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Antisocial Behavioral Syndromes and Three-Year Quality of Life Outcomes in United States Adults

Risë B. Goldstein, Ph.D., M.P.H.^a, Deborah A. Dawson, Ph.D.^{a,b}, Sharon M. Smith, Ph.D.^a, and Bridget F. Grant, Ph.D., Ph.D.^a

^aLaboratory of Epidemiology and Biometry, Division of Intramural Clinical and Biological Research, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, Bethesda, MD, USA

^bKelly Government Services Contractor

Abstract

Objective—To examine 3-year quality-of-life (QOL) outcomes among United States adults with *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV)* antisocial personality disorder (ASPD), syndromal adult antisocial behavior without conduct disorder (CD) before age 15 (AABS, not a DSM-IV diagnosis), or no antisocial behavioral syndrome at baseline.

Method—Face-to-face interviews (n= 34,653). Psychiatric disorders were assessed using the Alcohol Use Disorder and Associated Disabilities Interview Schedule – DSM-IV Version. Health-related QOL was assessed using the Short-Form 12-Item Health Survey, version 2 (SF-12 v2). Other outcomes included past-year Perceived Stress Scale-4 (PSS-4) scores, employment, receipt of Supplemental Security Income (SSI), welfare, and food stamps, and participation in social relationships.

Results—ASPD and AABS predicted poorer employment, financial dependency, social relationship, and physical health outcomes. Relationships of antisociality to SSI and food stamp receipt and physical health scales were modified by baseline age. Both antisocial syndromes predicted higher PSS-4, AABS predicted lower SF-12 v2 Vitality, and ASPD predicted lower SF-12 v2 Social Functioning scores in women.

Conclusion—Similar prediction of QOL by ASPD and AABS suggests limited utility of requiring CD before age 15 to diagnose ASPD. Findings underscore the need to improve prevention and treatment of antisocial syndromes.

Keywords

Antisocial personality disorder; quality of life; epidemiology; longitudinal course

Corresponding Author: Risë B. Goldstein, Ph.D., M.P.H., Laboratory of Epidemiology and Biometry, Room 3071, Division of Intramural Clinical and Biological Research, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, M.S. 9304, 5635 Fishers Lane, Bethesda, MD 20892-9304, Tel. 301-443-3528 Fax 301-443-1400, goldster@mail.nih.gov.

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Declaration of Interest:

Drs. Goldstein, Dawson, Smith, and Grant each report no financial interests to declare over the past 2 years.

Introduction

Antisocial personality disorder (ASPD) affects 3% to 5% of United States adults (1,2) and is associated with premature mortality (3,4) and a broad range of morbidity, including: poor health-related quality of life (QOL) (5,6); medical illnesses and injuries (5,7–11); mood (1,2,13,14), anxiety (1,2,14), substance use (15), and other personality disorders (PDs) (16); and suicidality (17). To our knowledge, there have been no rigorous trials of treatments targeting ASPD symptomatology other than criminality and aggression. In trials reporting criminality and aggression outcomes, patients were ascertained from correctional or addiction treatment settings or from outpatient clinics for impulsive aggression, not for ASPD per se (18,19). Naturalistic clinical studies of patients with ASPD have shown disappointing outcomes (20). Despite its poor response to treatment (20), however, both cross-sectional epidemiologic studies (21–23) and prospective clinical follow-ups (24,25) find that spontaneous improvement or remission of ASPD (reduction or cessation, respectively, of symptomatic behaviors) is common, typically beginning by the fifth decade.

Predictors of remission identified in clinical follow-ups of men with ASPD include increasing age and lower symptom severity at ascertainment, and absence of a current alcohol use disorder at follow-up (25–27). In the only prospective follow-up of a nationally representative sample (28), 52% of respondents to the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) who were diagnosed with ASPD at Wave 1 reported no symptomatic behaviors over the 3-year follow-up at Wave 2. Partially consistent with findings from clinical follow-ups (25,26), independent baseline predictors of persistent ASPD symptoms over follow-up included: male sex; age younger than 45; marital status other than married or cohabiting; comorbid lifetime drug use disorders, additional PDs, and attention-deficit/hyperactivity disorder (ADHD); and larger numbers of ASPD symptoms since age 15.

ASPD is typically at its worst during early and middle adulthood, when most people establish themselves educationally, occupationally, and in important interpersonal relationships. Therefore, antisocial individuals are hard pressed to make up for these lost opportunities for normative accomplishments, regardless of the degree of symptomatic improvement they experience later. Reflecting the lost opportunities, individuals with histories of ASPD experience poor QOL, even after remission, in ways potentially related to their past behavior. In Robins' (24) 30-year follow-up of a child guidance clinic cohort, 85% of respondents with sociopathic PD in adulthood demonstrated poor work histories, 79% had been financially dependent, 81% reported marital difficulty, 60% had histories of "vagrancy," and 47% reported being "nervous." Similarly, 26% of men admitted to a tertiary care hospital for ASPD and followed up 16 to 45 years later by Black et al. (25) reported being "disabled," 39% reported unstable work histories, 44% reported periods when their income was insufficient to provide for their families, and 30% reported having needed public financial support. They were significantly more likely than inpatients admitted for schizophrenia, but less likely than those admitted for depression or surgery (appendectomy or herniorrhaphy), and followed for comparable lengths of time to have "good" marital outcomes (married, widowed). Similarly, former inpatients with ASPD were less likely than depressed or surgical ex-patients to have "good" occupational (employed, retired, student, or homemaker) and psychiatric (no current problems) outcomes. Conversely, former inpatients with ASPD were less likely than those with schizophrenia to have "poor" marital (never married) and occupational (incapacitated by mental illness) outcomes. However, they were more likely than former surgical inpatients to have "poor" residential outcomes (psychiatrically hospitalized), and more likely than both the surgical and depressed former inpatients to have "poor" occupational and psychiatric (incapacitating problems) outcomes. The interpretation of these findings is limited by the unclear extent to which the 4 patient

groups were sociodemographically comparable and the fact that the comparison patients were admitted in the 1930s and 1940s, whereas the patients with ASPD were admitted between 1945 and 1970 (29). Nevertheless, serious functional impairment and poor QOL despite symptomatic remission have been documented in prospective studies of borderline PD (30,31), with which ASPD shares traits including impulsivity and risk-taking.

