Psychology, Health & Medicine

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/cphm20

Guilt, shame and their associations with chronic diseases in Czech adults

Alena Cerna, Klara Malinakova, Jitse P. Van Dijk, Radka Zidkova & Peter Tavel

To cite this article: Alena Cerna, Klara Malinakova, Jitse P. Van Dijk, Radka Zidkova & Peter Tavel (2021): Guilt, shame and their associations with chronic diseases in Czech adults, Psychology, Health & Medicine, DOI: 10.1080/13548506.2021.1903058

To link to this article: https://doi.org/10.1080/13548506.2021.1903058

© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

Published online: 17 Aug 2021.

Submit your article to this journal

Article views: 28

View related articles

View Crossmark data

Full Terms & Conditions of access and use can be found at
https://www.tandfonline.com/action/journalInformation?journalCode=cphm20

PSYCHOLOGY, HEALTH & MEDICINE
https://doi.org/10.1080/13548506.2021.1903058

Taylor & Francis
Taylor & Francis Group

OPEN ACCESS Check for updates

Guilt, shame and their associations with chronic diseases in Czech adults

Alena Cerna[a], Klara Malinakova[a], Jitse P. Van Dijk[a,b,c], Radka Zidkova[a,b] and Peter Tavel[a]

[a]Olomouc University Social Health Institute, Palacky University Olomouc, Olomouc, Czech Republic; [b]Department of Community and Occupational Medicine, University Medical Center Groningen, University of Groningen, Groningen, The Netherlands; [c]Graduate School Kosice Institute for Society and Health, P.J. Safarik University in Kosice, Kosice, Slovak Republic

ABSTRACT

The interest in the association between feelings of guilt and shame and psychological health is growing. However, less attention so far has been paid to the associations with chronic disease. Therefore, the aim of this study was to explore whether feelings of guilt and shame are related to physical health in chronic disease and in selected ones. A nationally representative sample of Czech adults (n = 1000, age = 46.0 ± 17.3 years, 48.6% men) participated in the survey. Feelings of guilt and shame (items from The Positive and Negative Affect Schedule) and health problems in selected chronic diseases were measured. Respondents with higher feelings of guilt – but not of shame – were more likely to suffer from a chronic disease; we found this in arthritis, back pain, cardiovascular disease, asthma, cancer and depression or anxiety. The association was strongest in the case of cancer with odds ratios (OR) 5.83 (95% confidence interval (CI) 2.27–16.69). There were no significant associations in case of diabetes and stroke. Feelings of shame were not related to chronic diseases. Our findings suggest that feelings of guilt are associated with worse physical health. Further research is needed in this area.

ARTICLE HISTORY
Received 29 October 2020
Accepted 9 March 2021

KEYWORDS
Shame; guilt; physical health; chronic diseases

Introduction

Both shame and guilt are connected with the experience of failure. Although they are often confused in common language, they cannot be combined into one homogeneous emotion. Quantitative (Cacciatore et al., 2013) as well as qualitative (Gibson, 2016; Tangney et al., 1996) studies show that guilt and shame are two separate emotions. They differ in their dynamics, context, and accompanying emotions. These two emotions also vary with interindividually different evoked behaviors in the situations and the character of the experience itself. Tangney et al. (1996) showed that interindividual differences can be explained more by the judgments and feelings connected with the experience and the subsequent behavior that provokes the situation than by the number

CONTACT Radka Zidkova r.zidkova@rug.nl OUSHI - Olomouc University Social Health Institute Palacky University Olomouc, Univerzitni 244/22, 771 11, Olomouc, Czech Republic

© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.
This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

of witnesses present, which contrasted the earlier convictions that shame is a more public emotion, whereas guilt is a more private affair (Ausubel, 1955).

Shame is associated with the desire to undo aspects of the self (Niedenthal et al., 1994). According to Velotti et al. (2017), frequent shame experiences can develop into the form of a tendency to feel shame in general. However, the concept of guilt as an urge to change some aspects of behavior, was related to a superego response to unacceptable impulses (Eisenberg, 2000). In this approach, guilt became a weaker contributor to psychopathology. The image of guilt is also considered as an adaptive emotion implying prosocial behavior (Tangney, 1995) and strengthening the sense of control in the world (Lindsayhartz, 1984). There are many studies focusing on relationships of guilt with poorer mental health, and some studies focusing on its relationships with physical health.

