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Original Research

Trends in Mental Well-Being of Non-Hispanic White Children of Midlife Parents With Low Education

Neeraj Bhandari[1]

Abstract

Background: It is unknown whether recent increase in mortality and morbidity linked to mental despair (eg, suicide, opioid addiction, alcoholism) in midlife non-Hispanic whites (NHWs) was accompanied by declines in mental well-being of NHW children. The author examined aggregate trends in the mental well-being of NHW children between 2003 and 2018.

Methods: The author used linear (unadjusted) regression to generate estimates of long period (ie, between 2003-2005 and 2016-2018) and annual change in mental well-being and self-assessed health from the National Health Interview Survey data on 68 057 NHW children (aged 4-17 years).

Results: The NHW children showed no significant change in any of the tracked indicators (composite Strength and Difficulties Questionnaire [SDQ] 5-item score: long period: -0.03, 95% confidence interval [CI]: -0.09 to 0.02, annual: -0.00, 95% CI: -0.01 to 0.00; severe impairment in mental function: long period: 0.01, 95% CI: 0.00 to 0.02; subjective perception of overall health: long period: -0.01, 95% CI: -0.01 to -0.00). The author did not detect any gradient of worsening SDQ scores with parental midlife status and low parental education. However, the trends in SDQ scores in NHW children were slightly worse than those for children of other major race/ethnic groups,

Conclusion: The author did not find evidence of worsening mental distress in NHW children overall or whose parents were in their midlives and less educated.

Keywords
child mental health, self-assessed health, health disparities

Introduction

The United States along with other developed countries has seen a decade-long increase in life expectancy that has been broadly shared across race/ethnic groups. Recent research has raised concern that these survival gains may be at risk due to what has been termed "deaths of despair."[1] These trends, most severe in midlife non-Hispanic whites (NHWs), consist of striking increases in mortality due to suicide, drug overdose, and alcoholic liver disease sufficient to overwhelm secular declines in mortality from all other causes. Researchers have documented parallel increases in midlife morbidity, mainly comprising increases in serious mental illness, disability, and pain. Parental stress can affect child mental health through a number of pathways.[2,3] Family environment marred with high levels of emotional conflict and impaired cohesion is known to induce internalizing (eg, anxiety or depression) and externalizing problems (eg, aggressiveness, deviant behavior,

delinquency) in children while providing scant emotional support and poor parental monitoring during crises. Whether these adverse trends in midlife NHW adults were accompanied by declines in mental well-being of NHW children is unknown. The author examined this issue by exploring *aggregate* statistical trends in the mental well-being of NHW children from 2003 to 2018 and comparing these trends to similar trends in

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Table 1. Unadjusted Long Period and Annual Change in Key Indicators Well-Being Among NH White Children Aged 4 to 17 Years, Along With Differences From Similar Trends Among Other Major Race/Ethnic Groups.[a]