The *Diagnostic and Statistical Manual of Mental Disorders – Third Edition* (DSM-III) (32), the *Diagnostic and Statistical Manual of Mental Disorders – Third Edition, Revised* (DSM-III-R) (33) and the *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition* (DSM-IV) (34) have required both conduct disorder (CD) before, and a persistent pattern of aggressive, impulsive, irresponsible, and remorseless behaviors since, age 15, for the ASPD diagnosis. However, syndromal antisocial behavior in adulthood without diagnosable CD before age 15 (adulthood antisocial behavioral syndrome, or AABS; not a DSM diagnosis) is at least as common as ASPD (15,35–38). In cross-sectional studies, individuals with AABS display fewer antisocial symptoms in adulthood than those with ASPD (37,39), but the groups differ little on symptom profiles, psychiatric and medical comorbidity (5,35,36,38,40), and health-related QOL (5).

No prospective clinical follow-ups of AABS, nor comparisons of patients with ASPD versus AABS, have been reported. In the NESARC, Goldstein and Grant (28) found no differences in persistence of symptomatic behaviors over 3-year follow-up between respondents with ASPD and those with AABS after adjustment for sociodemographic and Wave 1 lifetime diagnostic covariates as well as antisocial symptom counts between age 15 and Wave 1. These results add to the evidence that AABS is clinically important, and more similar to than different from ASPD. Whether ASPD and AABS differ in prospectively assessed QOL, however, has not been investigated.

Comparisons of QOL outcomes between ASPD and AABS may yield implications for the nosology of antisocial syndromes and interventions to reduce burden on affected individuals, their families and social networks, and the larger society. In addition, the validity of DSM-IV criteria for ASPD has been questioned because of the emphasis on overt, physically aggressive behaviors predominant in men, versus limited attention to covert behaviors and relational aggression that may represent female-typical antisociality (41). The relevance of CD onset before age 15 in women has also been questioned (42–44), in part because the earliest onsets are underrepresented in women (45–47). If DSM-IV criteria for ASPD, and by extension AABS, are biased with respect to sex, QOL outcomes of antisocial syndromes, and implications for treatment and prevention, may also differ importantly by sex. Almost no outcome studies have included sufficient women to yield meaningful sex-specific results. Another important knowledge gap concerns whether associations of antisociality with QOL are modified by age. Like antisocial behaviors, some measures of physical health-related QOL are inversely associated with age, but associations of mental health-related QOL measures with age are less consistent (48–50). Modifications by age of antisociality-QOL relationships may also carry implications for interventions to reduce antisociality-related burden. Aims of the Study

To compare measures of health-related quality of life, employment, financial dependency, perceived stress, and participation in social relationships at Wave 2 among respondents with antisocial personality disorder, syndromal antisocial behavior in adulthood without conduct disorder before age 15, or no lifetime antisocial syndrome at baseline, and to examine whether associations of antisocial syndromes with quality-of-life outcomes were modified by sex or baseline age.

Material and methods

Sample

The research protocol, including informed consent procedures, received full approval from the institutional review board of the United States Census Bureau and the Office of Management and Budget. The 2004–2005 Wave 2 NESARC is the longitudinal follow-up of the Wave 1 NESARC, conducted in 2001–2002 by the National Institute on Alcohol Abuse and Alcoholism (51,52). The Wave 1 NESARC, with an overall response rate of 81.0%, was a nationally representative survey utilizing face-to-face interviews with 43,093 respondents 18 years and older residing in households and selected group quarters; Blacks, Hispanics, and individuals 18 to 24 years old were oversampled (2). Face-to-face reinterviews were attempted in Wave 2 with all Wave 1 respondents. Excluding those ineligible due to death, deportation, active military duty throughout the follow-up period, or physical or mental impairment, the Wave 2 response rate was 86.7%. The cumulative response rate at Wave 2, the product of the Wave 1 and Wave 2 rates, was 70.2% (51,52).

Assessments

Antisocial Behavioral Syndromes—The diagnostic interview used in the NESARC was the National Institute on Alcohol Abuse and Alcoholism Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV Version (AUDADIS-IV), for Waves 1 (53) and 2 (54). Antisocial behavioral syndromes were diagnosed on a lifetime basis at Wave 1. An AUDADIS-IV diagnosis of ASPD required the specified numbers of CD symptoms with onset before, and adult antisocial behaviors since, age 15. Consistent with DSM-IV, at least 1 CD symptom before age 15 must have caused social, academic, or occupational impairment. AABS was defined as meeting all ASPD criteria except CD before age 15. Test-retest reliability of the ASPD diagnosis was good ($\kappa=0.67$) and convergent validity good to excellent (15).

Wave 2 QOL Outcome Measures—Past-month health-related QOL was assessed with the Short-Form 12-Item Health Survey, version 2 (SF-12 v2) (55). In addition to the Physical Component Summary (PCS) and Mental Component Summary (MCS) scales, the SF-12 v2 yields 4 physical health (Physical Functioning, Role Physical, Bodily Pain, and General Health) and 4 mental health (Vitality, Social Functioning, Role Emotional, and Mental Health) domain-specific profile scores. Standard norm-based scoring techniques were used to transform each score (range, 0 – 100) to yield a mean of 50 and a standard deviation of 10. Lower scores indicate poorer QOL.

Respondents' perceptions of stress over the preceding 12 months were measured using the Perceived Stress Scale-4 (PSS-4) (56). Items queried frequencies with which respondents felt: (1) unable to control important things in their lives; (2) confident about their abilities to handle personal problems; (3) that things were going their way; and (4) that difficulties were piling up so high that they could not overcome them. Items 2 and 3 were reverse coded so that higher scores indicated greater perceived stress. Test-retest reliability of the PSS-4 was excellent (intraclass correlation coefficient [ICC]=0.82) (57).