Many studies report an association of guilt and shame with a worse mental health especially in some chronic diseases (Crosskey et al., 2015; Dearing et al., 2005; Exline et al., 2000; Lee et al., 2001), e.g., in depression (Andrews et al., 2002; Bennett et al., 2010; Oconnor et al., 1997). Other studies have documented the relationship between shame with many other phenomena: low self-esteem, aggressiveness and hostility (Baumeister et al., 1994; Bennett et al., 2010; Garofalo et al., 2016; Orth et al., 2010). Personality shame- and guilt-proneness had positive correlations with grief and psychological adaptation after loss among bereaved mothers (Barr, 2012; Barr & Cacciatore, 2007). Shame and guilt may exacerbate and perpetuate symptoms of posttraumatic stress disorder (Lee et al., 2001; Leskela et al., 2002). Shame-proneness was positively correlated with substance use problems, while guilt-proneness was inversely related (Dearing et al., 2005). Lower tendency to experience shame was significantly associated with more satisfaction and with less emotional exhaustion that could lead to burnout (Barnard & Curry, 2012; Crosskey et al., 2015).

Less attention has been paid to the potential impact of these individual emotions on physical health. However, there are some exceptions in this respect, e.g., studies describing the association of feelings of guilt related to punishing reactions from significant others with pain complaints among patients with chronic spinal cord injury pain (Conant, 1998). Furthermore, guilt was positively associated with the uncertainty about the diagnosis and disability among patients with low back pain (Serbic & Pincus, 2014; Serbic et al., 2016). Guilt and shame were also positively related to how the patients with hypercholesterolemia manage their condition (Frich et al., 2007) and to the belief that one caused one's own cancer (Abrams & Finesinger, 1953; LoConte et al., 2008). Nevertheless, some studies have not found any associations, e.g., Ten Klooster et al. (2014) found no significant relationship between guilt, shame and the severity of rheumatoid arthritis.

The inconsistency of these findings shows the need of further research in this area, especially with regards to physical health. Therefore, the aim of this study is to assess the associations of guilt and shame with self-rated health in chronic disease and in selected ones.

Methods

Participants and procedure

We obtained a national sample of the Czech population aged fifteen years and older using a two-step procedure. In the first step, the questionnaire and all further procedures were piloted among 109 participants. This led to the final version of the survey. A sample for the

main analysis was derived using a Power analysis, which indicated that with 80% power, a sample size of 1000 respondents would be large enough to detect small effect sizes (OR = 1.43; OR = 0.70). In the second step, another 1215 participants were randomly chosen with the help of quota sampling; and asked to participate in a study on the problematics of health, life experiences and attitudes and lifestyle. Of these respondents, 215 (17.7%) refused to participate in the survey. Among the main reasons for refusal, participants reported a lack of time (45.6%), a lack of interest or reluctance to fill the survey (22.1%), the length and difficulty of the survey (19.1%), 8.8% declined to participate for considering the questions unnecessary or did not participate in research at all. Finally, 3.4% of respondents expressed concerns about misuse of the provided answers or stated other reasons. Data was collected by professionally trained administrators November and December 2014 by a standardized interview with the respondents (face-to-face). Participation in the survey was anonymous and voluntary. The final sample consisting of 1000 respondents; a representative sample of the Czech population aged fifteen years and over with regards to age (mean age 46, SD = 17.3), sex (48.6% men), education (primary 8.4%, secondary 76.1% and university 15.5%) and regional affiliation.

According to the Czech law by the time of the study a protocol needed approval of an Ethics Committee only if medicines were used; we carefully followed the latest version of the Declaration of Helsinki.

Measures

The Positive and Negative Affect Schedule (PANAS) is a 20-items scale comprising two mood scales, the Positive and the Negative Affect. Ten descriptors are used for each scale. The whole scale consists of 20-items. Respondents were asked to report the extent of feeling different emotions during the past week using a 5-point scale ranging from 'very slightly' or 'not at all' (1) to 'extremely' (5). For the purpose of this study, we chose the items 'guilty' and 'ashamed'. For each item, participants who chose the option 'not at all' or 'very slightly' were considered as not experiencing shame and guilt or experiencing them only to a very limited extent, while the rest as experiencing these feelings often. The items were translated from English to Czech independently by two native speakers who agreed on the translations used.

