



Published in final edited form as:

CNS Spectr. 2015 April ; 20(2): 130–139. doi:10.1017/S1092852914000182.

Prevalence and Correlates of Anger in the Community: Results from a National Survey

Mayumi Okuda¹, Julia Picazo², Mark Olfson¹, Deborah S. Hasin^{1,3}, Shang-Min Liu¹, Silvia Bernardi¹, and Carlos Blanco¹

¹Department of Psychiatry, New York State Psychiatric Institute, College of Physicians and Surgeons of Columbia University, New York, NY, USA

²Instituto de Investigaciones Neuropsiquiátricas Dr. López Ibor, Madrid, Spain

³Department of Epidemiology, Mailman School of Public Health, College of Physicians and Surgeons of Columbia University, New York, NY, USA

Abstract

Introduction—Little is known about the prevalence and correlates of anger in the community.

Methods—We used data derived from a large national sample of the United States population which included more than 34,000 adults ages 18 years and older. We defined inappropriate, intense, or poorly controlled anger by means of self-report of: 1) anger that was triggered by small things or that was difficult to control; 2) frequent temper outbursts or anger that lead to loss of control; or 3) hitting people or throwing objects in anger.

Corresponding author: Mayumi Okuda, Department of Psychiatry, New York State Psychiatric Institute, College of Physicians and Surgeons of Columbia University, 1051 Riverside Drive, Box #81, New York, NY 10032. Contact: mo2339@columbia.edu. Phone: 646-774-6337 Fax: 212-543-5356 Preferred email printed.

Disclosure information: Mayumi Okuda does not have anything to disclose.

Julia Picazo does not have anything to disclose.

Mark Olfson has the following disclosure:

- Agency for Healthcare Research & Quality, Grant U18 HS021112, Research support

Deborah Hasin has the following disclosures:

- NIAAA, Grant (K05 AA0142), Grant recipient
- NIAAA, Grant (U01 AA0181), Grant recipient
- New York State Psychiatric Institute, Employee, Salary

Shang-min Liu does not have anything to disclose.

Silvia Bernardi has the following disclosure:

- NIMH, Grant R25:MH086466—03, Priming t???, Grant recipient

Carlos Blanco has the following disclosures:

- NIH, Grant MH82773, Grant recipient
- NIH, Grant MH076051, Grant recipient
- NIDA, Grant DA019606, Grant recipient
- National Cancer Institute, Grant CA133050, Grant recipient
- NYSPI, Employee, Salary

Results—The overall prevalence of inappropriate, intense, or poorly controlled anger in the U.S. population was 7.8%. Anger was especially common among men and younger adults, and was associated with decreased psychosocial functioning. Significant and positive associations were evident between anger and parental factors, childhood, and adulthood adverse events. There were strong associations between anger and bipolar disorder, drug dependence, psychotic disorder, borderline, and schizotypal personality disorders. There was a dose-response relationship between anger and a broad range of psychopathology.

Conclusions—A rationale exists for developing screening tools and early intervention strategies, especially for young adults, to identify and help reduce anger.

Keywords

adverse life events; anger; epidemiology; personality disorders; psychiatric comorbidity

Prevalence and Correlates of Anger in the Community: Results from a National Survey

Anger is a common symptom among adults seeking outpatient mental health treatment. Anger, because it is often associated with substantial hostility and aggression,¹ may be clinically significant. In one study including 1,300 adults presenting for outpatient psychiatric treatment, approximately half reported experiencing a moderate to severe level of anger and about one quarter reported extreme anger leading to aggressive behavior.² In extreme or dysfunctional forms, anger may also lead to adverse health consequences,³ and trigger maladaptive behaviors including workplace hostility,⁴ domestic violence,⁵ and criminal behavior.⁶

In clinical samples, anger has been associated with a wide range of psychiatric disorders. Anger is common among patients with depression and anxiety,^{2,7} and correlates with the severity of depressive episodes.⁸ Anger is also a frequent problem in individuals with post-traumatic stress disorder (PTSD).^{9, 10} The prevalence of anger is also elevated among individuals with panic disorder, agoraphobia, cluster B and C personality disorders,¹¹ and among individuals who use tobacco, alcohol, or illegal substances.¹²⁻¹⁴

Anger has also been linked to several sociodemographic characteristics. Inverse associations exist between age, socioeconomic status and anger.¹⁵ Aggression, which might be triggered by anger,¹⁶ appears to be more common among younger individuals, who are more likely to be perpetrators and victims of violence than other age groups.¹⁷ Whether a similar pattern exists for anger in the general population is not known. A greater understanding of the epidemiology of anger might help inform public health education and clinical efforts aimed at reducing or preventing poorly controlled anger. In the following analysis of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) survey results, a nationally representative sample of the adult population of the United States, we assess the prevalence as well as the sociodemographic and clinical correlates of anger in the general population and characterize adults that report inappropriate, intense, or poorly controlled anger.

Methods

Sample

Study subjects were drawn from wave 2 of the NESARC (2004-2005) which has been described in detail elsewhere.¹⁸ The target population of the NESARC was the civilian noninstitutionalized population 18 years and older residing in households and group quarters. Blacks, Hispanics, and adults 18-24 were oversampled, with data adjusted for oversampling, household- and person-level non-response.¹⁹ The fieldwork for this survey was completed under NIAAA's direction by trained U.S. Census Bureau Field Representatives. Data were collected through computer-assisted personal interviews (CAPI) in face-to-face household settings. All potential NESARC respondents were informed in writing about the nature of the survey, the statistical uses of the survey data, the voluntary aspect of their participation, and the Federal laws that rigorously provide for the confidentiality of identifiable survey information. Participants who completed the survey were given \$80.²⁰ The sample in wave 1 included 43,093 respondents ages 18 and older, representing the civilian, noninstitutionalized adult population in the United States, including all 50 States and the District of Columbia. Excluding respondents ineligible for the Wave 2 interview (e.g., deceased), the Wave 2 response rate was 86.7%, resulting in 34,653 completed interviews.