Participation in social relationships was assessed using items from the Social Network Index (SNI) (58). Respondents were asked how many close friends they had and how many they saw or talked with by phone or Internet at least every 2 weeks. Respondents were also asked how many relatives, excluding spouses, partners, children, parents and parents-in-law, they felt close to, how many of those individuals they communicated with at least every 2 weeks, and how many neighbors they saw or spoke with at least every 2 weeks. Test-retest reliability of the SNI was good (ICC=0.70) (57).

In addition to these subjective measures of QOL, objective measures included past-year employment, defined as any paid or unpaid work, including at a family business or farm. Financial dependency was assessed as past-year receipt of Supplemental Security Income (SSI), cash welfare assistance, and food stamps.

Other Psychiatric and Substance Use Disorders—Lifetime substance use (alcohol abuse and dependence, drug-specific abuse and dependence, and nicotine dependence), mood (primary major depressive disorder [MDD], dysthymia, and bipolar I and bipolar II disorders), and anxiety disorder diagnoses except posttraumatic stress disorder (PTSD) (primary panic disorder with and without agoraphobia, social and specific phobias, and generalized anxiety disorder) are based on the Wave 1 interview. These measures are described in detail elsewhere (12,13,57,59–63). Consistent with DSM-IV, primary AUDADIS-IV mood and anxiety disorder diagnoses excluded substance-induced cases and those due to general medical conditions. MDD diagnoses further excluded bereavement. Diagnoses of PTSD and attention-deficit/hyperactivity disorder (ADHD), were assessed on a lifetime basis at Wave 2 (57). By definition, the ADHD diagnosis requires onset before age 7 years (32, p. 92), antedating adult antisocial symptomatology.

In addition to ASPD, PDs assessed at Wave 1 included avoidant, dependent, obsessive-compulsive, paranoid, schizoid, and histrionic PDs (2). Borderline, schizotypal, and narcissistic PDs were measured at Wave 2 (57,64). As described in detail elsewhere (2,64), all PDs were assessed on a lifetime basis. Comorbid PDs were included along with lifetime Axis I disorders including PTSD and ADHD that occurred up to Wave 1 as covariates. Test-retest reliabilities for AUDADIS-IV mood, anxiety, substance use disorder, PD, and ADHD diagnoses were fair to good (2,12,13,57, 59–64) and convergent validity was good to excellent (2,13,59–64).

Statistical Analysis—The sample for this report comprises respondents to both waves of the NESARC who were diagnosed with ASPD (n=1,154), AABS (n=4,196), or no antisocial syndrome (n=28,979) at Wave 1. Among respondents eligible for Wave 2 follow-up (alive and not deported, physically or mentally impaired, or on active military duty throughout the follow-up period), this total reflects 86.9% of those classified at Wave 1 with ASPD, 88.5% of those with AABS, and 87.1% of those with no antisocial syndrome, follow-up rates that did not differ significantly across the 3 groups ($\chi^2=4.79$, $df=2$, $p=0.0911$). Standard contingency table approaches and χ^2 statistics compared categorical Wave 1 sociodemographic and clinical characteristics and QOL indicators by antisocial syndrome. Means on PSS-4 and SF-12v2 scale scores were compared by antisocial syndrome using normal-theory analyses of variance.

Multivariable regression was used to predict Wave 2 QOL outcomes by Wave 1 antisocial syndrome. Normal-theory models were used for continuous and binary logistic models were used for categorical outcomes. Each model controlled for sociodemographic variables (age treated as continuous), family history of antisociality, and lifetime psychiatric comorbidity. In addition to coefficients from normal-theory and odds ratios (ORs) from logistic models, 95% confidence intervals (CIs) were estimated. Coefficients were considered statistically significant at the 0.05 level when associated 95% CIs excluded 0.00; ORs were considered significant when associated 95% CIs excluded 1.00.

To test whether associations of antisocial syndrome with each outcome differed by sex or Wave 1 age, product terms denoting sex by antisocial syndrome and age by antisocial syndrome interactions were added to the main-effects models one at a time, with an α to stay of 0.05. Where no significant interactions were identified, adjusted ORs are reported for the total sample. Where sex by antisocial syndrome interactions were identified, sex-specific

ORs are reported; where age by antisocial syndrome interactions were identified, age-specific ORs are reported for illustrative ages of 25, 40, and 55 years (65). While the choices of illustrative ages are arbitrary, they span the predominant age range of the sample, as well as ages both preceding and following the observed peak prevalences of antisocial syndromes in the fourth decade, with the oldest age well past the point at which improvement or remission has been reported typically to begin (24,25).

As a sensitivity analysis of the extent to which QOL outcomes could reflect ongoing antisocial behavior versus “scars” from previous antisociality, the multivariable models were refit in the subsample of 602 respondents (52.2% of the total) with ASPD, 2658 (62.5% of the total) with AABS, and 24,855 (85.7% of the total) with no antisocial syndrome reporting no antisocial symptoms since Wave 1. These ancillary results are not presented in detail, but were used in the interpretation of findings from the total sample in the Discussion. All analyses utilized SUDAAN (66), which adjusts for the NESARC’s complex design using Taylor series linearization.

Results

Wave 1 Respondent Characteristics by Antisocial Syndrome

Baseline respondent characteristics are given in Table 1. All examined characteristics differed significantly by antisocial syndrome. Respondents with ASPD were most and those with no antisocial syndrome were least likely to be male, in the youngest 2 age groups, and of Native American race or ethnicity; and to reside in the West. Respondents with ASPD were most and those with AABS least likely to report the lowest past-year personal incomes and lifetime educational attainment. Prevalences of all comorbid lifetime psychiatric disorders and family histories of antisocial behavior were highest among respondents with ASPD and lowest among those with no antisocial syndrome.

Respondents in the 2 antisocial groups were similarly likely and those with no antisocial syndrome least likely to report past-year employment. Receipt of all public financial assistance was highest among respondents with ASPD and lowest among those with no antisocial syndrome. SF-12 v2 PCS, MCS, and most domain-specific scores were lowest among respondents with ASPD and highest in the nonantisocial group.

