Ohio Journal of Public Health, Vol. 7, Issue 2 ISSN: 2578-6180

RESEARCH ARTICLE

Hopeful Future Expectations Post-COVID-19 Pandemic Among Youth

Miraides F. Brown[1,2]; Vinay K. Cheruvu[2]; Jonathan B. VanGeest[2]; Tarah C. Smith[2]; Diane L. Langkamp[1,3]; Nao Mimoto[1]

[1]University of Akron, Akron, OH
[2]College of Public Health, Kent State University, Kent, OH
[3]NeuroDevelopmental Science Center, Akron Children's Hospital, Akron, OH

Corresponding Author: Jonathan B. VanGeest, 750 Hilltop Drive, Kent, OH 44242, (330) 672-7148, jvangees@kent.edu

Submitted March 5, 2025 Accepted April 16, 2025 Published October 23, 2025 https://doi.org/10.18061/ojph.6412

ABSTRACT

Background: Future expectations have been identified as a strong predictor of positive youth development and behavior. Adolescents who anticipate a negative future are more likely to engage in problem behaviors like delinquency, substance use, and risky sexual behavior. The main purpose of this study was to evaluate hopeful future expectations (HFE) of adolescents and young adults (AYA) post COVID-19 pandemic.

Methods: An anonymous cross-sectional online survey was sent to AYA aged 16-21 years in 2022, living in Ohio. Hopeful future expectations, Revised Life Orientation Test (LOT-R), and the 2-item version of the Connor–Davidson Resilience Scale (CD-RISC2) were used to provide overall HFE, resilience, and dispositional optimism scores. Hierarchical clustering and regression models were employed.

Results: A 30% response rate was achieved (468 participants) with 69% (324) Caucasian/White and 51% (239) female. Prior diagnosis with a chronic disease was reported in 20% (96) of participants, and 16% (77) were former or current e-cigarette users. Three clusters were identified in the hierarchical analysis. The low HFE level contained 14.7% (62) of participants, while the moderate and high HFE levels contained 39.2% (166) and 46.8% (198) of participants, respectively. Regression analysis results indicated a collective significant effect of resilience, dispositional optimism, sex, participant educational level, religion, general health, e-cigarette use, and COVID-19 testing on HFE. At the end of the questionnaire, 32 participants provided comments on aspects of the COVID-19 pandemic that were not addressed in the survey.

Conclusion: Our findings provided HFE estimates among AYA, including minority groups, providing insights of the effect of a public health crisis on this population. The development of preventive programs and early interventions are warranted during a public health crisis. Cultural differences with respect to parenting and future orientation, participation in sport activities, mentorship, and social engagement in the local community may yield different levels of HFE

Keywords: Adolescents; Young adults; Hopeful future expectations; Resilience

INTRODUCTION

Adolescence is an intense period of development characterized by the sometimes challenging transition between childhood and adulthood. The intensity of development increases as youth begin to think about adulthood and future expectations.[1] The developmental task of building expectations for the future is especially complex for adolescents and young adults (AYA), even for those living within a society that provides considerable educational and professional opportunities. This period crystalizes during later phases of adolescence, as AYA engage in career exploration and prepare for transitions from school to college or the work

environment and attempt to establish more adult responsibilities.[2,3] This is a challenging developmental period, but one that is also susceptible to interruptions that potentially impact future growth trajectories.

Experiencing the impact caused by a public health crisis such as the recent COVID-19 pandemic is an example of an interruption that might have affected how young people feel about their future. However, our understanding of the impact of the COVID-19 pandemic is incomplete as research findings are limited. Data from the Global Survey on Youth and COVID-19 that interviewed 12 000 respondents from 112 countries indicated young people 18-29 years of age reported feeling optimistic about the future rarely or none of the time (31%), compared to respondents 30-34 years of age (26%).[4] Twenty percent of respondents were representatives of minority groups, however most of the survey results were only reported by gender and age group. Research in a few countries have reported low future expectations and worry about the future among adolescents during the pandemic period.[5-9]