Responses to the item that evaluates self-rated health were also dichotomized; responses 'excellent', 'very good' and 'good' were considered as perceiving health as subjectively good, the options 'quite good' and 'bad' as poor.

Presence of a chronic disease was measured by the question: „Do you have a long-standing illness or disability? Please mark everything that applies to you", with following possibilities: arthritis, back pain, heart problems, asthma, cancer, depression or anxiety, diabetes, cerebrovascular accident/stroke, or none of those.

The background characteristics *gender, age* and other basic *socio-demographic characteristics* were obtained by the questionnaire.

Statistical analyses

First, we described the background characteristics of the sample and compared different sociodemographical groups using the Kruskal-Wallis test. Then, we assessed the

associations of guilt, shame and any chronic disease; next between guilt, shame and eight kinds of chronic diseases using a multinomial logistic regression model adjusted for gender, age and education. Each of the independent variables was assessed in a separate model. All analyses were performed using the statistical software package IBM SPSS version 21.

Results

The description of the study population is shown in Table 1. Of the whole sample, 57.9% respondents reported the presence of some of the diseases (see Table 2). Furthermore, 17.7% reported feelings of guilt and 16.8% feelings of shame.

A non-parametric comparison between different sociodemographic groups showed no statistically significant differences (results not shown). Table 2 shows the prevalence of all chronic diseases and the selected ones in the sample and the prevalence of feelings of guilt and shame within the groups of respondents with chronic diseases.

Results of binary logistic regression adjusted for gender, age and education showed that respondents with higher feelings of guilt were two times more likely to report some chronic disease with odds ratio (OR) 2.0; 95%-confidence interval (CI) 1.37–2.92, $p < 0.001$). Furthermore, results of the multinomial regression adjusted for gender, age

Table 1. Description of the study population.

	Total n (%)	Guilt[a] n (%)[b]	Shame[a] n (%)[b]
Total	1000 (100)	177 (17.7)	168 (16.8)
Gender			
Male	486 (48.6)	83 (8.3)	87 (8.7)
Female	514 (51.4)	94 (9.4)	81 (8.1)
Age			
15–29 years old	227 (22.7)	45 (4.5)	36 (3.6)
30–45 years old	283 (28.3)	62 (6.2)	54 (5.4)
46–59 years old	216 (21.6)	35 (3.5)	29 (2.9)
60 and more	274 (27.4)	35 (3.5)	49 (4.9)
Way of life			
With somebody (husband/wife, spouse, parents, siblings)	815 (50.0)	136 (13.6)	133 (13.3)
Alone	185 (18.5)	41 (4.1)	35 (3.5)
Highest education achieved			
Elementary school	84 (8.4)	17 (1.7)	14 (1.4)
Secondary vocational school	326 (32.6)	60 (6.0)	59 (5.9)
Secondary school with graduation	435 (43.5)	77 (7.7)	69 (6.9)
College	155 (15.5)	23 (2.3)	26 (2.6)
Economic activity			
Employee	509 (50.9)	83 (8.3)	82 (8.2)
Self-employed	100 (10.0)	23 (2.3)	23 (2.3)
In the household[c]	23 (2.3)	7 (0.7)	5 (0.5)
Unemployed	23 (2.3)	6 (0.6)	5 (0.5)
Student	101 (10.1)	21 (2.1)	13 (1.3)
Disabled	55 (5.5)	10 (1.0)	9 (0.9)
Old-age pensioner	187 (18.7)	27 (2.7)	36 (3.6)
Relation to faith			
Believer	277 (27.7)	53 (5.3)	52 (5.2)
Non-believer	563 (56.3)	101 (10.1)	94 (9.4)
Convinced atheist	160 (16.0)	23 (2.3)	22 (2.2)

Note: [a] Only the respondents with the occurrence of feelings of guilt or shame are presented.
[b]Percentage of the total number of people reporting increased feelings of shame and guilt
[c]Including maternity leave

Table 2. Prevalence of all chronic diseases and the selected ones in the sample and prevalence of feelings of shame and guilt in total and separately among the respondents with concrete diseases.