Study Group	SDQ Score (Range 0-10)[b,c,d]		Severe Difficulties With Emotion, Behavior, Concentration, or Getting Along[e] (Range 0-1)		Health Worse Than Before[e] (Range 0-1)	
	Change Since 2003-2005 (95% CI)	Annual Change (95% CI)	Change Since 2003-2005 (95% CI)	Annual Change (95% CI)	Change Since 2003-2005 (95% CI)	Annual Change (95% CI)
All children	N = 26 403, 2003-2005 mean = 1.71	N = 59 852, mean = 1.68	N = 26 798, 2003-2005 mean = 0.05	N = 67 466, mean = 0.06	N = 27 057, 2003-2005 mean = 0.02	N = 68 057, mean = 0.01
Change in NH whites	−0.03 (−0.09 to 0.02)	−0.00 (−0.01 to 0.00)	0.01 (0.00 to 0.02)	0.00 (0.00 to 0.00)	−0.01 (−0.01 to −0.00)	−0.00 (−0.00 to −0.00)
Racial/ethnic differences in change (reference group is NH white)						
NH blacks	−0.22 (−0.34 to −0.09)	−0.02 (−0.03 to −0.01)	0.00 (−0.02 to 0.02)	−0.00 (−0.00 to 0.00)	−0.01 (−0.00 to 0.02)	0.00 (−0.00 to 0.00)
Hispanics	−0.31 (−0.40 to −0.21)	−0.02 (−0.03 to −0.02)	−0.00 (−0.01 to 0.01)	−0.00 (−0.00 to 0.00)	−0.01 (−0.01 to 0.00)	0.00 (−0.00 to 0.00)
NH Asians	−0.32 (−0.48 to −0.17)	−0.02 (−0.03 to −0.01)	−0.01 (−0.03 to −0.00)	−0.00 (−0.00 to −0.00)	−0.01 (−0.00 to 0.02)	0.00 (−0.00 to 0.00)
NH others	−0.36 (−0.80 to 0.08)	−0.01 (−0.05 to 0.02)	0.02 (−0.04 to 0.08)	0.00 (−0.00 to 0.01)	−0.03 (−0.07 to 0.01)	−0.00 (−0.00 to 0.00)
Children with parents aged 45-55[f]	N = 9487, 2003-2005 mean = 1.63	N = 21 997, mean = 1.57	N = 9623, 2003-2005 mean = 0.05	N = 24 967, mean = 0.05	N = 9711, 2003-2005 mean = 0.02	N = 25 190, mean = 0.02
Change in NH whites	−0.06 (−0.15 to 0.03)	−0.00 (−0.01 to 0.00)	0.00 (−0.00 to 0.02)	0.00 (−0.00 to 0.00)	−0.01 (−0.01 to 0.00)	−0.00 (−0.00 to −0.00)
Racial/ethnic differences in change (reference group is NH white)						
NH blacks	−0.21 (−0.52 to 0.11)	−0.01 (−0.03 to 0.00)	−0.01 (−0.05 to 0.03)	−0.00 (−0.00 to 0.00)	0.03 (0.00 to 0.06)	0.00 (0.00 to 0.00)
Hispanics	−0.32 (−0.50 to −0.14)	−0.03 (−0.04 to −0.02)	0.01 (−0.01 to 0.03)	−0.00 (−0.00 to 0.00)	−0.01 (−0.02 to 0.01)	−0.00 (−0.00 to 0.00)
NH Asians	−0.15 (−0.37 to 0.06)	−0.01 (−0.03 to 0.00)	−0.01 (−0.02 to 0.01)	−0.00 (−0.00 to 0.00)	0.00 (−0.01 to 0.02)	0.00 (−0.00 to 0.00)
NH others	−0.08 (−0.89 to 0.73)	0.02 (−0.04 to 0.08)	0.05 (−0.01 to 0.11)	0.00 (−0.01 to 0.01)	−0.07 (−0.20 to 0.06)	−0.00 (−0.01 to 0.00)
Children with parents aged 45-55 with high school or less education[g]	N = 2771, 2003-2005 mean = 1.88	N = 6638, mean = 1.86	N = 2823, 2003-2005 mean = 0.06	N = 7645, mean = 0.06	N = 3516, 2003-2005 mean = 0.03	N = 7723, mean = 0.02
Change in NH whites	0.09 (−0.10 to 0.28)	0.01 (−0.01 to 0.02)	0.01 (−0.01 to 0.04)	0.00 (−0.00 to 0.00)	−0.00 (−0.01 to 0.02)	−0.00 (−0.00 to 0.00)
Racial/ethnic differences in change (reference group is NH white)						
NH blacks	−0.27 (−0.67 to 0.12)	−0.02 (−0.04 to 0.01)	−0.00 (−0.05 to 0.04)	−0.00 (−0.00 to 0.00)	0.01 (−0.02 to 0.03)	0.00 (−0.00 to 0.00)
Hispanics	−0.55 (−0.81 to −0.28)	−0.05 (−0.07 to −0.03)	−0.01 (−0.04 to 0.03)	−0.00 (−0.00 to 0.00)	−0.01 (−0.03 to 0.01)	−0.00 (−0.00 to 0.00)
NH Asians	−0.25 (−0.68 to 0.17)	−0.02 (−0.04 to 0.01)	−0.01 (−0.04 to 0.02)	−0.00 (−0.00 to 0.00)	−0.01 (−0.02 to 0.01)	−0.00 (−0.00 to 0.00)
NH others	0.13 (−0.91 to 1.18)	0.02 (−0.06 to 0.10)	0.02 (−0.03 to 0.08)	0.00 (−0.00 to 0.01)	−0.02 (−0.09 to 0.05)	−0.00 (−0.00 to 0.01)