Future expectations, or the extent to which one expects an event to occur, have been identified as strong predictors of positive youth development,[10] and important predictors of adolescent behavior.[11] Higher career aspirations, for example, are a marker for teenagers' well-being and self-efficacy. As observed by Dudovitz and colleagues, aspirations requiring high levels of education are associated with decreased odds of alcohol and substance use and decreased engagement in risky sexual behavior.[12] Conversely, adolescents who anticipate a negative future were more likely to engage in problem behaviors like delinquency, substance use, and risky sexual behavior.[13] Positive beliefs about the future represent an internalization of hope and optimism about future outcomes that manifest as a sequence of goal-associated thoughts and motivations that improve planning pathways, self-confidence, mastery, and goal-directed behavior.[14] They are also associated with better social and emotional outcomes such as adjustment at school[15] and lower depressive symptoms.[16]

In the literature, dispositional optimism is described as the predisposition to expect positive outcomes when confronting major problems across key life domains, resulting in expectations that goals will be attained even in the face of adversity.[17-20] Research has suggested that being optimistic is associated with having good future expectations as an essential factor in adaptation to traumatic or stressful situations.[21,22] For instance, dispositional optimism was linked to the judgment of positive and future life events among undergraduate students.[23] Recent research on optimism has highlighted the important role of optimism on the physical and mental health of AYA minorities,[24] and an important positive cognition associated with suicidal ideation for African American and Latino American college students.[25]

Several studies have shown a significant relationship between resilience and optimism.[26-28] Taken together, optimism and resilience can be seen as positive personality traits. The concept of resilience can be defined as the ability to adapt and cope successfully despite threatening or challenging situations.[29,30] According to Connor and Davidson, resilience varies with context, time, age, and gender.[31] Indeed, all youths experience numerous hardships such as change of school, physical illness, and change in family dynamics that provide opportunities to build personal resilience skills. In more extreme situations, some hardships can cause greater challenges and inhibit development.[32]

Many studies have identified the risks to adolescent mental health posed by the COVID-19 pandemic, yet future expectations in American population have not been sufficiently studied. The purpose of the present study is to investigate hopeful future expectations (HFE) in association with resilience and optimism among AYA during the COVID-19 pandemic. The study of HFE among AYA is essential to provide additional insights to enable future research to help AYA adapt to unparalleled crises and continue pursuing future career expectations when facing major life adversities. Whether dispositional optimism and resilience have a protective effect among AYA regarding future expectations during a pandemic is unknown.

METHODS

Participants

The included participants were AYA between 16-21 years of age who had at least one visit between January and December 2021 at any sites associated with a large children's hospital in Ohio. Any AYA unable to read English sufficiently to participate were excluded. The use of ICD-10 codes was implemented to identify and exclude potential participants with recorded information on developmental disabilities. Sample size calculations were based on the expectation that 30% of respondents would report high HFE. A total of 1646 survey invitations were mailed to a random selection of participants. The invitation letter was mailed with a link to the REDCap (Research Electronic Data Capture) survey, and, to enhance participant response, a $5 gift card claim code was included. Two reminder letters to encourage participation were sent about 2 weeks apart. Survey responses were collected between April and June 2022. The survey participation was anonymous. This study was approved by the Akron Children's Hospital institutional review board where this project was conducted.

Measures

The questionnaire was self-administered, comprised of a combination of multiple-choice questions, Likert scale questions, and open-ended questions. Questionnaire items were developed from literature, with many measures having established face validity. Nonetheless, the questionnaire was pretested to assess its readability and, based on the feedback from 6 participants, a few adjustments were made to the original questionnaire. Specific measures included HFE, Revised Life Orientation Test (LOT-R), and the 2-item version of the Connor–Davidson Resilience Scale (CD-RISC2).

Hopeful Future Expectations (HFE). This instrument was designed for the 4-H Study of Positive Youth Development[16] with a total of 12 items. The final scale score is a mean of the items in the scale, with a range of 1 to 5 where higher scores indicate higher expectations of the likelihood that certain future outcomes will occur. Cronbach α for the hopeful future scale are .94 and .95 for grades 7 and 8, respectively.[16] Under the assumption that many participants graduated from high school, 1 item was changed from 'what are your chances to graduate from high school?' to 'what are your chances to graduate from college?'