Wave 2 QOL Outcomes

Unadjusted—Unadjusted comparisons of Wave 2 QOL outcomes by Wave 1 antisocial syndrome are given for descriptive purposes in Table 2. As in Wave 1, respondents with ASPD were most and nonantisocial respondents least likely to report past-year receipt of all public financial support. Also, in general, respondents with ASPD obtained the lowest and those with no antisocial syndrome the highest scores on the SF-12 v2 scales. Conversely, PSS-4 scores were highest in the group with ASPD and lowest in the nonantisocial group. Differences were modest, but respondents with ASPD were least and those with no antisocial syndrome most likely to report feeling close to any relatives besides spouses, partners, children, parents, and parents-in-law, seeing or speaking with any of these relatives at least every 2 weeks, having any close friends, communicating with any close friends at least every 2 weeks, and communicating with any neighbors at least every 2 weeks.

Adjusted—Table 3 depicts adjusted associations of antisocial syndromes with QOL outcomes. ASPD at Wave 1 significantly and negatively predicted past-year employment. AABS at Wave 1 predicted significantly increased odds of past-year welfare receipt and reduced odds of regular communication with close friends. While the OR for communication with close friends was virtually identical in the group with ASPD, it was not

statistically significant. Both antisocial syndromes predicted significantly reduced odds of reporting any close friends, but neither syndrome predicted regular communication with neighbors. Only ASPD predicted reduced odds of regular communication with close relatives.

Significant age by antisocial syndrome interactions were observed for past-year receipt of SSI and food stamps as well as all SF-12 v2 physical health scales. Both ASPD and AABS predicted significantly increased likelihood of past-year food stamps at all ages, as well as past-year SSI and lower scores on SF-12 v2 physical health scales among respondents older at Wave 1. However, as evidenced by broadly overlapping 95% CIs, neither ORs nor coefficients differed by antisocial syndrome except for past-year food stamps among respondents oldest at baseline.

Significant sex by antisocial syndrome interactions were observed for feeling close to any relatives and the SF-12v2 MCS, Vitality (how much of the time respondents had a lot of energy), and Social Functioning (interference by physical or emotional problems in interactions with friends or relatives), as well as PSS-4 scores. Both syndromes predicted reduced odds of feeling close to relatives among women, whereas only ASPD did so among men. Notwithstanding the significant interaction term, no sex-specific coefficients were themselves significant for the MCS. AABS predicted lower Vitality score among women and higher Social Functioning score among men, whereas ASPD predicted poorer Social Functioning score among women; the coefficients for women and men with ASPD differed significantly from one another, as indicated by nonoverlapping 95% CIs. Both ASPD and AABS predicted higher PSS-4 scores among women. Neither antisocial syndrome predicted SF-12 v2 Role Emotional or Mental Health scores.

Discussion

This paper presents the first nationally representative, prospective data describing 3-year quality-of-life (QOL) outcomes of antisocial personality disorder (ASPD) and adulthood antisocial behavioral syndrome (AABS) among adults in the USA. While generally modest, the prediction by both syndromes of significantly poorer employment status and physical health-related QOL, greater financial dependency, and poorer social relationship outcomes is consistent with study hypotheses and findings from clinical follow-ups (24–26,29). These results also extend previous findings (24–26,29) by demonstrating similar QOL outcomes of ASPD and AABS, as well as modification of many associations by age.

That respondents with baseline ASPD were less likely to report past-year employment, those with AABS were more likely to report past-year welfare, and those in both antisocial groups were more likely to report past-year food stamps, might reflect persistence of work-related or financial irresponsibility that constitutes one of the DSM-defined antisocial diagnostic criteria (34). Under this scenario, antisocial respondents whose symptomatic behaviors had remitted would not differ significantly from nonantisocial individuals on these outcomes. The diminution in the odds ratio (OR) for AABS and welfare receipt from 1.82 (95% confidence interval [CI]=1.28, 2.58) to 1.35 (95% CI=0.80, 2.26) in the symptomatically remitted subsample provides some support for this interpretation. However, arguing against it is that the OR for ASPD was unchanged, albeit nonsignificant (1.60, 95% CI=0.98, 2.60 in the total sample, versus 1.59, 95% CI=0.72, 3.52), in the remitted subsample. While the earlier onset and greater symptomatic severity in adulthood of ASPD could explain these observations, their similarity in clinical presentation and course (5,28,39,67) makes it unlikely that remitted ASPD and AABS differ fundamentally in their predictions of welfare dependency. Similarly, the OR for employment among respondents with ASPD changed little from the total sample (0.64, 95% CI=0.50, 0.84) to the remitted subsample (0.71, 95%

CI=0.52, 0.96). The age by antisocial syndrome interaction was lost in the remitted subsample for food stamps, but the main-effect ORs for ASPD (2.12, 95% CI=1.29, 3.47) and AABS (1.53, 95% CI=1.21, 1.95) were both significant and compatible with the age-specific ORs in the total sample.

Even if antisocial symptoms remitted long ago, affected individuals would likely have difficulty finding and keeping jobs, particularly ones paying well enough to support them and their dependents adequately, because the damage from their symptomatic behavior has been done. For example, while we controlled for Wave 1 education, this may not be a suitable marker among antisocial respondents for acquisition of marketable skills or “soft” interpersonal characteristics needed to sustain employment. Moreover, besides criminal convictions, antisocial individuals often have adverse employment histories and credit problems that make them undesirable to employers (68,69), particularly in difficult economic circumstances.

Antisocial respondents’ reduced employment and greater financial dependency at Wave 2 may also reflect disability. Both ASPD and AABS predicted lower scores on all Short-Form 12-Item Health Survey, version 2 (SF-12v2) physical health scales and greater past-year receipt of Supplemental Security Income (SSI), which requires age at least 65, blindness, or disability in addition to very limited income and assets, among respondents older at baseline. In the symptomatically remitted subsample, statistical significance was lost for the age by antisocial syndrome interaction in SSI; however, no findings concerning employment or financial dependency changed direction, the main-effect ORs for SSI were compatible with the age-specific ORs in the total sample, and almost all findings concerning the SF-12v2 physical health scales retained significance. Our results are consistent with the report by Black et al. (25) that 26% of men previously hospitalized for ASPD reported being “disabled.”