Assessment

All NESARC participants were asked three questions related to anger in Wave 2 of the NESARC. These questions were: 1) "Have even little things made you angry or have you had difficulty controlling your anger?" 2) "Have you often had temper outbursts or gotten so angry that you lose control?" and 3) "Have you hit people or thrown things when you got angry?" Cronbach's alpha for the items was 0.74, indicating good internal consistency.

Following each question, subjects were asked about the impact of their anger on their lives. Only individuals who answered affirmatively to the follow-up question "did this ever trouble you or cause problems at work or school, or with your family or other people?" were defined in this study as having inappropriate, intense, or poorly controlled anger. We also examined the association between each anger question and psychiatric disorders. Furthermore, to examine the severity of this type of anger, respondents were grouped into those who answered positively to one of the questions, those who answered positively to two questions, and those who answered positively to all three questions.

Sociodemographic measures included sex, race-ethnicity, nativity, age, education, marital status, and place of residence. Socioeconomic measures included employment status, and personal and family income measured as categorical variables. Using DSM-IV criteria, the presence of Axis I conditions was assessed by means of the diagnostic interview was the Alcohol Use Disorder and Associated Disabilities Interview Schedule – DSM-IV Version (AUDADIS-IV).²¹ This structured interview was designed for experienced lay interviewers. Extensive AUDADIS-IV questions covered DSM-IV criteria for alcohol and drug-specific abuse and dependence for 10 classes of substances. Mood disorders included DSM-IV primary major depressive disorder (MDD), bipolar I, and bipolar II disorder. Anxiety

disorders included DSM-IV primary panic disorder (with and without agoraphobia), social anxiety disorder and specific phobias, and generalized anxiety disorder (GAD). Diagnoses of attention-deficit/hyperactivity disorder (ADHD) and posttraumatic stress disorder (PTSD) were also assessed in wave 2. Conduct disorder and personality disorders assessed on a lifetime basis at wave 1 and described in detail elsewhere. The latter included avoidant, dependent, obsessive-compulsive, paranoid, schizoid, histrionic, and antisocial personality disorders. Borderline, schizotypal, and narcissistic personality disorders were measured at wave 2.²²

Test-retest reliabilities for AUDADIS-IV mood, anxiety, personality disorders, and ADHD diagnoses in the general population and clinical settings were fair to good ($\kappa=0.40-0.77$). Test-retest reliabilities of AUDADIS-IV personality disorders compare favorably with those obtained in patient samples using semistructured personality interviews. Convergent validity was good to excellent for all affective, anxiety, and personality disorder diagnoses, and selected diagnoses showed good agreement ($\kappa=0.64-0.68$) with psychiatrist reappraisals.²³

Non-diagnostic variables were also included in the analysis. The presence of a psychotic disorder was assessed by asking the respondent if a doctor or other health professional had told the respondent in the last 12 months he/she had schizophrenia or a psychotic disorder. We also included variables measuring any substance use, any alcohol use, and any tobacco use during the last 12 months. The reliability of the alcohol consumption and drug use measures has been documented to range from good to excellent.^{21, 24}

Life events and risk markers

The study further included life events and other variables hypothesized to correlate with anger.^{25, 26} These variables included adverse childhood events such as physical neglect, verbal and physical abuse, emotional neglect, and sexual abuse. All questions about adverse childhood events referred to the respondents' first 17 years of life. Questions were adapted from the Adverse Childhood Events study²⁷ and derived from the Conflict Tactics Scale²⁸ and the Childhood Trauma Questionnaire.²⁹

Respondents were also queried about parental factors, including parental history of mood, substance and alcohol use disorders, and antisocial personality disorder. Additionally, respondents were also queried on whether they had ever been sexually assaulted, molested, or raped; physically attacked or badly beaten up by their spouse or romantic partner or by somebody else; or if they had ever been married or lived with a person with alcoholism or problem drinking. Since these questions contained information on age at first occurrence and most recent occurrences, information was available of these events after age 18.

Other measures

Psychosocial functioning in the past month was assessed using subscales from the Short Form-12v2 (SF-12),³⁰ a reliable and valid measure of disability used in population surveys that includes the physical component summary and mental component summary. The SF-12 assesses respondents' abilities performing tasks or the degree to which physical or mental factors limit their activities. Each SF-12 disability scale yields a norm-based score with a mean of 50, a standardized range of 0–100, and a standard deviation (SD) of 10 for the U.S.

general population. Individual results above or below 50 indicate scores higher or lower than those of the general population, respectively. The reliability and validity of the SF-12 has been well documented in a wide range of samples including medical settings (e.g. myocardial infarction, chronic pain) and in the general population.³⁰

Statistical analyses

Weighted percentages, means and odds ratios (ORs) were computed to derive sociodemographic and clinical characteristics of respondents with and without a history of anger. Standard errors and 95% confidence intervals (CIs) for all analyses were estimated with SUDAAN,³¹ to adjust for the design effects of complex sample surveys such as the NESARC. Because the combined SE of two means (or percents) is always equal to or less than the sum of the standard errors of those two means, we conservatively consider that two CIs that do not overlap are significantly different from one another.³² We consider significant odds ratios those whose CI does not include 1. Two sets of logistic regressions examined associations between anger and lifetime comorbid psychiatric disorders adjusting for potential confounders. The first set adjusted only for sociodemographic characteristics that differed between individuals with and without a lifetime history of anger. The second set further adjusted for the presence of other comorbid psychiatric disorders to identify common and unique factors underlying the associations of comorbid disorders with anger.

Because only minor differences were found between the model that adjusted for sociodemographic characteristics and the model adjusted also for other comorbid disorders, results are shown for the unadjusted models and the model that adjusted for sociodemographic characteristics and comorbid psychiatric disorders. Results of the set adjusting only for sociodemographic characteristics are available upon request.

Findings

Sociodemographic and socioeconomic characteristics

The overall lifetime prevalence of anger in the general population was estimated to be 7.81%. The odds of anger were significantly higher in men than in women. The odds of anger were significantly lower in Asians than Whites. On the other hand, Native Americans had higher odds of anger than Whites. The odds of anger were lower for individuals who were foreign-born, older than 45 years, or had individual or family incomes greater than \$20,000 and \$35,000 respectively. The odds of anger were significantly higher in individuals who were widowed, separated, divorced, or never married, as well as those who were unemployed (Table 1).