Abbreviations: CI, confidence interval; NH, non-Hispanic; SDQ, Strengths and Difficulties Questionnaire.

[a] Racial/ethnic differences in change are derived from interactions between race and time variables (long period or survey year), in which NH white is the reference group.

[b] The SDQ has the following 5 items that are coded to reflect increasing severity of problems with the rising score (1-10): whether in the past 6 months, the child (1) was well behaved and obedient, (2) has many worries, (3) is often unhappy or depressed, (4) gets along better with adults than children, and (5) has good attention span/completes homework or chores.

[c] Long period change for the SDQ score should be interpreted as the difference between means of the outcome for pooled 3 years of data at both end points of the study period, that is, 2003-2005 and 2016-2018.

[d] SDQ items were not administered by the National Center for Health Statistics in 2008 and 2009 due to funding constraints.

[e] Coefficients for binary outcomes should be interpreted as change in probability of outcome in terms of percentage points.

[f] Children were considered as having parents in their midlives if at least one parent was between 45 and 55 years old.

[g] In 2 parent families, the education level of the more educated parent was high school or less.
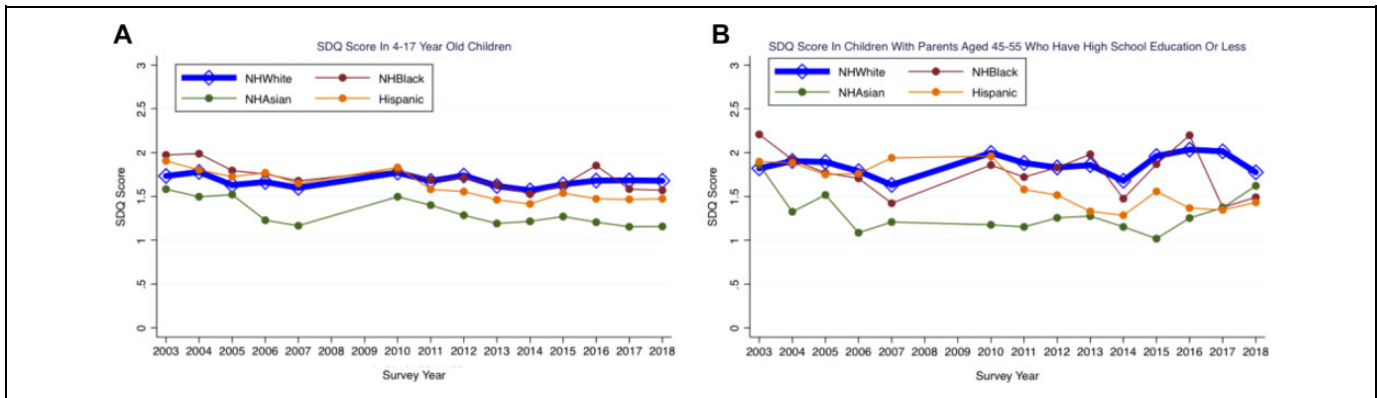
Figure 1. Trends in Strengths and Difficulties Questionnaire (SDQ) score in children by race/ethnicity. Trends in SDQ score in 4- to 17-year-old children (A) and in 4- to 17-year-old children of parents aged between 45 and 55 who have education of high school or less (B).

children of other racial/ethnic groups, using the National Health Interview Survey (NHIS).