The modification of these relationships by age, with poorer showing on the SF-12v2 physical health scales by antisocial respondents older at baseline, suggests that increasing age may accentuate adverse impacts of histories of antisociality on physical health-related QOL, or that antisociality may accentuate associations (48–50) of advanced age with lower QOL scores. The persistence of most interactions in the remitted subsample further suggests that poorer QOL may in part reflect “scars” of previous problematic behavior. In addition to sustaining repeated injuries, likely as results of aggressive, impulsive, or reckless behavior, affected individuals may utilize medical care inappropriately, e.g., in settings such as emergency departments that do not facilitate continuity of care, for both injuries and chronic medical conditions, because of their impaired ability to cultivate effective working relationships with providers (5,7). The accumulated effects of homelessness and poor nutrition, plausibly due to unemployment or financial irresponsibility, may also be contributory.

Maddocks (70) reported that, at 5-year follow-up, about 1 in 5 “untreated psychopaths” seen as psychiatric outpatients in the United Kingdom had “settled down,” including improved ability to sustain friendships. In the present study, over 90% of respondents in each group reported any close friends, and over 80% reported regular communication with any, at Wave 2. Large majorities in each group also reported regular communication with relatives to whom they felt close. However, the reduced odds in the antisocial groups are unsurprising given the aggressive, irresponsible, deceitful, and reckless behaviors that define both syndromes. In the remitted subsample, the ORs, while only significant for AABS and communication with close friends, were numerically similar, again suggesting long-term adverse impacts of even past antisociality.

In contrast to physical health, financial dependency, friendship, and communication with relatives, findings concerning mental health-related QOL outcomes yielded limited support for study hypotheses. The lack of significant age by antisociality interactions for any SF-12 v2 mental health scales is compatible with the lack of consistent associations between Mental Component Summary (MCS) scores and age in other general population samples (48–50). However, that neither antisocial syndrome predicted SF-12 v2 Role Emotional and Mental Health scores was unexpected and contrasts with highly significant cross-sectional associations of ASPD with SF-12 v2 mental health measures at Wave 1 (15). Antisocial respondents who completed the Wave 2 interview may have experienced particularly low levels of impairment in some domains of mental health-related QOL. Why the prospectively observed relationships of antisociality to mental health-related QOL differ by domain, however, is unclear and requires further investigation.

Sex by antisocial syndrome interactions were observed for SF-12 v2 MCS, Vitality, and Social Functioning scores, Perceived Stress Scale-4 (PSS-4) scores, and having any relatives to whom respondents felt close. Except for MCS scores, at least one group of antisocial women fared significantly worse than nonantisocial respondents on each scale. Of note, only AABS among women predicted significantly higher PSS-4 score, and no antisociality–SF-12 v2 mental health scale relationships remained significant, in the remitted subsample, suggesting that associations in the total sample may have reflected active antisociality more than “scars” from past misbehavior. Both antisocial syndromes predicted reduced odds that women would feel close to any relatives, but only ASPD did so for men. ORs remained essentially unchanged in both sexes but lost significance among the symptomatically remitted subsample except for AABS in women.

The poorer Vitality outcomes among women with AABS and greater perceived stress among women with both antisocial syndromes may reflect gendered differences in life demands and stressors (41). For example, 57.7% of women with ASPD, 48.8% with AABS, and 35.7% with no antisocial syndrome had children under age 15 in their households at Wave 1. Parallel figures among men were 41.1% with ASPD, 37.0% with AABS, and 32.8% with no antisocial syndrome. Moreover, 65.1% of women with ASPD and 60.5% of those with AABS (versus 42.5% of men with ASPD and 31.7% with AABS) reported Wave 1 past-year incomes under \$20,000, which may increase their likelihood of adversities such as residence in disadvantaged or unsafe neighborhoods or communities (71,72). Additionally, women, particularly those with antisocial syndromes, reported more Wave 1 past-year stressful life events on average (ASPD: 3.96; AABS: 3.06; no antisocial syndrome: 1.48) than men (ASPD: 2.95; AABS: 2.30; no antisocial syndrome: 1.32).

The poorer Social Functioning outcomes among women with ASPD, and reduced odds of feeling close to relatives among both groups of antisocial women, could also reflect the greater importance of interpersonal connections in women’s than in men’s lives (73,74). Perceived impairments in social ties or interactions may be appraised as particularly noxious and reported more negatively by women. Antisocial men may also be more likely to make deliberate efforts to sever ties with former friends and relatives (25) and therefore less likely to perceive interference in interpersonal relationships due to physical or emotional problems. That only ASPD, which appears modestly more severe in clinical presentation than AABS (37,39,67), predicted reduced odds of feeling close to relatives among men is also broadly compatible with the possibility that men have a higher threshold for perceiving impairment in family ties. To our knowledge, no data are available on whether relatives and friends apply lower thresholds to antisocial men than to antisocial women for extruding these individuals from family or social circles. If this were so, however, antisocial men might report themselves as better off on Social Functioning or feeling close to relatives simply because of lowered expectations for those connections.

Limitations

Despite the large sizes of both antisocial groups, the reduced size of the symptomatically remitted subsample may have constrained the power of the ancillary analyses. In addition, the 3-year follow-up, while the longest in any nationally representative sample and the only one over which syndromally antisocial respondents were followed, was likely too short to capture fully the effects of antisocial personality disorder (ASPD) and adulthood antisocial behavioral syndrome (AABS) on quality of life (QOL). By design, the National Epidemiologic Survey on Alcohol and Related Conditions targeted adults residing in households and selected group quarters. Therefore, it may not have captured some of the most severely antisocial individuals, e.g., those most likely to have been institutionalized in prisons or forensic psychiatric facilities. As well, the most severely antisocial respondents from the Wave 1 sample may have been unavailable for the Wave 2 interview, e.g., because of incarceration, in which case adverse impacts of antisociality on QOL may have been underestimated. Some caution is also warranted because all data were self-reported, whereas one of the criteria defining antisocial syndromes is deceitfulness. Cottler et al. (75) found reliability of *Diagnostic and Statistical Manual – Third Version, Revised* (DSM-III-R) antisocial symptom reporting no worse among self-reported “habitual liars” than among “nonliars,” and we can identify no obvious source of secondary gain, nor differential stigma, based on respondents’ answers in the survey, particularly given its rigorously guaranteed confidentiality. Nevertheless, systematic variation by antisocial syndrome in veracity of responses cannot be ruled out. Further, because we did not ask symptomatically remitted respondents when their antisocial behavior ceased, we cannot examine the role of duration of remission, or of active antisociality before desistance, in prediction of QOL outcomes.