Life events and risk markers

The odds of all childhood adverse events, parental factors and adulthood adverse events were significantly higher among individuals with anger. Physical abuse and neglect, having a parental history of behavioral problems, and having been physically attacked or badly beaten by a spouse or romantic partner after age 18 were correlated with the greater odds of anger (Table 2).

Psychiatric disorders and psychosocial functioning

A significantly larger percentage of individuals with (87.16%) than without (39.55%) anger met criteria for at least one psychiatric disorder in the past 12 months. The odds of all Axis I disorders were significantly higher in individuals with anger than in individuals without anger (Table 3).

Among Axis I disorders, the highest ORs were for bipolar disorder, drug dependence and psychotic disorder. The odds of all personality disorders were also significantly higher in individuals with anger. Among personality disorders, the highest ORs were for borderline, schizotypal, narcissistic and dependent personality disorder. Individuals with anger were significantly more likely than individuals without anger to use drugs, alcohol, and tobacco.

Anger was significantly associated with lower mental and physical component summary scores in the SF-12.

Logistic regressions adjusting for sociodemographic characteristics and Axis I and II disorders

After adjusting for sociodemographic characteristics and the presence of comorbid Axis I and II disorders, the odds of Axis I disorders among individuals with anger remained significant except for nicotine dependence, alcohol abuse, drug use disorders, dysthymia, panic disorder, and social anxiety disorder which no longer significantly differed between the groups. The odds of having schizotypal, narcissistic, borderline, and histrionic personality disorder remained significantly higher while dependent and schizoid personality disorders became significantly lower in individuals with anger. The odds of using tobacco in the past 12 months also became significantly lower in individuals without anger.

Prevalence of psychiatric disorders by question and anger severity

The prevalence of “anger that was difficult to control/brought up by little things” was 4.26%, the prevalence for “temper outburst/anger loss control” was 4.29 % and for “hitting people/throwing things when angry” was 4.35 %. Across all respondents, 4.17% of answered positively to 1 anger question, 2.17% to 2 anger questions, and 1.46% to all 3 questions.

Answering positively to any of the three questions was significantly associated with personality, mood, anxiety, or substance use disorders (Table 4). Responding positively to the question on temper outbursts and loss of control was associated with the greatest odds of having any mood, anxiety, and personality disorder. There was a dose response relationship, with the odds for any of the psychiatric disorders increasing with the number of positively answered anger questions. The highest odds when answering positively to the three questions was for personality disorders followed by mood and anxiety disorders.

Discussion

A history of inappropriate, intense, or poorly controlled anger that interferes with work, school, or social relations is found in roughly one in thirteen US adults. This type of anger was especially common among men and younger adults, and was associated with high rates

of childhood adverse events, a wide range of current psychiatric disorders, and diminished psychosocial functioning.

Men were more likely than women to report anger. Our findings on higher rates of anger in men parallel those of studies showing gender differences in aggression in the community.³³ Higher social permissiveness towards aggressive behavior in men may also contribute to increased rates of expression of anger in men.³⁴ Studies on gender differences in emotion expression suggest that males tend to express more externalizing emotions such as anger and that the modulation of these expressions during childhood facilitates the development of assertiveness, persistence, and self-efficacy.³⁵ At the same time however, a greater tendency to express externalizing emotions instead of other emotions such as fear might contribute to males' greater risk for conduct problems.³⁵ Our study also found ethnic differences in the prevalence of anger. This is consistent with a meta-analysis that found cultural differences in anger recognition,³⁶ suggesting that although emotions are likely universal, the process of learning to control both their expression and perception is highly dependent on cultural factors and specific values about emotion and emotion control.³⁷

Anger was inversely related to age. With age, adults consistently report less negative affective emotions.³⁸ Older adults are less likely to experience anger and, when they do so, it is usually experienced with a lower intensity.³⁹ Older adults may be more effective at regulating emotions and therefore experience fewer and less enduring negative emotions, managing and focusing on their emotions better than young adults and adolescents.⁴⁰ Older adults can draw on accumulated experiences and use a larger repertoire of strategies when encountering emotionally charged problems. In relation to younger adults, older adults may more commonly rely on passive emotion-focused strategies such as avoidance and passive-dependence, which may help maintain less activated levels of arousal.⁴¹

Anger was strongly associated with a broad range of life events, especially a history of childhood physical abuse and neglect. Childhood traumatic events that pose an actual or perceived threat can activate extreme stress responses.^{42, 43} Brief increases in cortisol during stress initially increase alertness, activity levels, and feelings of wellbeing. However, prolonged elevations stimulate withdrawal, dysphoria and feelings of tiredness. Persistent activation of stress response systems, greater intensity and prolonged traumatic events appear to induce changes in arousal systems and to be linked to the release endogenous opioids and the predisposition to emotional dysregulation.⁴⁴ The widely documented association between psychiatric disorders and childhood trauma may also help explain the high rates of anger in these individuals.^{25, 45-48} In addition to links between adverse childhood events and anger, adulthood adversities such as having been married or having lived with a partner with an alcohol use disorder were also strongly associated with inappropriate, intense, or poorly controlled anger.

Inappropriate, intense, or poorly controlled anger was associated with a wide range of psychiatric disorders. Borderline personality disorder, with its characteristic and persistent disturbance in impulse control, affect regulation and interpersonal relations, was the most strongly associated with anger. Anger was also strongly related to all other assessed

personality disorders. It was also highly prevalent among individuals with bipolar disorder, a disorder marked by affective instability, impulsivity and interpersonal problems.

Considering the cross-sectional design and retrospective nature of studies of this kind, this assessment does not permit causal inferences. It is therefore, also possible that individuals with psychiatric disorders experience several adverse psychosocial consequences that predispose them to inappropriate, intense, or poorly controlled anger. Adults with psychiatric disorders are often socially isolated due to personal attributes, such as fear of victimization, odd behavior, and underdeveloped social skills. Larger societal forces including stigma and negative stereotyping may compound social isolation⁴⁹ and prompt anger. Lack of social skills, higher rates of unemployment, and other disadvantages may further reduce opportunities of individuals with psychiatric disorders to engage in reciprocal social activities. Hostility may sometimes be a response from negative interpersonal experiences but also lead to negative responses in future social interactions. Hostile cognitions can lead individuals to experience and generate interpersonal stressors with self-perpetuating cycles in which hostile thoughts are confirmed and reinforced through ongoing negative interpersonal interactions.