Revised Life Orientation Test (LOT-R) (optimism and pessimism scale). Total test score was calculated as per guidelines.[18] The LOT-R has been used to provide an overall dispositional optimism score. Research results indicate gender invariance in the LOT–R factor structure.[18] LOT-R has been used in youth populations as indicated in the literature.[33-36] The LOT-R includes 10 items with a 4-point Likert scale[18] (Cronbach α = 0.78).

Two-item version of the Connor–Davidson Resilience Scale (CD-RISC2). The CD-RISC2 is a brief, self-rated measure of resilience with sound psychometric properties.[37] Higher scores indicate higher resilience. It has been used in studies that included youth and adolescents.[38]

The questionnaire also assessed basic demographics, including age, gender, sex, race, ethnicity, religious affiliation, educational level, and a few questions related to general health.

Statistical Methods

Descriptive statistics for continuous variables (mean, standard deviation) and categorical variables (frequency, percentage) are provided. Group comparisons were assessed using *t* test or analysis of variance (ANOVA) for continuous data, and chi-square test or Fisher exact test for categorical data. To get an overview of the correlations between HFE, dispositional optimism, and reliance, Pearson correlation matrix was created. In the absence of cutoff scores for HFE, hierarchical clustering was employed in attempt to identify clusters of participants. Linear regression and ordinal regression models were evaluated and compared to determine the final model that best fits the sample data. Using regression models, it was investigated if resilience and optimism served as protective factors in the association with HFE, adjusting for demographic characteristics and covariates of interest. Analyses were performed in SAS version 9.4 and JMP Pro 14 (SAS Institute Inc.). Statistical significance was set at 5%.

Missing data were imputed using PROC STDIZE in SAS (SAS Institute Inc.). Imputation is recommended for handling missingness, rather than other missing data techniques (eg, listwise deletion), which significantly reduce sample size and potentially bias results.[39] A total of 427 participants answered the LOT-R questions. There were 11 participants with 1 missing value, and no missing pattern was identified. The HFE questions were answered by 428 participants. There were 6 participants with 1 missing value, 5 participants with 2 missing values, 1 participant with 3 missing values, and 1 participant with 4 missing values. No missing pattern was identified, and 426 were included in the missing imputation method. At the end of the questionnaire, 32 participants provided comments on aspects of the pandemic that were not addressed in the questionnaire.

RESULTS

A 30% (468 participants) response rate was achieved. This response rate is consistent with population- and hospital-based patient surveys generally, which typically range between 16% to 80%.[39-43] Most respondents were White (69%, 324) and non-Hispanic (81%, 378). Fifty-one percent were female (239), and 18% (86) self-identified as LGBTQ+ (Table 1). Prior diagnosis with a chronic disease was reported in 20% (96) of participants, and 16% (77) were former or current e-cigarette users.

Hopeful Future Expectations

A total of 19% (89 participants) responded that the COVID-19 pandemic had very much or completely affected how they perceived their future, and 12% (56 participants) stated their lives will never be the same. Mean (SD) HFE was 4.1 (0.7), with minimum and maximum values of 1.8 and 5 points. Participants that self-identified as male, LGBTQ+, and Hispanic reported lower HFE compared to their counterparts. A statistically significant difference in mean HFE score was also observed between participant educational level, parent educational level, religion, cigarette smoking status, e-cigarette use, chronic disease status, COVID-19 vaccine receipt, and perceived risk for severe COVID-19 (Table 2).

In the absence of guidelines to categorize levels of HFE, hierarchical clustering was used to identify clusters of participants with different levels of HFE. Three clusters were identified, which absorbed 86.4% of all variation in HFE scores. A 1-way ANOVA followed by Tukey HSD (honestly significant difference) pairwise test indicated statistically significant differences in the means of HFE between clusters ($p < .001$). The low HFE level contained 62 (14.7%) members, with a mean 3.0 (95% CI: 2.92;3.05), while the moderate and high HFE levels contained 166 (39.2%) and 198 (46.8%) members, with mean 3.82 (95% CI:3.78; 3.85) and 4.73 (95% CI:7.70; 4.77), respectively. Factors associated with HFE levels are shown in Table 3. The HFE level was associated with sexual orientation ($p = 0.0488$), 21% (18) of self-identified LGBTQ+ participants were in the low level of HFE, compared to 11% (33) among heterosexual participants. Levels of HFE were also associated with participant educational level ($p = 0.0002$), parental educational level ($p < .0001$), religion ($p < .0001$), general health ($p < .0001$), and e-cigarette use ($p = 0.0212$). Among participants with low level of HFE, 55% (34) had parents with high school or less education, 50% (31) did not identify with any religion, 19% (12) stated having fair/poor general health, and 29% (18) were former or current e-cigarette users. Although 27% (6) of Hispanic participants had low level of HFE, compared to