Implications

Our findings suggest that antisocial syndromes in adulthood, even after symptomatic remission, predict poorer QOL outcomes. Consistent with the conclusions of Gunderson et al. (30) and Zanarini et al. (31) regarding borderline personality disorder (PD), symptom desistance may not adequately define recovery. Current prevalence of symptoms, and residual impairment after remission, may need to be distinguished from the prevalence of antisocial syndromes assessed over the lifespan.

The similarity in prediction of diminished QOL by ASPD and AABS provides additional evidence of their clinical similarity and the limited utility of requiring conduct disorder (CD) before age 15 to diagnose ASPD. These findings also underscore the urgency of identifying mechanisms underlying antisociality-QOL relationships, including their modification by age and sex, and of improving prevention and treatment of antisocial syndromes over the lifespan. Currently available evidence-based preventive and therapeutic interventions for CD (76–79) are generally resource intensive and require sustained, active participation by targeted youth and their families, making implementation challenging. We are aware of no evidence-based prevention curricula targeting later-onset antisociality such as AABS, or the progression of CD to ASPD. It is also unclear whether interventions addressing specific symptoms, e.g., anger management for irritability and aggressiveness, or self-control strategies for impulsivity and recklessness, would yield greater benefit than syndrome-based treatments.

Our findings (28) that comorbid lifetime drug use disorders, additional PDs, and attention-deficit/hyperactivity disorder (ADHD) predicted persistence of antisocial behavior highlighted the importance of comprehensive diagnostic assessments, appropriate treatment of all identified disorders, and examination of contributions of treatment for comorbidity to desistance of antisociality. In this study, independent associations of comorbid disorders with QOL varied across outcomes; however, the most consistent baseline psychopathologic

predictors of poorer QOL were additional PDs and comorbid lifetime mood, anxiety, nicotine dependence, and attention-deficit/hyperactivity disorders. With evidence-based interventions available for these conditions (80–87), the role of treatment for comorbidity in improving QOL outcomes warrants investigation.

Approaches to improving QOL outcomes of antisocial syndromes should be evaluated in both the total targeted population and clinically relevant subgroups, including those defined by age, sex, contextual factors (e.g., family configurations, community characteristics), family histories of antisociality, and constellations of psychiatric comorbidity. Because many antisocial individuals have problems in multiple domains, it will also be important to investigate optimal prioritization of each, considering needs of the identified patients, those affected by their behavior, and the clinical and legal systems within which they may be situated.

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Significant outcomes

- Baseline antisocial syndromes predicted significantly poorer 3-year employment, financial dependency, social relationship, and physical health-related quality-of-life (QOL) outcomes. Prediction of mental health-related QOL outcomes was more modest and less consistent.
- Antisociality-QOL relationships were modified by age for past-year receipt of Supplemental Security Income and food stamps and all physical health-related QOL measures, antisocial respondents older at baseline faring worst. Relationships of antisocial syndromes to several measures of mental health-related QOL and having relatives to whom respondents felt close were modified by sex, women who had antisocial syndromes generally faring worse than never-antisocial comparison respondents.
- Both antisocial personality disorder (ASPD) and syndromal antisocial behavior in adulthood without conduct disorder (CD) before age 15 (AABS) were similarly related to QOL outcomes, suggesting the limited utility of requiring CD before age 15 for the ASPD diagnosis.

Limitations

- Respondents provided all information pertaining to psychiatric and substance use-related symptomatology and quality-of-life (QOL) indicators.
- The 3-year follow-up was likely too short to capture fully the effects of antisocial behavioral syndromes on QOL.
- Because the National Epidemiologic Survey on Alcohol and Related Conditions sampled residents of households and selected group quarters, it may not have captured individuals with the most severe antisocial pathology. Moreover, the most severely antisocial respondents from the baseline sample may have been unavailable for the Wave 2 interview for reasons such as incarceration, potentially leading to underestimation of adverse impacts of antisociality on QOL.

Table 1

Baseline Sociodemographic and Clinical Characteristics by Antisocial Syndrome

Characteristic, % or Mean (SE ^a)	ASPD ^b (n=1154)	AABS ^c (n=4196)	No Antisocial Syndrome (n=28,979)	p-value
Male	73.92% (1.36)	63.85% (0.86)	44.15% (0.37)	<0.0001
Age, years				<0.0001
18–29	37.10% (1.83)	28.54% (0.89)	19.95% (0.38)	
30–44	35.62% (1.72)	38.44% (0.97)	29.56% (0.39)	
45–64	24.15% (1.52)	28.27% (0.78)	31.86% (0.34)	
≥65	3.13% (0.70)	4.75% (0.38)	18.64% (0.39)	
Race/ethnicity				<0.0001
White	70.61% (2.09)	75.24% (1.27)	70.35% (1.64)	
Black	10.20% (1.12)	11.04% (0.82)	11.08% (0.68)	
Native American	5.81% (0.99)	3.52% (0.39)	1.81% (0.17)	
Asian or Pacific Islander	1.89% (0.59)	1.38% (0.30)	4.81% (0.57)	
Hispanic	11.48% (1.58)	8.81% (0.86)	11.94% (1.26)	
Marital status				<0.0001
Married or cohabiting	52.50% (1.86)	57.95% (0.97)	64.28% (0.53)	
Separated, divorced, or widowed	15.87% (1.28)	17.51% (0.66)	16.45% (0.25)	
Never married	31.62% (1.81)	24.54% (0.86)	19.27% (0.49)	
Education				<0.0001
Less than high school	23.28% (1.68)	13.11% (0.72)	14.45% (0.52)	
High school diploma	31.64% (1.58)	28.40% (0.94)	29.05% (0.57)	
Postsecondary	45.09% (1.87)	58.49% (1.14)	56.51% (0.67)	
Worked for pay or as a volunteer in past year	86.14% (1.26)	86.31% (0.64)	72.80% (0.43)	<0.0001
Past-year personal income				<0.0001
<=\$19,999	48.37% (1.94)	42.12% (1.01)	46.73% (0.64)	
\$20,000–34,999	25.43% (1.58)	24.17% (0.87)	22.54% (0.41)	
\$35,000–69,999	19.96% (1.36)	25.44% (0.85)	22.20% (0.44)	
>=\$70,000	6.24% (0.88)	8.27% (0.65)	8.53% (0.43)	
Current receipt of public financial support				
Welfare	2.94% (0.55)	2.06% (0.29)	0.98% (0.09)	<0.0001
Supplemental Security Income	5.01% (0.72)	3.24% (0.32)	2.69% (0.14)	0.0009
Food stamps	10.90% (1.31)	6.36% (0.43)	3.45% (0.18)	<0.0001
Region				0.0002
Northeast	14.83% (2.63)	15.96% (2.46)	20.48% (3.51)	
Midwest	24.93% (3.26)	26.16% (2.99)	22.54% (3.16)	
South	30.32% (3.22)	33.58% (2.87)	35.79% (3.27)	
West	29.92% (3.61)	24.30% (3.10)	21.19% (3.42)	
Urban (vs. rural) residence	78.80% (2.22)	76.86% (1.92)	79.83% (1.64)	0.0495
Family history of antisocial behavior	61.43% (1.96)	47.88% (0.98)	17.78% (0.46)	<0.0001
Comorbid psychiatric disorders				