Inappropriate, intense, or poorly controlled anger could also be a consequence of the neurobiologic abnormalities underpinning particular disorders. This type of anger may serve as an indicator or the expression of frontolimbic dysfunction commonly found in several psychiatric disorders.^{50, 51} Developmental alterations in prefrontal-subcortical circuitry as well as neuromodulator abnormalities may play an etiologic role. Imbalances between limbic impulses and prefrontal control mechanisms appear important in a range of psychiatric pathology provoked by negative stimulation, including externally directed aggression as well as withdrawal behaviors associated with borderline personality disorders, antisocial subjects, PTSD, and mood disorders.⁵²⁻⁵⁴

A dose-response relationship appears to exist between extent of anger and risk for a broad range of psychopathology. Whereas mild forms may present in larger segments of the population, more severe forms of anger appear to be especially strongly associated with psychiatric disorders. Alternatively, higher levels of anger may represent a marker of risk for these disorders. A small proportion of individuals with anger problems receive treatment specifically for their anger.⁵⁵ As evidenced by our study, the vast majority of individuals with anger have a current psychiatric disorder, which could increase the complexity of cases presenting to treatment. Although anger appears more common than many psychiatric symptoms commonly explored by clinicians, it might often go undetected. By assessing anger problems, clinicians may be able to increase recognition and treatment of psychiatric disorders and to improve their protracted course and management. Meta-analysis supports the implementation of cognitive therapies to target anger specifically⁵⁵ and other studies show that early improvement in symptoms of anger predicts response and remission in individuals with major depression, suggesting that monitoring of anger symptoms could help guide treatment.⁵⁶ For example, in a recent study of 676 veterans who served in Iraq and Afghanistan, difficulties managing anger were associated with post-deployment PTSD hyperarousal symptoms.⁵⁷ These results suggested that assessment of risk factors for anger in veterans may identify those at risk of problematic postdeployment adjustment.

Our study has several limitations. First, information on anger was based on self-report and not confirmed by collateral informants, leading to possible misclassification. Second, because the NESARC sample only included persons in civilian households and those in group quarters who were 18 years and older, information was unavailable on adolescents or individuals in prison who may have a higher prevalence of anger. The unique issues and needs of these groups might differ from those of general population adults. Given the importance of this problem, this calls for appropriate investigations of these excluded groups in other studies. Third, to minimize subject burden, the assessment of anger was based on three questions from the AUDADIS-IV, rather than using longer, more clinically-based scales or better validated psychological assessments of anger.^{58, 59}

Nonetheless, the three items showed good internal consistency. Even with this broad definition, the results of the study suggest that anger that was reported as “troubling or causing them problems at work or school, with their family or other people” is strongly associated with high rates of psychopathology supporting not only its face validity but its clinical relevance. Fourth, participants may have underreported anger, due to concerns of social desirability. However, previous studies with the NESARC have reported even higher rates of other socially undesirable attributes such as shoplifting⁶⁰ or firesetting,⁶¹ domestic violence, and commission of illegal acts⁶²⁻⁶⁴ suggesting that underreporting of anger, if present, is unlikely to be substantial. Despite these limitations, the NESARC provides detailed nationally representative survey data on anger and its correlates.

Conclusions

Anger is relatively common and is associated with high rates of psychopathology, lifetime history of traumatic events, and psychosocial impairment. As we move to a better scientific understanding of its prevalence and distribution in the population, the development of effective screening tools and early intervention strategies for individuals with anger may benefit a large segment of the general population, especially young adults.

Acknowledgements

None

References

1. Smith, TW. Concepts and methods in the study of anger, hostility and health. In: Siegman, AW.; Smith, TW., editors. Anger, hostility and the heart (pp. 23-42). Lawrence Erlbaum; Hillsdale, NJ: 1994.
2. Posternak MA, Zimmerman M. Anger and aggression in psychiatric outpatients. *J Clin Psychiatry*. 2002; 63(8):665–672. [PubMed: 12197446]
3. Frasure-Smith N, Lespérance F. Depression and other psychological risks following myocardial infarction. *Arch Gen Psychiatry*. 2003; 60(6):627–636. [PubMed: 12796226]
4. Kassonov H, Sukhodolsky DG. Anger disorders: Basic science and practice issues. *Issues Compr Pediatr Nurs*. 1995; 18(3):173–205. [PubMed: 8707651]
5. Maneta E, Cohen S, Schulz M, et al. Links between childhood physical abuse and intimate partner aggression: The mediating role of anger expression. *Violence Vict*. 2012; 27(3):315–328. [PubMed: 22852434]