Disease	Total n (%)	Guilt[a] n (%)[b]	Shame[a] n (%)[b]
Healthy	421 (42.1)	62 (14.7)	62 (14.7)
Chronic disease	579 (57.9)	115 (19.9)	106 (18.3)
Arthritis[c]	76 (7.6)	16 (21.1)	16 (21.1)
Asthma	73 (7.3)	20 (27.4)	9 (12.3)
Back pain	313 (31.3)	67 (21.4)	64 (20.4)
Cancer	23 (2.3)	8 (34.8)	7 (30.4)
Cardiovascular disease	106 (10.6)	21 (19.8)	23 (21.7)
Depression	72 (7.2)	26 (36.1)	17 (23.6)
Diabetes	128 (12.8)	19 (14.8)	21 (16.4)
Stroke	13 (1.3)	3 (23.1)	4 (30.8)

Note [a] Only the respondents with the occurrence of feelings of guilt or shame are presented.
[b]Percent of the total number of people reporting increased feelings of shame and guilt
[c]Participants may have more than one chronic disease

and education, as presented in Table 3, showed that respondents with higher feelings of guilt were also more likely to suffer from arthritis, asthma, back pain, cancer, cardiovascular disease, depression. The association was the strongest in the case of cancer with OR 5.83; 95%CI (2.17–15.69, $p < 0.001$). On the contrary, there were no significant associations of the feelings of shame with individual health problems.

Discussion

The aim of this study was to assess the associations of feelings of guilt, shame and physical health in chronic disease and in selected ones. We found no significant differences between the sociodemographic groups regarding the prevalence of feelings of guilt

Table 3. Associations of physical health with guilt and shame in any chronic disease and in selected chronic diseases: results of multinomial logistic regressions with the healthy respondents being the reference category, adjusted for age, gender and education, leading to odds ratios (OR) with 95% confidence intervals (95%CI).

	Any	Selected chronic diseases			
	chronic disease	**Arthritis**	**Asthma**	**Back pain**	**Cancer**
Feelings of guilt					
Yes vs. No	**2.00*** (1.37–2.92)**	**2.88** (1.44–5.76)**	**2.51** (1.38–4.54)**	**2.24*** (1.47–3.42)**	**5.83 *** (2.17–15.69)**
Feelings of shame					
Yes vs. No	1.29 (0.89–1.89)	1.63 (0.83–3.19)	0.81 (0.38–1.73)	1.49 (0.98–2.28)	2.62 (0.99–6.97)
	Cardiovascular diseases	**Depression**	**Diabetes**	**Stroke**	
Feelings of guilt					
Yes vs. No	**2.71*** (1.46–5.02)**	**4.39*** (2.43–7.76)**	1.69 (0.91–3.16)	3.17 (0.79–12.70)	
Feelings of shame					
Yes vs. No	1.71 (0.95–3.01)	1.78 (0.96–3.33)	1.12 (0.62–2.05)	2.64 (0.76–9.14)	

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

and shame. However, we found strong associations of feelings of guilt and of self-rated health with having a chronic disease and with several selected ones (arthritis, asthma, back pain, cancer, cardiovascular disease, depression). Feelings of shame were not related to chronic diseases.

We found that higher feelings of guilt were associated with chronic disease and with six of the eight observed chronic diseases. The relationship that we found between guilt and several chronic diseases could be interpreted as an outcome of the influence of self-conscious emotions on the system supposed to regulate them. According to Dickerson et al. (2004) self-related emotions can cause changes in biological processes underlying psychological ones. A higher level of guilt was found to be associated with a significant increase of cortisol level among respondents exhibited to a social-evaluative situations (Gruenewald et al., 2004) and (together with anger and pride) with cardiovascular reactivity and peripheral resistance (Herrald & Tomaka, 2002). The guilt-prone individuals might be more likely to experience higher productivity of the part of endocrine glands system, which may result in the form of increased susceptibility to inflammatory processes (Dickerson et al., 2004). They are involved in the development of asthma (Rosenkranz et al., 2005; Runeson et al., 2011) or atherosclerosis (Ridker et al., 1997; Ross, 1999).