Table 1. Demographic Characteristics of Participants, n=468

	n or mean	% or SD
Age group (years)		
16-17	143	30.6
18-21	325	69.5
Sex		
Female	239	51.1
Male	158	33.8
No answer/Prefer not to answer	71	15.2
Sexual orientation		
Heterosexual or straight	301	64.3
LGBTQ+	86	18.4
No answer/Prefer not to answer	81	17.3
Race		
White	324	69.2
African American	33	7.1
Other race group	47	10.1
Prefer not to answer/no answer	64	13.7
Hispanic/Latino(a)		
No	378	80.8
Yes	22	4.7
Prefer not to answer/no answer	68	14.5
Participant highest degree or level of education		
Less than high school	145	31.0
High school graduate	160	34.2
Some college	90	19.2
College graduate or more	12	2.6
Prefer not to answer/no answer	61	13.0
Parents highest degree or level of education		
Less than high school	26	5.6
High school graduate	92	19.7
Some college	75	16.0
College graduate or higher	214	45.7
Prefer not to answer/no answer	61	13.0
General health		
Excellent	76	16.2
Very good	175	37.4
Good	111	23.7
Fair	41	8.8
Poor	5	1.1
Prefer not to answer/no answer	60	12.8
Have been told by a health care professional that I have any of the following chronic diseases[a]		
Pulmonary diseases (such as asthma, emphysema, chronic bronchitis, cystic fibrosis)	49	10.5
Heart condition (such as heart failure, coronary artery disease)	15	3.2
Chronic kidney disease	2	0.4
Diabetes	13	2.8
Sickle cell disease	0	0
Conditions that may weaken your immune system like bone marrow or organ transplant, HIV/AIDS	5	1.1
Cancer	1	0.2
Other	30	6.4
Prefer not to answer/no answer	82	17.5
I have not been told that I have a chronic disease	290	62.0
Have ever smoked cigarettes		
Never	374	79.9
Yes, I am a current smoker	12	2.6
Yes, I am a former smoker	19	4.1
Prefer not to answer/no answer	63	13.5
Have ever used e-cigarettes		
Never	326	69.7
Yes, I am a current user	44	9.4
Yes, I am a former user	33	7.1
Prefer not to answer/no answer	65	13.9
Identify themselves with any of the following religions		
Christianity	210	45.0
Other religion	27	5.8
Atheist/Agnostic/no religion	131	28.0
Prefer not to answer/no answer	100	21.4

[a] Some participants reported more than 1 chronic disease.

Table 2. Hopeful Future Expectation (HFE) Scores by Demographic Characteristics, General Health, Risk Perceptions, and COVID-19 History