Methods

National Health Interview Survey is fielded annually to a nationally representative sample of the noninstitutionalized population of the United States and uses a face-to-face interviewing technique that is widely acknowledged as a gold standard in survey methodology. The survey regularly yields high response rates that vary between 90% and 95%. The author pooled data on the child samples from 2003 to 2018 and dropped observations for children aged <4 and observations that were missing information on the key outcome variables. The base analytic sample consisted of 137 465 children between ages 4 and 17, of whom 68 057 (49.5%) were NHW. The author generated estimates of long period (ie, between 2003-2005 and 2016-2018) and annual change for 2 variables that captured mental well-being: the brief *Strength and Diffi-culties Questionnaire* (SDQ) score (a composite of 5 items capturing distinct facets of mental health, coded as a discrete variable with range 0-10) and a dichotomized variable that measured severe impairment in one or more aspects of a key mental function (ie, emotion, concentration, behavior, or getting along with others). Assessment of child mental health is challenging: The range of normal behavior is unusually large, and the clinical assessment field lacks instruments with sufficient cross-validation needed to provide replicable estimates of the prevalence of mental illness.[4] Tracking mental health trends requires a standardized, validated scale with sufficient consistency in its content and administration to allow comparability between population groups and over time. The author used the brief version of SDQ because it has been administered to a nationally representative sample of children consistently over the last 2 decades.[5] Widely used to screen children for mental health problems and regularly cited in federal reports on child mental health, the brief SDQ scale has high validity in predicting later mental service use.[5-8] In addition to mental well-being, the author assessed respondents' subjective perception of their overall health with a binary variable indicating

whether respondents felt their health was worse than before. Subjective global assessments of health are strongly predictive of more objective measures of physical and mental health, mortality, and even health-care utilization.[9] The author ran *linear* regressions to compare *unadjusted* trends in NHWs to other major race/ethnic groups overall and after stratifying for parental age and parental education. The key estimates were coefficients on a set of interactions between separate indicator variables for each race/ethnic group and a discrete survey year or a binary long period variable. Survey years flanking the study period were combined into 3-year bins to increase the precision and the stability of the long period estimates (1 = 2016-2018, 0 = 2003-2005). Regression coefficients for models that have SDQ scores as outcomes should be interpreted as the actual change in SDQ scores, while those for binary outcomes (ie, severe impairment of a mental function or decline in self-rated health) should be viewed as changes in the marginal probability of the negative outcome. The author used linear regression for SDQ scores (instead of Poisson or negative binomial models) and linear probability model for binary outcomes (instead of logistic regression) as the primary approach for several reasons. First, although SDQ scores are measured as discrete integers, they are difficult to interpret as "counts," since they do not signify events occurring over time for which the count models are clearly appropriate.[10] Second, linear regression coefficients yield a more straightforward interpretation (absolute change in scores for SDQ and changes in marginal probability for binary outcomes) than those with count or logistic models (ie, percentage change in incidence rate or odds, respectively).[11] Third, linear probability model is well known and widely used for binary outcome variables in the econometrics literature of health and health policy evaluation and yields reliable estimates if certain basic assumptions are met.[12] Since this study aims to describe raw trends in racial/ethnic groups, it is appropriate to use unadjusted analyses.[1] However, to account for the possibility of bias due to both misspecification and differences in the demographic composition of race/ethnic samples, the author tested the sensitivity of all estimates by running negative binomial

Table 2. Age- and Sex-Adjusted Long Period and Annual Change in Key Indicators Well-Being Among NH White Children Aged 4 to 17 Years, Along With Differences From Similar Trends Among Other Major Race/Ethnic Groups.[a,b]

