



Original article

## Positive Youth, Healthy Adults: Does Positive Well-being in Adolescence Predict Better Perceived Health and Fewer Risky Health Behaviors in Young Adulthood?

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### A B S T R A C T

**Purpose:** To examine the prospective, longitudinal associations between positive well-being during adolescence and health outcomes in young adulthood, using a large, nationally representative sample of youth.

**Methods:** On the basis of the data from the first three waves of the National Longitudinal Study of Adolescent Health, we examined positive well-being during adolescence (averaged across Waves I–II) as a predictor of perceived young adult general health and risky health behaviors (Wave III). Each model included a full set of health and demographic baseline covariates. Missing values were assigned using multiple imputation methods ( $n = 10,147$ ).

**Results:** Positive well-being during adolescence was significantly associated with reporting better perceived general health during young adulthood, independent of depressive symptoms. Positive well-being was also significantly associated with fewer risky health behaviors in Wave III, after adding all covariates, including depressive symptoms and baseline risky health behaviors.

**Conclusion:** Few studies of adolescent health have examined positive psychological characteristics, tending to focus instead on the effect of negative mood states and cognitions on health. This study demonstrates that positive well-being during adolescence predicts better perceived general health and fewer risky health behaviors during young adulthood. Aligned with the goals of the positive youth development perspective, promoting and nurturing positive well-being during the transition from childhood to adolescence may present a promising way to improve long-term health.

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The past few decades have witnessed significant advances toward an integrative approach to studying health and development. Behavioral, psychological, and social processes are fundamental to a comprehensive understanding of health, disease resistance, and wellness [1]. Scholars have identified multiple determinants of health across the lifespan, including genetics,

health behaviors, access to health care, and social factors such as personal ties, socioeconomic inequality, and community influences [2]. However, one determinant of health that remains understudied is positive well-being, a construct that encompasses positive emotions and expectations for the future, perceived social acceptance, and high self-esteem [3–5].

#### *Pathways From Positive Well-being to Good Health*

Over the past decade, researchers have found important associations between positive well-being and improved immune, cardiovascular, and neuroendocrine functioning, superior cogni-

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tive performance, and longevity [4–8]. It appears that happiness, positive emotions, and self-esteem might play a key role in stress biology, reducing the activation of the hypothalamic-pituitary-adrenal axis and increasing the cellular immune competence [3–5]. Another possible pathway stems from Fredrickson's broaden-and-build theory, which suggests that positive emotions broaden people's thoughts, actions, and behaviors, whereas negative states heighten people's autonomic activity and narrow their attention [7]. Indeed, neuropsychological evidence suggests that positive affect is associated with broad, flexible, creative, and efficient patterns of thought; effects linked to increases in brain dopamine levels [9].

Other studies have found that positive well-being may help to enhance healthy outcomes through social and behavioral pathways [10]. Cross-sectional evidence has shown that positive well-being is associated with fewer health-compromising and risky behaviors, more physical activity, and better sleep quality [4,5,11]. Positive well-being may also have indirect effects on health through social mechanisms because happy individuals have more friends, more social support, and better interpersonal relationships [4], all of which have positive implications for health [12].

Despite the growing interest in positive health, few studies have examined the long-term effects of positive well-being. Additionally, almost all studies to date have focused exclusively on middle-aged and elderly adult populations, where disease and mortality rates are the highest. The goal of the present study is to examine the prospective, longitudinal associations between positive well-being during adolescence and health outcomes in young adulthood, using a large, nationally representative sample of youth.

### *Positive Well-being in Adolescence*

Although positive well-being has potentially important implications across the lifespan, it may be a particularly salient factor for health trajectories from adolescence into young adulthood. For instance, developmental models of health, such as the Life Course Health Development framework [2], emphasize the role of risk and protective factors during developmental transitions and turning points [13,14]. Adolescence is a period of rapid developmental change, characterized by growing autonomy and increased involvement in one's own health through health-compromising or health-promoting behaviors [15]. During this important developmental transition, youth begin to choose their own environments and make their own decisions that will set trajectories for adult health and health behaviors. Thus, adolescence represents a sensitive developmental period in which psychological characteristics such as positive well-being may play a pivotal role in physical health.