	mean (SD)	median (IQR)	*p*
Age group (years)			0.476
16-17	4.2 (0.7)	4.2 (1.1)	
18-21	4.1 (0.7)	4.1 (1.0)	
Sex			0.032
Female	4.2 (0.7)	4.3 (1.1)	
Male	4.0 (0.7)	4.0 (1.0)	
LGBTQ+			0.017
No	4.2(0.7)	4.3 (1.1)	
Yes	4.0 (0.7)	4.0 (1.2)	
Race			0.134
Caucasian/White	4.1 (0.7)	4.2 (1.1)	
African American	4.1 (0.6)	4.3 (0.8)	
Other race	3.9 (0.8)	3.9 (1.3)	
Ethnicity			0.012
Non-Hispanic	4.1 (0.7)	4.2(1.0)	
Hispanic	3.8 (0.8)	3.8 (1.4)	
Participant educational level			<.0001
High school or less	4.0 (0.7)	4.0 (1.2)	
Some college or higher	4.4 (0.6)	4.5 (1.0)	
Parent educational level			<.0001
High school or less	3.9 (0.8)	3.8 (1.4)	
Some college or higher	4.2 (0.6)	4.3 (0.9)	
Religion			<.0001
No religion/Agnostic	3.9 (0.7)	3.8 (1.0)	
Christianity	4.3 (0.6)	4.4 (1.0)	
Other religion	3.8 (0.7)	3.7 (1.6)	
Cigarette smoker			0.026
Never	4.1 (0.7)	4.2 (1.0)	
Current smoker/former smoker	3.9 (0.8)	3.6 (1.5)	
E-cigarette user			0.005
Never	4.2 (0.7)	4.2 (1.0)	
Current user/former user	3.9 (0.7)	3.9 (1.3)	
General health			<.0001
Excellent/Very good/Good	4.2 (0.7)	4.3 (1.1)	
Fair/Poor	3.6 (0.6)	3.6 (0.9)	
Been told that I have a chronic disease			0.016
No	4.2 (0.7)	4.2 (1.2)	
Yes	4.0 (0.7)	4 (1.1)	
Chances that you will be infected in the next 3 months if you don't take any preventive measures (risk clusters)			0.844
Low	4.1 (0.7)	4.1 (1.1)	
Moderate	4.1 (0.7)	4.2 (1.0)	
High	4.2 (0.7)	4.3 (1.1)	
What would be your chances of developing severe COVID-19?			0.044
Low/very low	4.2 (0.6)	4.2 (1.1)	
Moderate	4.1 (0.8)	4.2 (1.5)	
Very high/high	3.9 (0.80	3.9 (1.1)	
In general, how severe you think COVID-19 disease is?			0.272
Not at all serious/slightly serious	4.0 (0.7)	4.1 (1.1)	
Moderately serious	4.1 (0.7)	4.1 (1.0)	
Severely serious	4.2 (0.7)	4.3 (1.1)	
Tested for COVID-19			0.099
Never tested	4.1 (0.7)	4.2 (1.1)	
Yes, negative	4.1 (0.7)	4.0 (1.2)	
Yes, positive	4.2 (0.6)	4.3 (1.0)	
Have received at least 1 dose of COVID-19 vaccine			0.001
No	4.0 (0.7)	4.0 (1.2)	
Yes	4.2 (0.60	4.2 (1.1)	

Table 3. Hopeful Future Expectation (HFE) Levels by Demographic Characteristics, n=426