On the other hand, our results need to be interpreted with caution as the cross-sectional nature of the study does not allow us to conclude on causality. Serbic and Pincus (2014) reported a higher level of guilt among patients with chronic low-back pain due to pain intensity and disability, hence guilt could be seen as a consequence of suffering of an illness. Similarly, asthma, arthritis, cardiovascular diseases, depression and especially cancer (with its treatment and aftermath) may be limiting in full experiencing of life, so the patients may experience guilt, anger and frustration (e.g., (Conant, 1998; Else-Quest et al., 2009). The feelings of guilt might be also associated with the awareness of one's lifestyle and not following medical advice and/or violating the principles of healthy lifestyle (LoConte et al., 2008). The relationship of different lifestyles to various types of cancer is well documented (Baan et al., 2007; Center et al., 2009; Garcia-Alvarez et al., 2007), as well as to cardiovascular diseases (Gorostegi-Anduaga et al., 2017), back pain (Hoy et al., 2010) and other chronic diseases (Ross, 1999; Ten Klooster et al., 2014).

We also observed a higher prevalence of guilt in respondents with depression, which could be considered a specific case, because feelings of excessive or inappropriate guilt is one of the specific symptoms of major depressive disorder according to DMS-IV (Diagnostic and Statistical Manual of Mental Disorders). The relationship between depression and guilt is demonstrated also by O'Connor et al. (O'Connor et al., 2002). At the same time, shame- and guilt-proneness are by some authors (Young et al., 2016) considered as contributors to the development of depressive symptoms.

However, though we have found the association of guilt with physical health in a number of chronic diseases, we have not found any no association of shame with physical health in chronic diseases. This finding contradicts the frequent claim of the greater destructive influence of shame than guilt (Boudewyns et al., 2013; Tangney et al., 1996). The difference of our findings may indicate that our respondents did not manage to empathize to the state based on the word 'ashamed', or that they misunderstood the concept of shame, which is not in the Czech language so commonly used as the term 'guilt'.

Strenghts and limitations

This study has several important strengths, the most important being the large and representative sample with no missing values. A limitation is the cross-sectional design of the study, which does not allow to deduce the direction of causality. Some categories of diseases also had very few respondents (e.g., cancer), which could influence the statistical analyses, although the same outcome was found in chronic disease. Another limitation is the wording of the questions using the term 'shame', which could had a negative impact on the understanding of the statement. Our method of data collection (a face-to-face interview) could also possibly influence answers of the respondents in a socially desirable way. On the other hand, respondents were informed about maintaining anonymity and the trained administrators were neutral, unknown persons.

Implications

Our findings show that the feelings of guilt are associated with physical health in chronic disease while feelings of shame are not. Guilt can greatly influence the quality of life of people with a chronic disease, this is the direction most studied in the literature. However, it can also play a direct role in the development of the chronic disease and should therefore be considered an important topic in the clinical area. Addressing these negative emotions could represent an important aspect of a psychotherapeutic and also clinician's care when assessing and treating patients with chronic diseases. Thus, keeping in mind the importance of a possible role of mental phenomena in physical health is essential, regardless of the direction of a causality, and a cooperation between mental and physical health professionals should be developed and deepened. Clinicians and other healthcare workers should be adequately trained to recognize signs of psychological distress and should closely cooperate with psychologists and psychotherapists in order to address exaggerated feelings of guilt and shame. Next, healthcare providers should be encouraged to create a safe environment for their patients. The strength of the associations implies the importance of the topic and the need of a more detailed research in this area. Further research should assess these phenomena with the use of a more detailed questionnaire and focus on unravelling the causality.

Conclusions

The present study is one of the few that explores the relationship between guilt/shame and physical health in chronic disease and in selected ones in a representative sample. We found a positive association between guilt and in chronic disease and in six of the eight selected ones, but not between shame and chronic disease and the selected ones.

Acknowledgments

This study was supported by the Grant Agency of the Czech Republic, project Biological and Psychological Aspects of Spiritual Experience and Their Associations With Health (Contract No. 19-19526S) and by the Sts Cyril and Methodius Faculty of Theology of the Palacký University Olomouc internal project Spiritual, Psychological, Social and Biological Determinants of Health (grant number IGA-CMTF-2020-006).

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the Grant Agency of the Czech Republic [19-19526S].