6. Swogger MT, Walsh Z, Homaifar BY, et al. Predicting self- and other-directed violence among discharged psychiatric patients: the roles of anger and psychopathic traits. *Psychol Med*. 2011; 18:1–9.
7. Dougherty DD, Rauch SL, Deckersbach T, et al. Ventromedial prefrontal cortex and amygdala dysfunction during an anger induction positron emission tomography study in patients with major depressive disorder with anger attacks. *Arch Gen Psychiatry*. 2004; 61(8):795–804. [PubMed: 15289278]
8. Fraguas R Jr, Papakostas GI, Mischoulon D, et al. Anger attacks in major depressive disorder and serum levels of homocysteine. *Biol Psychiatry*. 2006; 60(3):270–274. [PubMed: 16325154]
9. Chemtob CM, Novaco RW, Hamada RS, et al. Anger regulation deficits in combat-related posttraumatic stress disorder. *J Trauma Stress*. 1997; 10(1):17–36. [PubMed: 9018675]
10. Feeny NC, Zoellner LA, Foa EB. Anger, dissociation, and posttraumatic stress disorder among female assault victims. *J Trauma Stress*. 2000; 13(1):89–100. [PubMed: 10761176]
11. Gould RA, Ball S, Kaspi SP, et al. Prevalence and correlates of anger attacks: a two site study. *J Affect Disord*. 1996; 39(1):31–38. [PubMed: 8835651]
12. Litt MD, Cooney NL, Morse P. Reactivity to alcohol related stimuli in the laboratory and in the field: predictors of craving in treated alcoholics. *Addiction*. 2000; 95(6):889–900. [PubMed: 10946438]
13. Goldstein RZ, Alia-Klein N, Leskovjan AC, et al. Anger and depression in cocaine addiction: association with the orbitofrontal cortex. *Psychiatry Res*. 2005; 138(1):13–22. [PubMed: 15708297]
14. Patterson F, Kerrin K, Wileyto EP, et al. Increase in anger symptoms after smoking cessation predicts relapse. *Drug Alcohol Depend*. 2008; 95(1-2):173–176. [PubMed: 18328642]
15. Schieman S. Socioeconomic status and the frequency of anger across the life course. *Sociol Perspect*. 2003; 46(2):207–222.
16. Alia-Klein N, Goldstein RZ, Tomasi D, et al. Neural mechanisms of anger regulation as a function of genetic risk for violence. *Emotion*. 2009; 9(3):385–396. [PubMed: 19485616]
17. Truman JL, Rand MR. National Crime Victimization Survey Criminal Victimization, 2009. U.S. Department of Justice Office of Justice Programs Bureau of Justice Statistics. NCJ. 2010; 231327
18. Grant, BF.; Kaplan, KK.; Stinson, FS. Source and Accuracy Statement: The Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. National Institute on Alcohol Abuse and Alcoholism; Bethesda, MD: 2005.
19. Grant BF, Hasin DS, Stinson FS, et al. Prevalence, correlates, and disability of personality disorders in the United States: results for the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry*. 2004; 65(7):948–958. [PubMed: 15291684]
20. U.S. Department of Health and Human Services. Data Catalog Contract No. 233-02-0087. Westat, Rockville, MD: 2006. Data on health and well-being of American Indians, Alaska Natives, and other Native Americans. available at <http://aspe.hhs.gov/hsp/06/Catalog-AI-AN-NA/>
21. Grant BF, Dawson DA, Stinson FS, et al. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. *Drug Alcohol Depend*. 2003; 71(1):7–16. [PubMed: 12821201]
22. Ruan WJ, Goldstein RB, Chou SP, et al. The alcohol use disorder and associated disabilities interview schedule-IV (AUDADIS-IV): reliability of new psychiatric diagnostic modules and risk factors in a general population sample. *Drug Alcohol Depend*. 2008; 92(1-3):27–36. [PubMed: 17706375]
23. Cottler LB, Grant BF, Blaine J, et al. Concordance of DSM-IV alcohol and drug use disorder criteria and diagnoses as measured by AUDADIS-ADR, CIDI and SCAN. *Drug Alcohol Depend*. 1997; 47(3):195–205. [PubMed: 9306045]
24. Hasin D, Carpenter KM, McCloud S, et al. The alcohol use disorder and associated disabilities interview schedule (AUDADIS): reliability of alcohol and drug modules in a clinical sample. *Drug Alcohol Depend*. 1997; 44(2-3):133–141. [PubMed: 9088785]

25. Dong M, Giles WH, Felitti VJ, et al. Insights into causal pathways for ischemic heart disease: adverse childhood experiences study. *Circulation*. 2004; 110(13):1761–1766. [PubMed: 15381652]
26. Midei AJ, Matthews KA, Bromberger JT. Childhood abuse is associated with adiposity in midlife women: possible pathways through trait anger and reproductive hormones. *Psychosom Med*. 2010; 72(2):215–223. [PubMed: 20064904]
27. Dube SR, Felitti VJ, Dong M, et al. Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the adverse childhood experiences study. *Pediatrics*. 2003; 111(3):564–572. [PubMed: 12612237]
28. Straus M. Measuring intrafamily conflict and violence: the conflict tactics (CT) scales. *J Marriage Fam*. 1979; 41:75–88.
29. Bernstein DP, Fink L, Handelsman L, et al. Initial reliability and validity of a new retrospective measure of child abuse and neglect. *Am J Psychiatry*. 1994; 151(8):1132–1136. [PubMed: 8037246]
30. Ware, JE.; Kosinski, M.; Turner-Bowker, DM., et al. How to Score Version 2 of the SF-12 Health Survey. Quality Metrics; Lincoln, RI: 2002.
31. Research Triangle Institute. Software for Survey Data Analysis (SUDAAN). Version 9.0. Research Triangle Institute; NY: 2004.
32. Agresti, A. Categorical Data Analysis. 2nd ed. John Wiley and Sons; Hoboken, NJ: 2002.
33. Eaton DK, Kann L, Kinchen S, et al. Youth risk behavior surveillance - United States, 2011. *MMWR Surveill Summ*. 2012; 61(4):1–162. [PubMed: 22673000]
34. Potegal M, Archer J. Sex differences in childhood anger and aggression. *Child Adolesc Psychiatr Clinics N Am*. 2004; 13(3):513–528.
35. Chaplin TM, Aldao A. Gender differences in emotion expression in children: a meta-analytic review. *Psychol Bull*. 2003; 139(4):735–765. [PubMed: 23231534]
36. Elfenbein HA, Ambady N. On the universality and cultural specificity of emotion recognition: a meta-analysis. *Psychol Bull*. 2002; 128(2):203–235. [PubMed: 11931516]
37. Mauss IB, Butler EA, Roberts NA, et al. Emotion control values and responding to an anger provocation in Asian-American and European-American individuals. *Cogn Emot*. 2010; 24(6): 1026–1043. [PubMed: 21116444]
38. Charles ST, Reynolds CA, Gatz M. Age-related differences and change in positive and negative affect over 23 years. *J Pers Soc Psychol*. 2001; 80(1):136–151. [PubMed: 11195886]
39. Schieman S. Age and anger. *J Health Soc Behav*. 1999; 40(3):273–289. [PubMed: 10513148]
40. Brassens S, Gamer M, Peters J, et al. Don't look back in anger! Responsiveness to missed chances in successful and unsuccessful aging. *Science*. 2012; 336(6081):612–614. [PubMed: 22517323]
41. Blanchard-Fields F, Mienaltowski A, Seay RB. Age differences in everyday problem-solving effectiveness: older adults select more effective strategies for interpersonal problems. *J Gerontol B Psychol Sci Soc Sci*. 2007; 62(1):61–64.
42. Ouellet-Morin I, Danese A, Bowes L, et al. A discordant monozygotic twin design shows blunted cortisol reactivity among bullied children. *J Am Acad Child Adolesc Psychiatry*. 2011; 50(6):574–582. [PubMed: 21621141]
43. Heim C, Newport DJ, Heit S, et al. Pituitary-adrenal and autonomic responses to stress in women after sexual and physical abuse in childhood. *JAMA*. 2000; 284(5):592–597. [PubMed: 10918705]
44. Kennedy SE, Koeppe RA, Young EA, et al. Dysregulation of endogenous opioid emotion regulation circuitry in major depression in women. *Arch Gen Psychiatry*. 2006; 63(11):1199–1208. [PubMed: 17088500]
45. Herrenkohl TI, Klika JB, Herrenkohl RC, et al. A prospective investigation of the relationship between child maltreatment and indicators of adult psychological well-being. *Violence Vict*. 2012; 27(5):764–776. [PubMed: 23155725]
46. Hasler R, Perroud N, Baud P, et al. CREB1 modulates the influence of childhood sexual abuse on adult's anger traits. *Genes Brain Behav*. 2012; 11(6):720–726. [PubMed: 22574704]
47. Sugaya L, Hasin DS, Olfson M, et al. Child physical abuse and adult mental health: A national study. *J Trauma Stress*. 2012; 25(4):384–392. [PubMed: 22806701]