Study Group	SDQ Score (Range 0-10)[c,d,e,f]		Severe Difficulties With Emotion, Behavior, Concentration, or Getting Along[g,h] (Range 0-1)		Health Worse Than Before[g] (Range 0-1)	
	Change Since 2003-2005 (95% CI)	Annual Change (95% CI)	Change Since 2003-2005 (95% CI)	Annual Change (95% CI)	Change Since 2003-2005 (95% CI)	Annual Change (95% CI)
All children	N = 26 403, 2003-2005 mean = 1.71	N = 59 852, mean = 1.68	N = 26 798, 2003-2005 mean = 0.05	N = 67 466, mean = 0.06	N = 27 057, 2003-2005 mean = 0.02	N = 68 057, mean = 0.01
Change in NH whites	−2.0 (−5.0 to 2.0)	0.0 (0.0 to 0.0)	17.0 (−3.0 to 33.0)	1.0 (0.0 to 2.0)	−39.0 (−53.0 to −22.0)	−4.0 (−5.0 to −3.0)
Racial/ethnic differences in change (reference group is NH white)						
NH blacks	−11.0 (−17.0 to −4.0)	−1.0 (−1.0 to 0.0)	0.0 (−25.0 to 35.0)	0.0 (−2.0 to 2.0)	70.0 (−2.0 to 196.0)	3.0 (−1.0 to 7.0)
Hispanics	−17.0 (−22.0 to −12.0)	−2.0 (−2.0 to −1.0)	−1.0 (−23.0 to 26.0)	0.0 (−1.0 to 2.0)	−21.0 (−59.0 to 24.0)	−2.0 (−4.0 to 1.0)
NH Asians	−22.0 (−30.0 to −13.0)	−1.0 (−2.0 to −1.0)	−47.0 (−76.0 to 17.0)	−3.0 (−7.0 to 1.0)	113.0 (−17.0 to 444.0)	4.0 (−3.0 to 12.0)
NH others	−17.0 (−33.0 to 2.0)	−1.0 (−2.0 to 1.0)	−35.0 (−59.0 to 349.0)	1.0 (−5.0 to 7.0)	−92.0 (−99.0 to −45.0)	−7.0 (−18.0 to 5.0)
Children with parents aged 45-55[i]	N = 9487, 2003-2005 mean = 1.63	N = 21 997, mean = 1.57	N = 9625, 2003-2005 mean = 0.05	N = 24 969, mean = 0.05	N = 9711, 2003-2005 mean = 0.02	N = 25 190, mean = 0.02
Change in NH whites	−4.0 (−9.0 to 2.0)	0.0 (−1.0 to 0.0)	10.0 (−8.0 to 31.0)	1.0 (−1.0 to 2.0)	−31.0 (−54.0 to 3.0)	−3.0 (−6.0 to 1.0)
Racial/ethnic differences in change (reference group is NH white)						
NH blacks	−11.0 (−26.0 to 7.0)	−1.0 (−2.0 to 0.0)	15.0 (−31.0 to 90.0)	0.0 (−3.0 to 3.0)	309.0 (38.0 to 1118.0)	11.0 (2.0 to 21.0)
Hispanics	−18.0 (−27.00 to −8.00)	−2.0 (−3.0 to −1.0)	41.0 (−6.0 to 114.0)	2.0 (−1.0 to 5.0)	−23.0 (−66.0 to 72.0)	−1.0 (−6.0 to 4.0)
NH Asians	−14.0 (−27.00 to 2.00)	−1.0 (−2.0 to 0.0)	−22.0 (−67.0 to 136.0)	1.0 (−5.0 to 8.0)	16.0 (−62.0 to 250.0)	0.0 (−8.0 to 9.0)
NH others	−7.0 (−40.00 to 45.00)	1.0 (−2.00 to 4.00)		5.0 (−4.0 to 14.0)	−90.0 (−99.0 to 45.0)	−4.0 (−19.0 to 15.0)
Children with parents aged 45-55 with high school or less education[j]	N = 2771, 2003-2005 mean = 1.88	N = 6638, mean = 1.86	N = 2855, 2003 to 2005 mean = 0.05	N =7677, mean = 0.05	N = 2858, 2003-2005 mean = 0.03	N = 7723, mean = 0.02
Change in NH whites	5.0 (−5.0 to 16.0)	0.0 (0.0 to 1.0)	47.0 (9.0 to 99.0)	3.0 (0.0 to 5.0)	8.0 (−42.0 to 101.0)	−1.0 (−5.0 to 4.0)
Racial/ethnic differences in change (reference group is NH white)						
NH blacks	−13.0 (−30.0 to 7.0)	−1.0 (−2.0 to 0.0)	7.0 (−46.0 to 111.0)	−2.0 (−6.0 to 2.0)	42.0 (−66.0 to 482.0)	3.0 (−7.0 to 15.0)
Hispanics	−28.0 (−38.0 to −16.0)	−3.0 (−4.0 to −2.0)	−17.0 (−52.0 to 46.0)	−1.0 (−5.0 to 2.0)	−41.0 (−78.0 to 61.0)	−3.0 (−10.0 to 4.0)
NH Asians	−15.0 (−36.0 to 13.0)	−1.0 (−3.0 to 1.0)	−11.0 (−86.0 to 455.0)	0.0 (−15.0 to 17.0)		−9.0 (−21.0 to 5.0)
NH others	−7.0 (−40.0 to 45.0)	1.0 (−4.0 to 6.0)		6.0 (−6.0 to 19.0)	−68.0 (−98.0 to 491.0)	3.0 (−18.0 to 30.0)