Historically, the scientific study of adolescent development has defined this stage of life as "storm and stress," or as an ontogenetic disturbance of normative development [16,17]. In fact, until recently, positive well-being in adolescence was only discussed as the absence of negative or undesirable behaviors [18]. It was not until the 1990s, with the beginning of the positive youth development perspective, that a new vision emerged for discussing young people as resources to be developed, and not as problems to be managed [19]. Positive youth development programs foster healthy development by promoting positive qualities such as self-determination, bonding, prosocial involvement, optimism, self-efficacy, and positive identity [20]. The current

study seeks to contribute to this paradigm shift from deterrence to development [21] by examining the longitudinal health consequences of positive well-being.

### *Positive Well-being and Depressive Symptoms*

An examination of the association between positive well-being and health must address the role of depression and depressive symptoms. Is positive well-being a distinct dimension of psychological health or does it simply reflect the absence of depressive symptoms [22]? The latter view indicates well-being and ill-being as opposite ends of a bipolar continuum [23]. Therefore, the possibility that positive emotional states are associated with good health may be explained as merely the absence of negative affect or depression. However, research suggests that well-being (e.g., happiness, self-esteem, optimism) and ill-being (e.g., depression, anxiety, pessimism) are distinct dimensions of emotional functioning, and thus, positive well-being could provide health benefits independent of the negative outcomes associated with depression or depressive symptomatology [24]. Additionally, studies within the past decade have found that positive affect is associated with lower risk of illness and mortality, independent of the effects of negative affect [5,22].

Research on the long-term effects of positive well-being, particularly with child or adolescent samples, is sparse. Depressive symptoms have been linked to health problems in adolescent and young adult populations, including overall poor health, health-risk behaviors, obesity, asthma, diabetes, and other physical health problems [25–27]. However, none of these studies examined positive well-being as a contributing factor to health, leaving the literature ambiguous regarding the relative contributions of well-being and ill-being [22]. To examine the unique effects of positive well-being, this study will test whether positive well-being is associated with perceived general health and risky health behaviors, controlling for depressive symptoms.

### **Design and Method**

The data are drawn from the first three waves of the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative study of adolescents in the United States. The present study used a school-based design to select a stratified sample of 80 high schools (and feeder middle schools) with selection probability proportional to size. Wave I (1994–1995) included 20,745 adolescents (age: 11–20 years) and their parents. All adolescents in grades 7 through 11 in Wave I were targeted about 1 year later for the Wave II in-home interview ( $n = 14,738$ ). A third wave of data collection (Wave III) took place between 2000 and 2001 (age: 18–27 years), for all respondents from the Wave I in-home sample ( $n = 15,197$ ). A more detailed description of the Add Health survey design can be found elsewhere [28]. The final analytic sample for the current study ( $n = 10,147$ ) included those who participated in the in-home surveys in all three waves. This limited the sample to adolescents in grades 7–11 because students in grade 12 were not followed up in Wave II.

### *Measures*

*Outcome measures.* The dependent variables measured self-reported general health and health behaviors of the young adults in Wave III. General health was measured by a single question,

“In general, how is your health?” (1 = poor; 2 = fair; 3 = good; 4 = very good; 5 = excellent). To measure health-compromising behaviors, a risky health behavior index was created using young adults’ responses to the following six categories: low physical activity, fast food consumption, binge drinking, cigarette smoking, marijuana use, and other illicit drug use.

The variable for engagement in physical activity was created from seven questions asking about the frequency of various activities in the past week (e.g., cycling, dancing, team sports, running). Fast food consumption was measured as the number of days the respondent ate fast food in the past week. Cigarette smoking was measured by the number of days that a person smoked at least one cigarette over the past 30 days. Binge drinking was defined as consuming five or more drinks in a row. Respondents were asked how many days they participated in binge drinking over the past year. Responses in the lowest quartile for physical activity (one or fewer activities per week) and the highest quartiles for fast food ( $\geq 4$  meals per week), cigarette smoking ( $>20$  days per month), and binge drinking (more than once a month) each counted toward this risky health behavior index.

Respondents were also asked how many times during the past 30 days they used the following: marijuana; cocaine; crystal meth; other illegal drugs such as lysergic acid diethylamide, phencyclidine, ecstasy, mushrooms, inhalants, ice, heroin, or prescription medicines not prescribed for them. One or more uses of marijuana (22% of sample) and one or more uses of any other illegal drugs in the past 30 days (7% of sample), each contributed one count toward the risky health behavior index. The final risky health behavior index ranges from 0 (low risk) to 6 (high risk), based on the six categories described earlier in the text.