48. Pérez-Fuentes G, Olfson M, Villegas L, et al. Prevalence and correlates of child sexual abuse: a national study. *Compr Psychiatry*. 2013; 54(1):16–27. [PubMed: 22854279]
49. Ware NC, Hopper K, Tugenberg T, et al. Connectedness and citizenship: redefining social integration. *Psychiatr Serv*. 2007; 58(4):469–474. [PubMed: 17412847]
50. Tromp DP, Grupe DW, Oathes DJ, et al. Reduced structural connectivity of a major frontolimbic pathway in generalized anxiety disorder. *Arch Gen Psychiatry*. 2012; 69(9):925–934. [PubMed: 22945621]
51. Minzenberg MJ, Fan J, New AS, et al. Fronto-limbic dysfunction in response to facial emotion in borderline personality disorder: An event-related fMRI study. *Psychiatry Res*. 2007; 155(3):231–243. [PubMed: 17601709]
52. Matsuo K, Glahn DC, Peluso MA, et al. Prefrontal hyperactivation during working memory task in untreated individuals with major depressive disorder. *Mol Psychiatry*. 2007; 12(2):158–166. [PubMed: 16983390]
53. Thomaes K, Dorrepaal E, Draijer N, et al. Reduced anterior cingulate and orbitofrontal volumes in child abuse-related complex PTSD. *J Clin Psychiatry*. 2010; 71(12):1636–1644. [PubMed: 20673548]
54. Hazlett EA, New AS, Newmark R, et al. Reduced anterior and posterior cingulate gray matter in borderline personality disorder. *Biol Psychiatry*. 2005; 58(8):614–623. [PubMed: 15993861]
55. Vecchio TD, O’Leary KD. Effectiveness of anger treatments for specific anger problems: a meta-analytic review. *Clin Psychol Rev*. 2004; 24(1):15–34. [PubMed: 14992805]
56. Farabaugh A, Sonawalla S, Johnson DP, et al. Early improvements in anxiety, depression, and anger/hostility symptoms and response to antidepressant treatment. *Ann Clin Psychiatry*. 2010; 22(3):166–171. [PubMed: 20680189]
57. Elbogen EB, Wagner HR, Fuller SR, et al. Correlates of anger and hostility in Iraq and Afghanistan war veterans. *Am J Psychiatry*. 2010; 167(9):1051–1058. [PubMed: 20551162]
58. Novaco, RW. *The Novaco Anger Scale and Provocation Inventory*. Western Psychological Services; Los Angeles, CA: 2003.
59. Spielberger, CD. *State-trait Anger Expression Inventory-2 (STAXI-2)*. Psychological Assessment Resources; Odessa, FL: 1999.
60. Blanco C, Grant J, Petry NM, et al. Prevalence and correlates of shoplifting in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *Am J Psychiatry*. 2008; 165(7):905–913. [PubMed: 18381900]
61. Blanco C, Alegria A, Petry NM, et al. Prevalence and correlates of firesetting in the US: results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *J Clin Psychiatry*. 2010; 71(9):1218–1225. [PubMed: 20361899]
62. Alegria AA, Blanco C, Petry NM, et al. Sex differences in antisocial personality disorder: results from the National Epidemiological Survey on Alcohol and Related Conditions. *Personal Disord*. 2013; 4(3):214–222. [PubMed: 23544428]
63. Okuda M, Olfson M, Hasin D, et al. Mental health of victims of intimate partner violence: results from a national epidemiologic survey. *Psychiatr Serv*. 2011; 62(8):959–962. [PubMed: 21807838]
64. Goldstein RB, Grant BF. Three-year follow-up of syndromal antisocial behavior in adults: results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry*. 2009; 70(9):1237–1249. [PubMed: 19538901]

Table 1

Sociodemographic characteristics of individuals with and without anger in the National Epidemiologic Survey on Alcohol and Related Conditions