ORCID

Alena Cerna http://orcid.org/0000-0003-1197-7733
Klara Malinakova http://orcid.org/0000-0001-6939-1204
Peter Tavel http://orcid.org/0000-0001-7072-001X

References

Abrams, R. D., & Finesinger, J. E. (1953). Guilt reactions in patients with cancer. *Cancer*, *6*(3), 474–482. https://doi.org/10.1002/1097-0142(195305)6:3<474 aid-cncr2820060305>3.0.co;2-p

Andrews, B., Qian, M. Y., & Valentine, J. D. (2002). Predicting depressive symptoms with a new measure of shame: The experience of shame scale. *British Journal of Clinical Psychology*, *41*(1), 29–42. https://doi.org/10.1348/014466502163778

Ausubel, D. P. (1955). Relationship between shame and guilt in the socializing process. *Psychological Review*, *62*(5), 378–390. https://doi.org/10.1037/h0042534

Baan, R., Straif, K., Grosse, Y., Secretan, B., El Ghissassi, F., Bouvard, V., … Monograph, W. H. O. I. A. R. C. (2007). Carcinogenicity of alcoholic beverages. *Lancet Oncology*, *8*(4), 292–293. https://doi.org/10.1016/s1470-2045(07)70099-2

Barnard, L. K., & Curry, J. F. (2012). The relationship of clergy burnout to self-compassion and other personality dimensions. *Pastoral Psychology*, *61*(2), 149–163. https://doi.org/10.1007/s11089-011-0377-0

Barr, P. (2012). Negative self-conscious emotion and grief: An actor–partner analysis in couples bereaved by stillbirth or neonatal death. *Psychology and Psychotherapy: Theory, Research and Practice*, *85*(3), 310–326. https://doi.org/10.1111/j.2044-8341.2011.02034.x

Barr, P., & Cacciatore, J. (2007). Problematic emotions and maternal grief. *Omega-Journal of Death and Dying*, *56*(4), 331–348. https://doi.org/10.2190/OM.56.4.b

Baumeister, R. F., Stillwell, A. M., & Heatherton, T. F. (1994). Guilt - an interpersonal approach. *Psychological Bulletin*, *115*(2), 243–267. https://doi.org/10.1037/0033-2909.115.2.243

Bennett, D. S., Sullivan, M. W., & Lewis, M. (2010). Neglected children, shame-proneness, and depressive symptoms. *Child Maltreatment*, *15*(4), 305–314. https://doi.org/10.1177/1077559510379634

Boudewyns, V., Turner, M. M., & Paquin, R. S. (2013). Shame-free guilt appeals: Testing the emotional and cognitive effects of shame and guilt appeals. *Psychology & Marketing*, *30*(9), 811–825. https://doi.org/10.1002/mar.20647

Cacciatore, J., Froen, F., & Killian, M. (2013). The effects of self-blame on anxiety and depression among women who have experienced stillbirth. *Journal of Mental Health Counseling*, *35*(4), 342–359. https://doi.org/10.17744/mehc.35.4.15427g822442h11m

Center, M. M., Jemal, A., & Ward, E. (2009). International trends in colorectal cancer incidence rates. *Cancer Epidemiology Biomarkers & Prevention*, *18*(6), 1688–1694. https://doi.org/10.1158/1055-9965.epi-09-0090

Conant, L. L. (1998). Psychological variables associated with pain perceptions among individuals with chronic spinal cord injury pain. *Journal of Clinical Psychology in Medical Settings*, *5*(1), 71–90. https://doi.org/10.1023/a:1026205919997

Crosskey, L. B., Curry, J. F., & Leary, M. R. (2015). Role transgressions, shame, and guilt among clergy. *Pastoral Psychology*, *64*(6), 783–801. https://doi.org/10.1007/s11089-015-0644-6

Dearing, R. L., Stuewig, J., & Tangney, J. P. (2005). On the importance of distinguishing shame from guilt: Relations to problematic alcohol and drug use. *Addictive Behaviors*, *30*(7), 1392–1404. https://doi.org/10.1016/j.addbeh.2005.02.002

Dickerson, S. S., Gruenewald, T. L., & Kemeny, M. E. (2004). When the social self is threatened: Shame, physiology, and health. *Journal of Personality*, *72*(6), 1191–1216. https://doi.org/10.1111/j.1467-6494.2004.00295.x

Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual Review of Psychology*, *51*(1), 665–697. https://doi.org/10.1146/annurev.psych.51.1.665

Else-Quest, N. M., LoConte, N. K., Schiller, J. H., & Hyde, J. S. (2009). Perceived stigma, self-blame, and adjustment among lung, breast and prostate cancer patients. *Psychology & Health*, *24*(8), 949–964. https://doi.org/10.1080/08870440802074664

Exline, J. J., Yali, A. M., & Sanderson, W. C. (2000). Guilt, discord, and alienation: The role of religious strain in depression and suicidality. *Journal of Clinical Psychology*, *56*(12), 1481–1496. https://doi.org/10.1002/1097-4679(200012)56:12<1481::aid-1>3.0.co;2-a

Frich, J. C., Malterud, K., & Fugelli, P. (2007). Experiences of guilt and shame in patients with familial hypercholesterolemia: A qualitative interview study. *Patient Education and Counseling*, *69*(1–3), 108–113. https://doi.org/10.1016/j.pec.2007.08.001

Garcia-Alvarez, A., Serra-Majem, L., Ribas-Barba, L., Castella, C., Foz, M., Uauy, R., . . . Salleras, L. (2007). Obesity and overweight trends in Catalonia, Spain (1992-2003): Gender and socio-economic determinants. *Public Health Nutrition*, *10*(11A), 1368–1378. https://doi.org/10.1017/s1368980007000973

Garofalo, C., Holden, C. J., Zeigler-Hill, V., & Velotti, P. (2016). Understanding the connection between self-esteem and aggression: The mediating role of emotion dysregulation. *Aggressive Behavior*, *42*(1), 3–15. https://doi.org/10.1002/ab.21601

Gibson, M. (2016). Social worker shame: A scoping review. *British Journal of Social Work*, *46*(2), 549–565. https://doi.org/10.1093/bjsw/bcu140

Gorostegi-Anduaga, I., Perez-Asenjo, J., Aispuru, G. R., Fryer, S. M., Alonso-Colmenero, A., Romaratezabala, E., & Maldonado-Martin, S. (2017). Assessment of cardiovascular risk and vascular age in overweight/obese adults with primary hypertension: The EXERDIET-HTA study. *Blood Pressure Monitoring*, *22*(3), 154–160. https://doi.org/10.1097/mbp.0000000000000247

Gruenewald, T. L., Kemeny, M. E., Aziz, N., & Fahey, J. L. (2004). Acute threat to the social self: Shame, social self-esteem, and cortisol activity. *Psychosomatic Medicine*, *66*(6), 915–924. https://doi.org/10.1097/01.psy.0000143639.61693.ef

Herrald, M. M., & Tomaka, J. (2002). Patterns of emotion-specific appraisal, coping, and cardiovascular reactivity during an ongoing emotional episode. *Journal of Personality and Social Psychology*, *83*(2), 434–450. https://doi.org/10.1037//0022-3514.83.2.434

Hoy, D., Brooks, P., Blyth, F., & Buchbinder, R. (2010). The Epidemiology of low back pain. *Best Practice & Research in Clinical Rheumatology*, *24*(6), 769–781. https://doi.org/10.1016/j.berh.2010.10.002

Lee, D. A., Scragg, P., & Turner, S. (2001). The role of shame and guilt in traumatic events: A clinical model of shame-based and guilt-based PTSD. *British Journal of Medical Psychology*, *74*(4), 451–466. https://doi.org/10.1348/000711201161109

Leskela, J., Dieperink, M., & Thuras, P. (2002). Shame and posttraumatic stress disorder. *Journal of Traumatic Stress*, *15*(3), 223–226. https://doi.org/10.1023/a:1015255311837

Lindsayhartz, J. (1984). Contrasting experiences of shame and guilt. *American Behavioral Scientist*, *27*(6), 689–704. https://doi.org/10.1177/000276484027006003

LoConte, N. K., Else-Quest, N. A., Eickhoff, J., Hyde, J., & Schiller, J. H. (2008). Assessment of guilt and shame in patients with non-small-cell lung cancer compared with patients with breast and prostate cancer. *Clinical Lung Cancer*, *9*(3), 171–178. https://doi.org/10.3816/CLC.2008.n.026