Characteristic, % or Mean (SE ^a)	ASPD ^b (n=1154)	AABS ^c (n=4196)	No Antisocial Syndrome (n=28,979)	p-value
Any mood disorder	51.35% (1.82)	38.88% (0.95)	15.06% (0.35)	<0.0001
Any anxiety disorder	45.26% (1.79)	33.97% (0.93)	17.28% (0.41)	<0.0001
Any alcohol use disorder	76.46% (1.50)	71.09% (0.94)	22.19% (0.63)	<0.0001
Any drug use disorder	52.91% (2.07)	35.50% (0.94)	4.70% (0.19)	<0.0001
Nicotine dependence	55.20% (2.05)	40.98% (0.97)	12.19% (0.37)	<0.0001
Attention-deficit/hyperactivity disorder	12.26% (1.16)	6.04% (0.51)	1.51% (0.09)	<0.0001
Any additional personality disorder	56.29% (1.70)	39.52% (0.98)	15.12% (0.30)	<0.0001
Short-Form 12-Item Health Survey, version 2 (SF-12v2)				
physical health scale scores				
Physical Component Summary	49.32 (0.43)	50.97 (0.21)	50.97 (0.11)	0.0014
Physical Functioning	50.35 (0.41)	51.82 (0.18)	51.76 (0.10)	0.0047
Role Physical	49.29 (0.45)	51.10 (0.20)	51.59 (0.10)	<0.0001
Bodily Pain	46.95 (0.48)	49.34 (0.23)	50.60 (0.10)	<0.0001
General Health	47.56 (0.46)	49.68 (0.24)	51.29 (0.14)	<0.0001
SF-12 v2 mental health scale scores				
Mental Component Summary	47.91 (0.42)	50.13 (0.18)	53.20 (0.07)	<0.0001
Vitality	51.13 (0.41)	52.30 (0.20)	54.52 (0.11)	<0.0001
Social Functioning	47.91 (0.47)	50.68 (0.20)	52.56 (0.07)	<0.0001
Role Emotional	47.88 (0.45)	50.03 (0.19)	51.64 (0.08)	<0.0001
Mental Health	47.49 (0.42)	49.73 (0.19)	52.90 (0.09)	<0.0001

^aSE: standard error

^bASPD: antisocial personality disorder

^cAABS: adult antisocial behavioral syndrome

Table 2

Unadjusted Wave 2 Quality-of-Life Outcomes by Wave 1 Antisocial Syndrome

Characteristic, % or Mean (SE) ^a	ASPD ^b (n=1154)	AABS ^c (n=4196)	No Antisocial Syndrome (n=28,979)	p-value
Worked for pay or as a volunteer in past year	79.78% (1.66)	82.75% (0.76)	70.14% (0.43)	<0.0001
Past-year receipt of public financial support				
Welfare	2.49% (0.43)	1.95% (0.23)	0.86% (0.08)	<0.0001
Supplemental Security Income	5.16% (0.73)	3.78% (0.31)	2.90% (0.15)	0.0003
Food stamps	14.91% (1.24)	9.05% (0.56)	4.79% (0.24)	<0.0001
Short-Form 12-Item Health Survey, version 2 (SF-12v2) physical health scale scores				
Physical Component Summary	48.80 (0.47)	50.22 (0.21)	50.31 (0.11)	0.0075
Physical Functioning	49.73 (0.44)	51.04 (0.19)	50.80 (0.11)	0.0218
Role Physical	48.00 (0.42)	49.36 (0.20)	50.13 (0.10)	<0.0001
Bodily Pain	47.93 (0.48)	49.74 (0.22)	50.98 (0.10)	<0.0001
General Health	46.89 (0.51)	49.26 (0.24)	50.08 (0.13)	<0.0001
SF-12v2 mental health scale scores				
Mental Component Summary	48.08 (0.42)	49.80 (0.19)	51.84 (0.09)	<0.0001
Vitality	50.43 (0.39)	51.23 (0.21)	52.58 (0.12)	<0.0001
Social Functioning	48.72 (0.42)	50.74 (0.18)	51.90 (0.08)	<0.0001
Role Emotional	46.66 (0.43)	48.66 (0.21)	49.65 (0.09)	<0.0001
Mental Health	48.31 (0.41)	50.03 (0.20)	52.39 (0.09)	<0.0001
Perceived Stress Scale-4 score	9.02 (0.12)	8.43 (0.06)	7.73 (0.03)	<0.0001
Feels close to any relatives (excluding spouses, partners, children, parents and parents-in-law)	82.00% (1.40)	87.32% (0.58)	89.79% (0.24)	<0.0001
Sees or talks to any close relatives (excluding spouses, partners, children, parents and parents-in-law) at least every 2 weeks	66.24% (1.68)	73.19% (0.83)	77.28% (0.36)	<0.0001
Has any close friends	91.04% (1.02)	93.96% (0.45)	94.58% (0.19)	0.0028
Sees or talks to any close friends at least every 2 weeks	87.24% (1.17)	88.73% (0.64)	89.96% (0.25)	0.0268
Sees or talks to any neighbors at least every 2 weeks	62.40% (1.81)	66.79% (0.85)	69.90% (0.40)	<0.0001