Abbreviations: CI, confidence interval; NH, non-Hispanic; SDQ, Strengths and Difficulties Questionnaire.

[a] acial/ethnic differences in change are derived from interactions between race and time variables (long period or survey year), in which NH white is the reference group.

[b] Blank space indicates that the regression yielded implausibly large and therefore unreliable estimate.

[c] The SDQ has the following 5 items that are coded to reflect increasing severity of problems with the rising score (1-10): whether in the past 6 months the child (1) was well behaved and obedient, (2) has many worries, (3) is often unhappy or depressed, (4) gets along better with adults than children, and (5) has good attention span/completes homework or chores.

[d] Regression results for the SDQ score should be interpreted as percentage change in the adjusted incident rate ratio and is calculated as $(x - 1) \times 100$, where x is the actual regression coefficient.

[e] Long period change for the SDQ score should be interpreted as the difference between means of the outcome for pooled 3 years of data at both end points of the study period, that is, 2003-2005 and 2016-2018.

[f] SDQ items were not administered by the National Center for Health Statistics in 2008 and 2009 due to funding constraints.

[g] Regression results for the binary outcomes should be interpreted as percentage change in adjusted odds ratio and is calculated as $(x - 1) \times 100$, where x is the actual regression coefficient.

[h] All regressions are population weighted except those for severe mental impairment in children with midlife parents and with midlife parents who had low education. For these, the weighted regression models failed to converge and were substituted by nonweighted regressions.

[i] Children were considered as having parents in their midlives if at least 1 parent was between 45 and 55 years old.

[j] In 2 parent families, the education level of the more educated parent was high school or less.