Niedenthal, P. M., Tangney, J. P., & Gavanski, I. (1994). "If only I weren't" versus "if only I hadn't": Distinguishing shame and guilt in counterfactual thinking. *Journal of Personality and Social Psychology*, *67*(4), 585–595. https://doi.org/10.1037//0022-3514.67.4.585

O'Connor, L. E., Berry, J. W., Weiss, J., & Gilbert, P. (2002). Guilt, fear, submission, and empathy in depression. *Journal of Affective Disorders*, *71*(1–3), 19–27. https://doi.org/10.1016/s0165-0327(01)00408-6

Oconnor, L. E., Berry, J. W., Weiss, J., Bush, M., & Sampson, H. (1997). Interpersonal guilt: The development of a new measure. *Journal of Clinical Psychology*, *53*(1), 73–89. https://doi.org/10.1002/(sici)1097-4679(199701)53:1<73:: aid-jclp10>3.0.co;2-i

Orth, U., Robins, R. W., & Soto, C. J. (2010). Tracking the trajectory of shame, guilt, and pride across the life span. *Journal of Personality and Social Psychology*, *99*(6), 1061–1071. https://doi.org/10.1037/a0021342

Ridker, P. M., Cushman, M., Stampfer, M.J., Tracy, R.P., & Hennekens, C.H. (1997). Inflammation, aspirin, and the risk of cardiovascular disease in apparently healthy men (vol 336, pg 973, 1997). *New England Journal of Medicine*, *336*, 973–979.

Rosenkranz, M. A., Busse, W. W., Johnstone, T., Swenson, C. A., Crisafi, G. M., Jackson, M. M., … Davidson, R. J. (2005). Neural circuitry underlying the interaction between emotion and asthma symptom exacerbation. *Proceedings of the National Academy of Sciences of the United States of America*, *102*(37), 13319–13324. https://doi.org/10.1073/pnas.0504365102

Ross, R. (1999). Atherosclerosis is an inflammatory disease. *American Heart Journal*, *138*(5), S419–S420. https://doi.org/10.1016/s0002-8703(99)70266-8

Runeson, R., Wahlstedt, K., & Norback, D. (2011). Pilot study of personality traits assessed by the Karolinska scales of personality (KSP) in asthma, atopy, and rhinitis. *Perceptual and Motor Skills*, *113*(3), 909–920. https://doi.org/10.2466/02.09.15.pms.113.6.909-920

Serbic, D., & Pincus, T. (2014). Pain-related guilt in low back pain. *Clinical Journal of Pain*, *30*(12), 1062–1069. https://doi.org/10.1097/ajp.0000000000000059

Serbic, D., Pincus, T., Fife-Schaw, C., & Dawson, H. (2016). Diagnostic uncertainty, guilt, mood, and disability in back pain. *Health Psychology*, *35*(1), 50–59. https://doi.org/10.1037/hea0000272

Tangney, J. P. (1995). Recent advances in the empirical-study of shame and guilt. *American Behavioral Scientist*, *38*(8), 1132–1145. https://doi.org/10.1177/0002764295038008008

Tangney, J. P., Miller, R. S., Flicker, L., & Barlow, D. H. (1996). Are shame, guilt, and embarrassment distinct emotions? *Journal of Personality and Social Psychology*, *70*(6), 1256–1269. https://doi.org/10.1037/0022-3514.70.6.1256

Ten Klooster, P. M., Christenhusz, L. C. A., Taal, E., Eggelmeijer, F., Van Woerkom, J.-M., & Rasker, J. J. (2014). Feelings of guilt and shame in patients with rheumatoid arthritis. *Clinical Rheumatology*, *33*(7), 903–910. https://doi.org/10.1007/s10067-014-2516-3

Velotti, P., Garofalo, C., Bottazzi, F., & Caretti, V. (2017). Faces of shame: Implications for self-esteem, emotion regulation, aggression, and well-being. *Journal of Psychology*, *151*(2), 171–184. https://doi.org/10.1080/00223980.2016.1248809

Young, C. M., Neighbors, C., Dibello, A. M., Traylor, Z. K., & Tomkins, M. (2016). Shame and guilt-proneness as mediators of associations between general causality orientations and depressive symptoms. *Journal of Social and Clinical Psychology*, *35*(5), 357–370. https://doi.org/10.1521/jscp.2016.35.5.357