passos VM, Griep RH, . . . Benseñor IM. **Migraine headaches and mood/anxiety disorders in the ELSA Brazil.** *Headache* 2014;54(8):1310-1319 Doi: 10.1111/head.12397
26. Peres MFP, Mercante JPP, Tobo PR, Kamei H and Bigal ME. **Anxiety and depression symptoms and migraine: a symptom-based approach research**. *J Headache Pain* 2017;18(1):37 Doi: 10.1186/s10194-017-0742-1

27. Straub R. **Health Psychology: a Biopsychosocial Approach**. New York, DC: Worth Publishers; 2005.
28. Ruth WJ. **Irrational thinking in humans: An evolutionary proposal for Ellis' genetic postulate**. *Journal of Rational-Emotive and Cognitive-Behavior Therapy* 1992;10(1):3-20 Doi: 10.1007/BF01245738