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regressions for SDQ scores and logistic regressions for severe impairment of mental function and perceived change in self-rated health, after adjustments for age and sex. Nonlinear or limited dependent regression models (which include negative binomial regression and logistic regression) fully accommodate nonlinear relationships between outcomes and predictors and, unlike linear regression, do not assume a particular form of distribution of error term (ie, normal), allowing these models to account for potential nonlinearities in child mental health trends.[11] The author used the negative binomial model (instead of the Poisson model) to allow for overdispersion in the distribution of SDQ scores. The author adjusted all regressions for the complex, multistage sampling design, using the svyset command in Stata version 15 along with the design variables and population weights provided by the NHIS.[13]

Results

Non-Hispanic white children showed no significant change in the composite SDQ 5-item score over both long period (-0.03, 95% confidence interval [CI]: -0.09 to 0.02, mean: 1.71) and annually (-0.00, 95% CI: -0.01 to 0.00, mean: 1.68; Table 1). The author's primary analyses did not detect any gradient of worsening trends with parental midlife status and low parental education: The long period changes were not significantly different from zero for children whose parents were in their midlives, that is, 45 to 55 (-0.06, 95% CI: -0.15 to 0.03, mean: 1.63) and whose midlife parents only had a high school or less education (0.09, 95% CI: -0.10 to 0.28, mean: 1.88; Figure 1). Overall, the trends in NHW children were worse than those for children of all other major race/ethnic groups (NH blacks: -0.22, 95% CI: -0.34 to -0.09; Hispanics: -0.31, 95% CI: -0.40 to -0.21; NH Asians: -0.32, 95% CI: -0.48 to -0.17; NH others: -0.36, 95% CI: -0.80 to 0.08), all of whom (with the exception of NH others) showed significant declines in SDQ scores. However, these differences in trends did not intensify after stratifying for children whose parents were in their midlives and had only high school education: In this group, the differential trends for *only* Hispanic children were significantly better than those for NHW children (NH blacks -0.27, 95% CI: -0.67 to 0.12; Hispanics: -0.55, 95% CI: -0.81 to -0.28; NH Asians: -0.25, 95% CI: -0.68 to 0.17; NH others: 0.13, 95% CI: -0.91 to 1.18). Moreover, the author did not find any significant change over time or any racial/ethnic differences in trends for severe impairment in mental function (NHW: 0.01, 95% CI: 0.00 to 0.02, mean: 0.05) or for rating current health as worse than in the past (NHW: -0.01, 95% CI: -0.01 to -0.00, mean: 0.02). The results of the sensitivity analyses are presented in Table 2. The author finds the primary estimates to be robust to specification and adjustments for age and sex, with the exception of severe mental impairment in which the trends were significantly worse for NHW children of less educated midlife parents than those for NHW children overall.

Discussion

The author reports stable levels of SDQ 5-item score for 4- to 17-year-old NHW children (including those with midlife parents with low education) between 2003 and 2018, signifying no decline (or improvement) on a key indicator of children's mental well-being. Given sharp increases in mortality and morbidity related to mental despair (eg, suicide, opioid addiction, alcoholism) in midlife NHW[1,14] and the profound effect of parental mental health on children's mental well-being, the stability of trends is reassuring. Lack of strong adverse trends in other tracked measures is also reassuring. Although flat trends in NHWs stood somewhat in contrast to consistent declines in SDQ scores seen in all other major racial/ethnic groups (indicating sustained improvement in mental well-being), the overall pattern of findings do not suggest a meaningful divergence in SDQ scores between NHWs and other groups, making it difficult to infer whether these trends portend a more persistent stall in mental well-being of NHWs. However, the finding that the likelihood of severe mental impairment in NHW children increases significantly with parental midlife status and low education is notable and bears close watching. This study tracked a limited set of indicators. Future studies should examine a broader set of indicators of mental well-being in NHW children and explore their relationship to parental health more fully. Moreover, the brief SDQ questionnaire has limited utility for tracking the full spectrum of child mental health or for evaluating individual mental health disorders; it is best viewed as an approximate indicator of mental health and the need for mental health-care services. Finally, the study's descriptive design and focus on aggregate statistical trends preclude attribution of any differences between trends in mental well-being of NHW children and other race/ethnic groups specifically to increase mental despair in NHW parents. Future studies could explore the potential reasons for these differences more directly, for example, by focusing on children of NHW who have clear history of mental despair linked to alcoholism or opioid addiction.

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Author Biography

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