*Positive well-being.* This scale was created by taking a unit weighted average of the following 10 questions in each Wave I ( $\alpha = .849$ ) and Wave II ( $\alpha = .851$ ). Because these 10 questions have different response categories, the scale was constructed by using standardized values of each item. Four questions came from the Center for Epidemiologic Studies Depression (CES-D) Scale and asked about the following feelings experienced in the past week: happiness, enjoyment of life, felt just as good as other people, and hopefulness about the future (0 = never or rarely; 1 = sometimes; 2 = a lot of the time; 3 = most of the time). In past research, these four items have loaded onto a single positive affect factor [29], and have been used in other studies to measure positive affect/mood (e.g., happiness, enjoyment) as well as optimism and self-esteem [22].

The additional six questions asked respondents whether they have good qualities; have a lot to be proud of; like themselves as they are; always do things right; feel socially accepted; and feel loved and wanted (1 = strongly disagree to 5 = strongly agree). Most of these later items were adapted from the Rosenberg Self-Esteem Scale [30] and they have been used together in other Add Health studies to measure self-esteem or self-image [31,32]. In a series of principal component analyses (with varimax rotation), it was found that the positive well-being items (positive CES-D items and self-esteem items) and negative CES-D items factor separately, when the number of components is constrained to two. However, in an unconstrained model, we observed one factor for positive CES-D items, one factor for self-esteem items, and four factors for negative CES-D items (representing different subtypes of depressive symptoms). Thus, we also examined the independent contributions of the positive affect subscale (four items;  $\alpha = .725$ ) and the self-esteem subscale (six items;  $\alpha = .855$ ).

*Health and demographic covariates.* The remaining CES-D items were used to create the depressive symptoms scale, a unit-weighted average of the following feelings experienced in the past week: felt blue; bothered by things that do not usually bother you; frequent crying; felt depressed, had trouble keeping mind on things; did not enjoy life; did not feel just as good as other people; felt disliked by people; felt sad; and felt too tired to do things (Wave I,  $\alpha = .861$ ; Wave II,  $\alpha = .863$ ). As expected, the positive well-being and depression scales were significantly negatively correlated ( $r = -.553, p < .001$ ).

We also included a number of pre-existing physical and mental conditions measured at Wave I in all analyses, including self-reported general health (1 = poor; 2 = fair; 3 = good; 4 = very good; 5 = excellent), body mass index quartiles, a count (0–14) of nonspecific somatic symptoms experienced at least once per week (e.g., headaches, fatigue, stomach aches, pain in muscles or joints), and several binary indicators for diagnosis of asthma, heart problems, and physical limitations, as self-reported in Wave I. The analyses also include parents’ self-reports of obesity (yes/no) and all risky health behaviors at baseline (Table 1). Additionally, basic demographic data were dummy-coded and included as covariates: age, gender, race/ethnicity, parental marital status (two biological parents; two parents, one biological; single mother; single father; other), and mean parental education (less than high school; high school graduate/General Equivalency Degree; some college; college graduate; and post-graduate). Finally, we included a binary measure for health insurance and a continuous measure of neighborhood socioeconomic status (proportion of families living below the poverty line).

#### Analytic strategy

The general analytic strategy was to investigate young adult perceived general health and risky health behaviors (Wave III) as a function of positive well-being during adolescence (averaged across Waves I–II), covarying for depressive symptoms (also averaged across Waves I–II), and a wide range of baseline variables at Wave I. Because causality between positive well-being and health goes in both directions and the effects accumulate over a long period, prospective studies are best suited for investigating the linkage between well-being and health outcomes [33].

Analyses were conducted in Stata 11.0 (StataCorp, College Station, TX) using survey procedures and appropriate Add Health longitudinal sampling weights, which adjust for the complex cluster sample design, unequal probability of selection, and non-response [34]. Missing values on all variables were assigned using multiple imputation methods (with multivariate normal regression to impute multiple variables simultaneously). All independent variables, outcome variables, strata, and sampling weights were used as predictors in the imputation process [35]. For all categorical variables, missing values were assigned to the category with the highest imputed value [35]. A total of five imputations were used to obtain final estimates. In all analyses, continuous covariates were standardized and all coefficients were converted into odds ratios (ORs) for interpretation.