Characteristic	Anger (n=2,738)			No Anger (n=31,704) ^a			OR	95% CI	
	%	95%	CI	%	95%	CI		OR	95% CI
Overall Prevalence	7.81% (7.41-8.22)			92.19% (91.78-92.59)					
Sex									
Men	52.26	50.14	54.38	47.57	46.86	48.28	1.21	1.11	1.32
Women ^a	47.74	45.62	49.86	52.43	51.72	53.14	1.00	1.00	1.00
Race/ethnicity									
White ^a	72.76	69.32	75.95	70.82	67.64	73.81	1.00	1.00	1.00
Black	11.05	9.46	12.87	11.04	9.76	12.45	0.97	0.85	1.11
Asian	2.46	1.65	3.66	4.37	3.44	5.55	0.55	0.39	0.78
Native American	3.04	2.25	4.10	2.11	1.78	2.50	1.40	1.02	1.93
Hispanic	10.69	8.46	13.41	11.66	9.46	14.28	0.89	0.78	1.02
Nativity									
Born in the United States ^a	92.00	89.67	93.84	85.76	82.75	88.32	1.00	1.00	1.00
Born outside United States	8.00	6.16	10.33	14.24	11.68	17.25	0.52	0.45	0.61
Age									
18-29 ^a	22.23	20.32	24.27	15.91	15.24	16.59	1.00	1.00	1.00
30-44	36.15	33.85	38.53	29.19	28.42	29.96	0.89	0.76	1.03
45-64	33.43	31.34	35.58	34.72	34.04	35.42	0.69	0.60	0.79
65+	8.19	6.99	9.57	20.18	19.47	20.92	0.29	0.24	0.35
Marital Status									
Married or cohabiting ^a	57.80	55.48	60.08	64.35	63.35	65.34	1.00	1.00	1.00
Widowed/separated/divorced	20.66	19.06	22.35	18.65	18.12	19.19	1.23	1.10	1.38
Never married	21.54	19.72	23.49	17.00	16.06	17.98	1.41	1.23	1.61
Education									
Less than High school	14.66	12.98	16.51	13.91	13.04	14.82	1.05	0.91	1.19
High school graduate	22.61	20.49	24.87	23.90	22.99	24.83	0.94	0.83	1.06
Some college or higher ^a	62.74	60.21	65.19	62.20	61.05	63.32	1.00	1.00	1.00
Individual Income									
0-19,000 ^a	48.57	45.98	51.18	41.60	40.47	42.73	1.00	1.00	1.00
20,000-34,000	22.62	20.78	24.58	23.15	22.42	23.89	0.84	0.73	0.95
35,000-69,000	21.57	19.72	23.55	24.57	23.79	25.36	0.75	0.66	0.86
>70,000	7.23	5.92	8.82	10.69	9.83	11.61	0.58	0.47	0.71
Family Income									
0-19,000 ^a	24.05	21.96	26.29	19.13	18.20	20.09	1.00	1.00	1.00
20,000-34,000	20.58	18.67	22.64	18.70	18.01	19.42	0.88	0.75	1.02
35,000-69,000	31.24	29.19	33.37	32.37	31.57	33.19	0.77	0.67	0.87

Characteristic	Anger (n=2,738)			No Anger (n=31,704) ^a			OR	95% CI	
	%	95%	CI	%	95%	CI			
Overall Prevalence	7.81% (7.41-8.22)			92.19% (91.78-92.59)					
>70,000	24.13	21.84	26.57	29.80	28.33	31.31	0.64	0.55	0.75
Employment Status									
Employed ^a	62.89	60.57	65.15	65.34	64.51	66.16	1.00	1.00	1.00
Unemployed	37.11	34.85	39.43	34.66	33.84	35.49	1.11	1.01	1.23
Urbanicity									
Rural	16.13	14.17	18.30	16.32	15.26	17.44	0.99	0.86	1.13
Urban ^a	83.87	81.70	85.83	83.68	82.56	84.74	1.00	1.00	1.00

^aReference group.

OR= odds ratio, CI= confidence interval.

Table 2

Life events and risk markers of individuals with and without anger

	Anger (n=2,738)			No Anger (n=31,704) ^a		
	%	95% CI	%	95% CI	OR	95% CI
Childhood Adverse Events						
Physical neglect/abuse	27.41	25.48 29.42	9.10	8.66 9.56	3.77	3.37 4.23
Verbal abuse/emotional neglect	44.91	42.50 47.34	20.37	19.74 21.02	3.19	2.87 3.53
Sexual abuse	25.41	23.37 27.57	8.96	8.48 9.47	3.46	3.07 3.90
Parental factors						
Parent with lifetime mood disorder	37.65	35.08 40.29	21.31	20.38 22.26	2.23	2.01 2.48
Parent with lifetime alcohol/drug problem	37.24	34.71 39.84	21.57	20.76 22.41	2.16	1.95 2.39
Parent with lifetime behavioral problem	20.52	18.55 22.65	7.23	6.73 7.76	3.31	2.87 3.83
Adulthood adverse events (after age 18)						
Ever sexually assaulted/molested/raped	9.58	8.10 11.30	2.57	2.35 2.81	4.02	3.27 4.93
Ever physically attacked/badly beaten up by somebody else	13.40	12.04 14.88	3.92	3.64 4.22	3.79	3.28 4.38
Ever physically attacked/badly beaten up by spouse/romantic partner	17.07	15.28 19.02	4.85	4.52 5.19	4.04	3.49 4.68
Ever married/lived with an alcoholic or problem drinker	28.98	26.80 31.27	14.53	13.91 15.17	2.40	2.15 2.69

^aReference group.

OR=odds ratio, CI= confidence interval.

Table 3

Past 12-month psychiatric comorbidity, overall health, substance use, and level of disability for individuals with or without anger