^aSE: standard error^bASPD: antisocial personality disorder^cAABS: adult antisocial behavioral syndrome

Table 3Adjusted^a Wave 2 Quality-of-Life Outcomes by Wave 1 Antisocial Syndrome

Odds Ratios (95% Confidence Intervals)		
Wave 2 Outcome	ASPD ^b versus No Antisocial Syndrome	AABS ^c versus No Antisocial Syndrome
Employed in past year	0.64 (0.50, 0.84)	0.94 (0.82, 1.09)
Past-year receipt of public financial support Welfare Supplemental Security Income	1.60 (0.98, 2.60)	1.82 (1.28, 2.58)
Age 25 years	0.84 (0.55, 1.29)	0.95 (0.66, 1.37)
Age 40 years	1.31 (0.89, 1.92)	1.26 (0.97, 1.64)
Age 55 years	2.05 (1.25, 3.36)	1.67 (1.27, 2.20)
Food stamps		
Age 25 years	1.64 (1.19, 2.25)	1.54 (1.25, 1.90)
Age 40 years	2.54 (1.90, 3.40)	1.66 (1.39, 1.98)
Age 55 years	3.94 (2.49, 6.24)	1.80 (1.41, 2.29)
Feels close to any relatives (excluding spouses, partners, children, parents, and parents-in-law)		
Men	0.74 (0.57, 0.97)	1.02 (0.88, 1.19)
Women	0.59 (0.40, 0.87)	0.71 (0.58, 0.87)
Sees or talks to any close relatives (excluding spouses, partners, children, parents, and parents-in-law) at least every 2 weeks	0.72 (0.60, 0.87)	0.92 (0.83, 1.03)
Has any close friends	0.61 (0.44, 0.84)	0.78 (0.64, 0.95)
Sees or talks to any close friends at least every 2 weeks	0.80 (0.63, 1.03)	0.81 (0.70, 0.94)
Sees or talks to any neighbors at least every 2 weeks	0.97 (0.81, 1.16)	1.02 (0.93, 1.13)
Coefficients (95% Confidence Intervals)		
Wave 2 Outcome	ASPD ^b versus No Antisocial Syndrome	AABS ^c versus No Antisocial Syndrome
Short-Form 12-Item Health Survey, version 2 (SF-12v2) physical health scale scores		
Physical Component Summary		
Age 25 years	-0.14 (-1.09, 0.81)	0.13 (-0.37, 0.63)
Age 40 years	-1.99 (-2.90, -1.08)	-0.84 (-1.24, -0.44)
Age 55 years	-3.83 (-5.44, -2.22)	-1.82 (-2.47, -1.17)
Physical Functioning		
Age 25 years	0.00 (-0.82, 0.82)	0.30 (-0.18, 0.78)
Age 40 years	-1.59 (-2.46, -0.72)	-0.52 (-0.94, -0.10)
Age 55 years	-3.19 (-4.73, -1.65)	-1.33 (-2.01, -0.65)
Role Physical		
Age 25 years	-0.82 (-1.82, 0.18)	-0.26 (-0.79, 0.27)
Age 40 years	-1.56 (-2.38, -0.74)	-0.92 (-1.34, -0.50)
Age 55 years	-2.31 (-3.82, -0.80)	-1.59 (-2.24, -0.94)
Bodily Pain		

Odds Ratios (95% Confidence Intervals)		
Wave 2 Outcome	ASPD ^b versus No Antisocial Syndrome	AABS ^c versus No Antisocial Syndrome
Age 25 years	0.05 (−1.06, 1.16)	0.28 (−0.26, 0.82)
Age 40 years	−1.47 (−2.36, −0.58)	−0.61 (−1.06, −0.16)
Age 55 years	−2.98 (−4.45, −1.51)	−1.50 (−2.21, −0.79)
General Health		
Age 25 years	0.12 (−1.03, 1.27)	0.09 (−0.54, 0.72)
Age 40 years	−1.85 (−2.81, −0.89)	−0.60 (−1.09, −0.11)
Age 55 years	−3.82 (−5.41, −2.23)	−1.29 (−2.10, −0.48)
SF-12 v2 mental health scale scores		
Mental Component Summary		
Men	0.58 (−0.38, 1.54)	0.44 (−0.05, 0.93)
Women	−1.11 (−2.65, 0.43)	−0.43 (−1.02, 0.16)
Vitality		
Men	−0.06 (−0.98, 0.86)	−0.09 (−0.64, 0.46)
Women	−1.06 (−2.45, 0.33)	−1.04 (−1.64, −0.44)
Social Functioning		
Men	0.44 (−0.54, 1.42)	0.55 (0.06, 1.04)
Women	−2.51 (−3.99, −1.03)	−0.51 (−1.13, 0.11)
Role Emotional	−0.65 (−1.48, 0.19)	−0.08 (−0.55, 0.38)
Mental Health	−0.16 (−0.94, 0.63)	−0.20 (−0.64, 0.24)
Perceived Stress Scale-4 score		
Men	−0.06 (−0.32, 0.20)	−0.05 (−0.21, 0.11)
Women	0.57 (0.12, 1.02)	0.31 (0.14, 0.48)

^aControlling for age, sex, race/ethnicity, marital status, education, past-year personal income, region and urbanicity of respondent residence, family history of antisocial behavior, and comorbid Wave 1 lifetime substance use, mood, anxiety, and personality disorders. Odds ratios and coefficients statistically significant at the 0.05 level are shown in **bold font**.

^bASPD: antisocial personality disorder

^cAABS: adult antisocial behavioral syndrome