Both outcomes were originally modeled using ordinal logistic regression based on a five-level general health variable (excellent; very good; good; fair; poor) and a five-level risky health behavior index (0; 1; 2; 3; 4 or more risky health behaviors) (This variable was truncated at “4 or more risky health behaviors” because of the small number of responses of 5 [ $n = 123$ ] or 6 [ $n = 20$ ] in the sample.) However, since both of

**Table 1**  
Weighted descriptive statistics for outcomes, positive well-being, and key covariates (n = 10,147)

Predictor variable	Mean	SD	Minimum	Maximum
<b>Outcome variables (Wave III)</b>				
Perceived general health	3.989	.866	1	5
Risky health behavior index	1.375	1.236	0	6
Physical activity in past week	5.968	6.211	0	49
Fast food meals in past week	2.483	2.090	0	7
Binge drinking in past year	29.615	54.728	0	356
Number of days smoked in past 30 days	8.834	13.100	0	30
Marijuana use in past 30 days	3.477	9.749	0	60
Hard drug use in past 30 days	.517	3.256	0	60
<b>Positive well-being (average Waves I–II)</b>				
Good qualities	4.298	.541	1.5	5
Do right	3.823	.732	1	5
Feel socially accepted	4.128	.632	1	5
Feel loved	4.326	.589	1	5
Proud	4.334	.589	1	5
Like self	4.046	.810	1	5
Feel just as good as others	1.955	.823	0	3
Hopeful	1.830	.795	0	3
Happy	2.150	.657	0	3
Enjoy life	2.246	.698	0	3
<b>Depressive symptoms scale (average Waves I–II)</b>				
Bothered	.491	.545	0	3
No appetite	.457	.571	0	3
Blue	.374	.556	0	3
Distracted	.811	.653	0	3
Depressed	.485	.611	0	3
Too tired to do anything	.724	.600	0	3
Failure	.190	.410	0	3
Fearful	.355	.572	0	7
Talk less	.550	.560	0	3
Lonely	.425	.554	0	3
Others seem unfriendly	.408	.497	0	3
Sad	.548	.553	0	3
Felt disliked by others	.398	.510	0	3
Frequently cry	.434	.582	0	4
Hard time starting things	.621	.558	0	3
Life is not worth living	.141	.371	0	3
<b>Demographic controls (Wave I)</b>				
Age	14.934	1.542	11	20
Grade	8.932	1.397	7	11
Male	.503	.498	0	1
White	.677	.466	0	1
Parents' average education (years)	12.961	2.619	6	18
Proportion of poor families in neighborhood	.120	.129	0	.859
<b>Baseline health controls (Wave I)</b>				
Perceived general health	3.887	.899	1	5
Body mass index (BMI)	22.228	4.497	11.478	56.378
Risky health behavior index	1.213	1.246	0	6
Physical activity in past week	5.151	2.535	0	10.5
Fast food meals in past week	2.145	1.759	0	7
Binge drinking in past year	10.456	44.861	0	365
Number of days smoked in past 30 days	3.910	9.088	0	30
Number of marijuana uses in past 30 days	1.246	5.984	0	60
Number of hard drug uses in past 30 days	.484	4.037	0	60

these ordered logit models violated the proportional odds assumption (Ordinal logistic regression assumes that the coefficients that describe the relationship between each pair of outcome groups are the same.), we ran a series of logit models to capture the differential effects of positive well-being on levels of perceived general health and number of risky health behaviors. Consistent with the past research [36], most young adults in our sample were healthy; thus, we focused on the top category of general health for our analyses (i.e., excellent perceived health as compared with very good, good, fair, or poor health).

## Results

### Descriptive statistics

On average, participants rated their health to be very good in both Wave I (mean = 3.887, SD = .899) and Wave III (mean = 3.989, SD = .866). Youth reported, on average, 1.213 (SD = 1.246) risky health behaviors in Wave I and 1.375 (SD = 1.236) risky health behaviors in Wave III. Table 1 presents descriptive statistics for the positive well-being and depressive symptom variables, as well as several baseline health and demographic covariates.