	HFE LEVELS			
	LOW (n=62) n (%) or mean (SD)	MODERATE (n=166) n (%) or mean (SD)	HIGH (n=198) n (%) or mean (SD)	*p*
Age group (years)				0.849
16-17	18 (13.6)	50 (37.9)	64 (48.5)	
18-21	44 (15.0)	116 (39.5)	134 (45.5)	
Sex				0.167
Female	31 (13.3)	81 (34.8)	121 (51.9)	
Male	23 (14.7)	67 (43.0)	66 (42.3)	
No answer	8 (21.6)	18 (48.7)	11 (29.7)	
Sexual orientation: LGBTQ+				0.048
No	33 (11.2)	112 (38.1)	149 (50.7)	
Yes	18 (20.9)	33 (38.4)	35 (40.7)	
No answer	11 (23.9)	21 (45.7)	14 (30.4)	
Race				0.287
Caucasian/White	43 (13.5)	121 (38.1)	154 (48.4)	
African American	4 (12.1)	12 (36.4)	17 (51.5)	
Other race	11 (23.9)	19 (41.3)	16 (34.8)	
No answer	4 (13.8)	14 (48.3)	11 (37.9)	
Ethnicity				0.083
Non-Hispanic	51 (13.8)	139 (37.5)	181 (48.8)	
Hispanic	6 (27.3)	10 (45.5)	6 (27.3)	
No answer	5 (15.2)	17 (51.5)	11 (33.3)	
Participant educational level				0.002
High School or less	54 (18.1)	118 (39.6)	126 (42.3)	
Some college or higher	4 (4.0)	34 (33.7)	63 (62.4)	
No answer	4 (14.8)	14 (51.9)	9 (33.3)	
Parent educational level				<.0001
High School or less	34 (29.1)	40 (34.2)	43 (36.8)	
Some college or higher	24 (8.5)	113 (40.1)	145 (51.4)	
No answer	4 (14.8)	13 (48.2)	10 (37.0)	
Religion				<.0001
No religion	31 (24.2)	59 (46.1)	38 (29.7)	
Christianity	15 (6.9)	72 (33.3)	129 (59.7)	
Other religion	6 (33.3)	6 (33.3)	6 (33.3)	
No answer	10 (15.6)	29 (45.3)	25 (39.1)	
Cigarette smoker				0.201
Never	50 (13.6)	141 (38.3)	177 (48.1)	
Current smoker/former smoker	7 (25.0)	11(39.3)	10 (35.7)	
No answer	5 (16.7)	14 (46.7)	11 (36.7)	
E-cigarette user				0.021
Never	38 (11.9)	124 (38.9)	157 (49.2)	
Current user/former user	18 (24.0)	28 (37.3)	29 (38.7)	
No answer	6 (18.8)	14 (43.8)	12 (37.5)	
General health				<.0001
Excellent/Very good/Good	46 (13.0)	126 (35.5)	183 (51.6)	
Fair/Poor	12 (27.3)	26 (59.1)	6 (13.6)	
no answer	4 (14.8)	14 (51.9)	9 (33.3)	
Been told by a health care professional that I have a chronic disease				0.075
No	36 (12.5)	109 (37.9)	143 (49.7)	
Yes	24 (19.1)	53 (42.1)	49 (38.9)	
No answer	2 (16.7)	4 (33.30	6 (50.0)	
LOT-R (Optimism) Score	10.7 (3.6)	12.6 (3.5)	14.6 (3.6)	<.0001
CD-RISC 2 (Resilience) Score	4.6 (1.7)	5.7 (1.4)	6.1 (1.5)	<.0001
What would be your chances of developing severe COVID-19 ?				0.001
Low/very low	31 (10.7)	119 (40.9)	141 (48.5)	
Moderate	20 (26.7)	19 (25.3)	36 (48.0)	
Very high/high	8 (20.5)	18 (46.2)	13 (33.3)	
No answer	3 (14.3)	10 (47.6)	8 (38.1)	
In general, how severe you think COVID-19 disease is?				0.813
Not at all serious/slightly serious	14 (16.5)	35 (41.2)	36 (42.4)	
Moderately serious	29 (14.5)	80 (40.0)	91 (45.5)	
Severely serious	18 (13.1)	50 (36.5)	69 (50.4)	
No answer	1 (25.0)	1 (25.0)	2 (50.0)	
Tested for COVID-19				0.112
Never tested	12 (18.8)	29 (45.3)	23 (35.9)	
Yes, negative	30 (16.8)	62 (39.2)	87 (48.6)	
Yes, positive	15 (9.8)	60 (39.2)	78 (51.0)	
No answer	5 (16.7)	15 (50.0)	10 (33.3)	
Have received at least 1 dose of COVID-19 vaccine				0.022
No	30 (20.8)	54 (37.5)	60 (41.7)	
Yes	31 (11.1)	111 (39.6)	138 (49.3)	
No answer	1 (50.0)	1 (50.00	0	

Chi-square test or Fisher exact test for categorical data; analysis of variance (ANOVA) for continuous data.
Levels of HFE were identified using hierarchical clustering analysis.

14% (51) of non-Hispanic participants, differences between ethnicities did not reach statistical significance (Table 3).

Regarding dispositional optimism, 82% (51) of participants with low HFE reported low level of optimism, but only 9.7% (19) of participants with high HFE reported high level of optimism ($p < .0001$). The CD-RISC2 scores were lower in the low HFE category compared to moderate and high HFE (mean (SD), 4.6 (1.7) vs 5.7 (1.4) vs 6.1 (1.5), $p < .0001$). Pearson correlation indicated that there was a significant positive and moderate correlation between HFE score and CD-RISC2 score ($r = 0.33$, $p < .0001$), and between HFE score and LOT-R score ($r = 0.37$, $p < .0001$).