	Anger (N=2,738)		No Anger (N=31,704) ^a		OR	95% CI	AOR ^b	95% CI		
	%	SE	%	SE						
Any psychiatric diagnosis	87.16	0.83	39.55	0.49	10.37	8.96	12.01	9.01	7.81	10.41
Any Axis I disorder	72.23	1.16	31.63	0.47	5.62	5.06	6.25	2.64	2.33	2.98
Any substance use disorder	43.67	1.20	19.35	0.44	3.23	2.94	3.55	1.46	1.29	1.66
Nicotine Dependence	29.58	1.16	12.63	0.35	2.91	2.60	3.25	1.10	0.94	1.28
Any alcohol use disorder	21.54	0.89	8.69	0.25	2.89	2.59	3.22	1.37	1.18	1.60
Alcohol abuse	7.42	0.59	5.11	0.19	1.49	1.24	1.79	1.22	0.97	1.53
Alcohol dependence	14.11	0.72	3.58	0.14	4.43	3.87	5.06	1.66	1.37	2.01
Any drug use disorder	9.19	0.67	1.83	0.10	5.44	4.53	6.54	1.28	0.96	1.69
Drug abuse	5.72	0.53	1.37	0.09	4.37	3.48	5.49	1.30	0.93	1.81
Drug dependence	4.32	0.46	0.52	0.06	8.67	6.34	11.85	1.38	0.89	2.15
Any Mood Disorder	34.82	1.05	7.52	0.21	6.57	5.92	7.29	1.83	1.58	2.12
Major depressive disorder	14.52	0.75	4.93	0.15	3.27	2.88	3.73	1.48	1.22	1.79
Dysthymia	1.95	0.29	0.66	0.06	2.98	2.14	4.17	0.66	0.37	1.21
Bipolar disorder	19.71	0.95	2.34	0.12	10.24	8.72	12.03	2.37	1.89	2.98
Any anxiety disorder	46.01	1.24	13.83	0.27	5.31	4.78	5.90	1.88	1.62	2.18
Panic disorder	9.94	0.73	1.96	0.10	5.52	4.53	6.73	0.96	0.69	1.34
Social anxiety disorder	11.20	0.82	1.82	0.09	6.82	5.71	8.14	1.09	0.81	1.46
Specific phobia	19.18	0.91	6.56	0.19	3.38	3.00	3.82	1.23	1.04	1.46
Generalized anxiety disorder	15.67	0.88	2.79	0.13	6.47	5.52	7.59	1.38	1.09	1.75
Posttraumatic stress disorder	23.30	1.01	5.12	0.15	5.63	4.95	6.41	1.74	1.44	2.10
Psychotic disorder	3.39	0.42	0.39	0.04	8.99	6.36	12.71	1.77	1.06	2.95
Any personality disorder^c	73.46	1.11	17.18	0.35	13.35	11.79	15.10	7.22	6.30	8.27
Avoidant	9.49	0.74	1.71	0.10	6.01	4.93	7.32	0.81	0.60	1.09
Dependant	2.12	0.35	0.28	0.04	7.71	5.26	11.31	0.53	0.30	0.96
Obsessive-compulsive	20.53	1.02	7.04	0.21	3.41	3.00	3.89	0.97	0.82	1.15
Paranoid	15.93	0.94	3.35	0.14	5.46	4.70	6.35	0.88	0.70	1.09

	Anger (N=2,738)		No Anger (N=31,704) ^a		OR	95% CI	AOR ^b	95% CI	p-value	
	%	SE	%	SE						
Schizoid	9.19	0.70	2.55	0.12	3.87	3.20	4.68	0.64	0.49	0.84
Schizotypal	26.01	1.09	2.08	0.11	16.55	14.34	19.12	5.40	4.50	6.49
Narcissistic	30.25	1.15	4.18	0.16	9.95	8.82	11.23	5.01	4.31	5.82
Borderline	50.06	1.20	2.18	0.11	45.07	39.59	51.32	22.68	19.62	26.23
Histrionic	8.38	0.69	1.25	0.08	7.23	5.85	8.92	1.31	1.01	1.72
Antisocial	14.04	0.82	2.99	0.15	5.31	4.49	6.27	1.13	0.90	1.43
ADHD^c	11.11	0.78	1.79	0.10	6.85	5.65	8.30	2.06	1.61	2.65
Conduct disorder^c	1.72	0.29	0.98	0.08	1.77	1.23	2.54	0.88	0.59	1.33
Any Substance Use	82.26	0.91	71.30	0.62	1.87	1.65	2.11	0.88	0.76	1.02
Any Tobacco Use	39.33	1.31	22.91	0.50	2.18	1.98	2.41	0.57	0.50	0.66
Any Alcohol use	73.39	1.04	65.70	0.66	1.44	1.30	1.60	0.97	0.86	1.10
Any Drug Use	18.96	0.95	5.99	0.18	3.67	3.25	4.15	0.97	0.80	1.16
SF-12^d	Mean	95% CI	Mean	95% CI	T-score	95% CI	T-score			
Physical component summary	48.43	47.82	49.03	50.43	50.21	50.64	-6.98			<0.0001
Mental component summary	44.36	43.78	44.95	52.03	51.87	52.20	-26.01			<0.0001

^a Reference group.

^b Adjusted by sociodemographic characteristics and Axis I and II comorbidity. Additional odds ratios (OR) estimated in logistic regressions adjusting only for sociodemographic characteristics are available on request (see text in Methods section).

^c Assessed on a lifetime basis.

^d Assessed during the last month.

OR=odds ratio, AOR=adjusted odds ratio, CI= confidence interval, SF-12=Short Form 12v2.

Table 4

Twelve-month prevalence of psychiatric disorders by anger severity

	Prevalence		Any mood disorder (n=3,534)		Any anxiety disorder (n=5,517)		Any substance use disorder (n=6,905)		Any personality disorder ^b (n=7,783)					
	%	(95% CI)	OR ^a	95% CI	OR ^a	95% CI	OR ^a	95% CI	OR ^a	95% CI				
Little things make you														
angry/difficulty controlling anger	4.26	(3.96-4.57)	7.20	6.32	8.21	5.83	5.11	6.67	3.28	2.90	3.71	15.97	13.51	18.87
Temper outburst/lose control	4.29	(4.02-4.56)	8.01	7.06	9.09	6.68	5.86	7.61	3.54	3.13	4.00	18.87	15.90	22.38
Hit people/thrown things when angry	4.35	(4.07-4.65)	5.97	5.24	6.79	4.74	4.12	5.44	3.48	3.11	3.89	11.91	10.20	13.91
Positive for only 1 question	4.17	(3.90-4.46)	4.76	4.11	5.53	3.64	3.16	4.20	2.72	2.39	3.09	8.91	7.71	10.29
Positive for 2 questions	2.17	(1.98-2.37)	7.15	5.85	8.72	6.28	5.21	7.57	3.25	2.71	3.89	18.18	14.36	23.02
Positive for 3 questions	1.46	(1.31-1.62)	13.09	10.74	15.95	9.81	7.81	12.33	5.18	4.18	6.42	41.81	30.17	57.95

^a Unadjusted ORs

^b Assessed on a lifetime basis

OR=odds ratio, CI= confidence interval.