**Table 2**

Logistic regressions predicting perceived general health at Wave III from positive well-being, depressive symptoms, and baseline covariates, reported in odds ratios (n = 10,147)

Predictor variable	Perceived excellent general health WIII (as compared with all lower categories combined: very good, good, fair, poor)			
	Model 1	Model 2	Model 3	Model 4
Positive well-being scale (WI–II)	1.297***			
Positive affect subscale		1.277***		1.251***
Self-esteem subscale			1.151***	1.062
Depressive symptoms scale (WI–II)	.919***	.894***	.873***	.917**
Perceived general health WI (very good) <sup>a</sup>				
Excellent health	2.255***	2.276***	2.410***	2.273***
Good health	.643***	.639***	.622***	.636***
Fair health	.469***	.454***	.439***	.460***
Poor health	.330	.341	.304	.342
Risky health behaviors WI				
Physical activity	.918**	.932**	.937*	.927**
Fast food	.967	.975	.979	.975
Binge drink	1.049	1.033	1.035	1.03
Smoke	.935	.937	.937	.940
Marijuana	.984	.991	.989	.989
Hard drugs	.981	.987	.982	.987
Health controls WI				
Symptom count	.956	.961	.962	.959
Cardiac abnormality	.081**	.086***	.080***	.085***
Asthma	.907	.938	.944	.936
Physical limitation/disability	.635*	.634*	.634*	.613*
Body mass index (BMI; 1st quartile) <sup>a</sup>				
BMI 2nd quartile	1.142	1.166*	1.144*	1.159*
BMI 3rd quartile	.960	1.022	1.010	1.021
BMI 4th quartile	.712***	.742***	.730***	.741***
Parent(s) with obesity	.919	.898	.909	.899
Health insurance	1.108	1.134	1.152	1.135
Other WI controls				
Gender (1 = male)	1.287***	1.268***	1.315***	1.279***
Race/ethnicity (white) <sup>a</sup>				
Black	1.186*	1.183*	1.282***	1.196***
Native American	1.726**	1.854**	1.794**	1.857**
Asian	.826	.849	.852	.857
Hispanic	1.262**	1.249**	1.264**	1.262**
Other race	1.408	1.345	1.445	1.356
Parents mean education level (high school) <sup>a</sup>				
Less than high school	1.064	1.044	1.077	1.069
Some college	.991	1.003	.989	1.002
College	1.059	1.083	1.059	1.080
More than college	1.355***	1.391***	1.327***	1.370***

Also controlling for age, neighborhood poverty, and family structure.

<sup>a</sup> Reference group in parenthesis.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

*Outcome 1: Perceived general health*

Table 2 shows the results from a logistic regression examining the association between positive well-being and perceived general health. Positive well-being during adolescence (Wave I–II) was significantly associated with reporting excellent health during young adulthood (Wave III). For a one standard deviation increase in the positive well-being scale, we observed the odds of reporting excellent general health versus all lower categories (very good/good/fair/poor health) combined to be 30% greater, covarying for the effects of depressive symptoms, baseline health, and demographic characteristics (OR = 1.297,  $p < .001$ ). Depressive symptoms were significantly associated with reduced odds in reporting excellent health. For a one standard deviation increase in the depressive symptom scale, the odds of reporting excellent health in Wave III was 8% less than all lower categories of general health combined, after adding covariates (OR = .919,  $p < .001$ ).

A higher score on each of the positive affect (Model 2) and self-esteem (Model 3) subscales was significantly associated with better perceived general health in Wave III when analyzed separately, following the same trends as the positive well-being scale, with smaller effect sizes. However, when examined in the models together (Model 4), only the positive affect subscale predicts reporting excellent health as compared with all lower categories of general health (OR = 1.251,  $p < .001$ ).

*Outcome 2: Risky health behavior index*

Positive well-being was also significantly associated with reporting fewer risky health behaviors in Wave III. For a one standard deviation increase in the positive well-being score, we observed the odds of reporting four or more risky health behaviors versus all lower categories combined (three or fewer risky behaviors) to be 17% lower, covarying for baseline risky health behaviors and the full set of covariates (OR = .833,

**Table 3**

Serial logit regressions predicting risky health behaviors at Wave III from positive well-being, depressive symptoms, and baseline covariates, reported in odds ratios ( $n = 10,147$ )

Predictor variable	Risky health behavior index WIII (vs. all lower levels on the index)			
	Four or more risky health behaviors	Three or more risky health behaviors	Two or more risky health behaviors	One or more risky health behaviors
Positive well-being scale (WI-II)	.833***	.859***	.870***	.904**
Depressive symptoms scale (WI-II)	.903	.928	.998	1.040
Perceived general health WI (very good) <sup>a</sup>				
Excellent health	.887	.801**	.880*	.857**
Good health	1.113	.981	.956	1.069
Fair health	.891	.838	.773*	.975
Poor health	.828	.772	.771	1.078
Risky health behaviors WI				
Physical activity	.962	1.007	.981	.948
Fast food	1.055	1.135***	1.164***	1.208***
Binge drink	1.042	1.017	1.071**	1.027
Smoke	1.322***	1.436***	1.551***	1.646***
Marijuana	1.253***	1.212***	1.215***	1.154**
Hard drugs	.950	.955	.907**	.914**
Health controls WI				
Symptom count	1.127	1.112***	1.057	1.023
Cardiac abnormality	1.159***	.504	.816	3.762
Asthma	.987	.977	.998	.988
Physical limitation/disability	.833	.695	.964	1.007
Body mass index (1st quartile) <sup>a</sup>				
BMI 2nd quartile	.991	.857	.926	.881
BMI 3rd quartile	.888	.841***	.933	.798**
BMI 4th quartile	1.044	.852	.987	.787***
Parent(s) with obesity	.822	.841***	.861**	.937
Health insurance	1.170	1.008	1.017	1.081
Other WI controls				
Gender (1 = male)	1.932***	1.963***	1.964***	1.805***
Race/ethnicity (white) <sup>a</sup>				
Black	.312***	.483***	.678	.973
Native American	.592	.754	.624	.870
Asian	.244***	.493***	.460***	.657***
Hispanic	.564***	.551***	.559***	.680***
Other race	.744	.635	.703	.992
Parents mean education level (high school) <sup>a</sup>				
Less than high school	.797	.991	.866	.918
Some college	1.274	1.273**	.995	.927
College	1.214	1.241*	1.058	.908
More than college	.890	.929	.914	.752

Also controlling for age, neighborhood poverty, and family structure.

<sup>a</sup> Reference group in parenthesis.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

$p < .001$ ). Similar effect sizes were reported across all models, as seen in Table 3. Additional analyses examining the positive affect and self-esteem subscales show that the positive affect subscale predicted fewer risky health behaviors across all levels of the risky health behavior index (see Table 4). However, the self-esteem subscale and the depressive symptoms scale were not associated with risky health behaviors at Wave III.

Many demographic variables, including gender, age, and race, were also significantly related to young adults' participation in risky health behaviors, covarying for baseline levels of risky behaviors and all health and demographic covariates (see Tables 3 and 4). Males were more likely to participate in risky health behaviors than females, and participation in risky health behaviors appeared to increase linearly with age. Additionally, self-identified black, Asian, and Hispanic youth were

less likely to report more risky health behaviors, as compared with the white youth, holding all other covariates constant.

## Discussion

Despite the growing interest in positive health, this is the first study to examine the association between perceived health (and health behaviors) and both positive well-being and depressive symptoms in an adolescent sample. Because positive and negative states are inversely correlated, associations between positive well-being and health outcomes have sometimes been conceptualized as merely the absence of depression or negative affect. However, the majority of previous studies of depression or depressive symptoms and health rarely examine the potential effect of positive well-being [22], making it impossible to compare the relative significance of

**Table 4**

Serial logit regressions predicting risky health behaviors at Wave III from positive affect, self-esteem, depressive symptoms, and baseline covariates, reported in odds ratios (n = 10,147)

Predictor variable	Risky health behavior index WIII (vs. all lower levels on the index)			
	Four or more risky health behaviors	Three or more risky health behaviors	Two or more risky health behaviors	One or more risky health behaviors
Positive affect subscale	.809***	.892**	.893***	.916**
Self-esteem subscale	1.036	.961	.958	.990
Depressive symptoms scale (WI-II)	.930	.948	1.007	1.059
Perceived general health WI (very good) <sup>a</sup>				
Excellent health	.892**	.799**	.889	.877*
Good health	1.098	.944	.933	1.082
Fair health	.868	.836	.774*	.943
Poor health	.801	.799	.818	.938
Risky health behaviors WI				
Physical activity	.954	1.009	.480	.948
Fast food	1.050	1.142***	1.172***	1.225***
Binge drink	1.047	1.021	1.075***	1.037
Smoke	1.295***	1.429***	1.541***	1.643***
Marijuana	1.230***	1.205***	1.250***	1.218***
Hard drugs	.951	.956	.891***	.889**
Health controls WI				
Symptom count	1.155***	1.100**	1.043	1.014
Cardiac abnormality	.924	.921	.547	3.358
Asthma	.824	.974	1.006	.976
Physical limitation/disability	1.104	.727	1.032	.961
Body mass index (1st quartile) <sup>a</sup>				
BMI 2nd quartile	.976	.874	.916	.908
BMI 3rd quartile	.855	.860	.907	.723**
BMI 4th quartile	1.059	.874	.982	.798**
Parent(s) with obesity	.824	.841*	.849**	.954
Health insurance	1.093	.984	.995	1.040
Other WI controls				
Gender (1 = male)	1.996***	1.925**	1.964***	1.816***
Race/ethnicity (white) <sup>a</sup>				
Black	.284**	.473***	.706***	.957
Native American	.480	.648	.583	.808
Asian	.253***	.504***	.483***	.653***
Hispanic	.584**	.559**	.563***	.660***
Other race	.792	.654	.671	.966
Parents mean education level (high school) <sup>a</sup>				
Less than high school	.829	.975	.863*	.916
Some college	1.251	1.267*	1.002	.957
College	1.225	1.235*	1.027	.908
More than college	.836	.933	.910	.745***

Also controlling for age, neighborhood poverty, and family structure.

<sup>a</sup> Reference group in parenthesis.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

distinctive measures of well-being and ill-being. This study demonstrates that positive well-being during adolescence predicts good perceived general health and fewer risky health behaviors during young adulthood, independent of depressive symptoms. Furthermore, these analyses suggest that some positive characteristics (i.e., happiness, enjoyment of life, feeling just as good as other people, and hopefulness about the future) may have a stronger association with health outcomes than other characteristics (i.e., self-esteem).

Risky health behaviors represent a particularly important outcome to examine in a young adult population because it is estimated that 40% of premature deaths in the United States are related to health-compromising behaviors, with obesity, physical inactivity, and smoking identified as the most prevalent causes of mortality [37]. Although most health-intervention

programs target risky behaviors directly, new policy initiatives, including the newest iteration of *Healthy People* (2020), recommend an increased focus on positive youth development interventions for improving adolescent health as one of the key emerging issues for the next decade [38]. Indeed, the evidence presented in this study is well-aligned with the Positive Youth Development movement, and suggests that promoting and nurturing positive characteristics in families, schools, and after-school programs, may be a promising way to improve lifelong health.

*Limitations*

Although there are many benefits to using a nationally representative dataset such as Add Health, there are also several challenges and limitations, such as missing data. To address the

potential bias from sample attrition, we weighted the regression analyses using the in-school sampling weights to take care of poststratification issues. Additionally, we include a comprehensive set of potentially confounding baseline covariates in our models; however, we cannot account for biases associated with unmeasured characteristics that change between the baseline (Wave I) and final observations (Wave III). These characteristics could affect adolescents' positive well-being or depressive symptoms, as well as their health. Another limitation is that all study data were self-reported; thus, the estimation results are sensitive to mismeasurement or misreporting. The results from these models should be interpreted taking these limitations into consideration.

Until recently, the research on social and psychological influences on health only studied how negative feelings and experiences are linked to poor health; thus, most existing data has only limited information on positive psychological qualities. For this study, we constructed a positive well-being measure from two other scales (CES-D and Rosenberg Self-Esteem scale), based on statistical support that these variables are interrelated (e.g., high internal consistency) and theoretical underpinnings that these positive characteristics are jointly predictive of health [3–5]. More research is needed to understand how positive emotions and characteristics such as happiness, optimism, perceived social acceptance, and self-esteem relate to both perceived and diagnosed health conditions.

Despite these limitations, the present study strongly suggests that positive well-being during adolescence predicts good perceived general health in young adulthood and may serve to reduce multiple risky health behaviors, including fast food consumption, low physical activity, binge drinking, cigarette smoking, marijuana use, and other illicit drug use. Consequently, positive well-being could be a key psychological factor during adolescence to promote positive health and reduce risky behaviors that may lead to diseases later in life.

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