Dispositional Optimism

The Revised Life Orientation Test (LOT-R) is a standard psychological instrument that assesses one's dispositional level of optimism. Higher scores indicate a more optimistic outlook. Levels of optimism are defined as low (scores between 0-13), moderate (14-18) and high (19-24). In our study, the mean (SD) LOT-R score was 13.2% (3.9), and 52.7% (225) of participants had low level of optimism, while 41.2% (175) and 6.1% (26) had moderate and high levels of optimism, respectively. Lower optimism (high pessimism) was observed among female participants compared to male participants (mean (SD), 13.0 (4.1) vs 13.9 (3.0), $p = 0.018$), LGBTQ+ (mean (SD), 11.3 (4.1) vs 14.0 (3.5), $p < .0001$), Agnostic/no religion participants compared to Christian participants (mean (SD) ,11.3 (3.9) vs 14.3 (3.5), $p < .0001$), current/former cigarette smokers compared to never smokers (mean (SD) 11.5 (4.5) vs 13.4 (3.8), $p = 0.009$), and among participants reporting fair/poor health compared to excellent/good health (9.8 (4.3) vs 13.8 (3.5), $p < .0001$) Table 4.

CD-RISC2 Resilience Scores

The CD-RISC 2 is based on items 1 and 8 (score range from 0-8) of the full 25-item CD-RISC and was developed as a measure of "bounce-back" and adaptability. In our sample, the mean (SD) CD-RISC2 score was 5.7 (1.6). Most demographic characteristics were associated with CD-RISC2 score (Table 5). Lower resilience mean scores were observed among minority groups. Significant mean differences were observed among Hispanic participants compared to non-Hispanic participants (4.8 vs 5.8, $p = 0.0199$), self-identified as LGBTQ+ compared to heterosexual (5.0 vs 5.9, $p < .0001$), and participants practicing another religion compared to Christianity and no religion (4.9 vs 5.4 vs 6.0, $p < .0001$). Lower mean resilience scores were also observed among female

Table 4. Revised Life Orientation Test (LOT-R) Scores by Demographic Characteristics, n=427

	mean (SD)	*p*
Age group (years)		0.279
16-17	12.9 (3.9)	
18-21	13.3 (3.6)	
Sex		0.018
Female	13.0 (4.1)	
Male	13.9 (3.0)	
Sexual orientation: LGBTQ+		<.0001
No	14.0 (3.5)	
Yes	11.3 (4.1)	
Race		0.342
Caucasian/White	13.4 (3.9)	
African American	13.4 (3.7)	
Other	12.5 (3.6)	
Ethnicity		0.409
Non-Hispanic	13.3 (3.9)	
Hispanic	12.6 (2.9)	
Participant educational level		0.113
High school or less	13.1 (3.9)	
Some college or higher	13.8 (3.9)	
Parent educational level		0.001
High school or less	12.4 (3.4)	
Some college or higher	13.6 (4.0)	
Religion		<.0001
No religion/Agnostic	11.3 (3.9)	
Christianity	14.3 (3.5)	
Other religion	13.3 (1.9)	
Cigarette smoker		0.009
Never	13.4 (3.8)	
Current smoker/former smoker	11.5 (4.5)	
E-cigarette user		0.068
Never	13.4 (3.7)	
Current user/former user	12.5 (4.2)	
General health		<.0001
Excellent/Very good/Good	13.8 (3.5)	
Fair/Poor	9.8 (4.3)	
Been told by a health care provider that I have a chronic disease		0.069
No	13.5 (3.9)	
Yes	12.7 (3.9)	

Analysis of variance (ANOVA) or t test p-values.

Table 5. Two-item Version Connor-Davidson Resilience Scale (CD-RISC2) Score by Demographic Characteristics, n=421

	mean (SD)	*p*
Age group (years)		0.341
16-17	5.6 (1.6)	
18-21	5.8 (1.6)	
Sex		0.029
Female	5.6 (1.7)	
Male	5.9 (1.4)	
Sexual orientation: LGBTQ+		<.0001
No	5.9 (1.5)	
Yes	5.0 (1.6)	
Race		0.055
Caucasian/White	5.8 (1.5)	
African American	5.8 (1.6)	
Other race	5.2 (1.8)	
Ethnicity		0.002
Non-Hispanic	5.8 (1.5)	
Hispanic	4.8 (1.9)	
Participant educational level		0.004
High school or less	5.6 (1.6)	
Some college or higher	6.2 (1.3)	
Parent educational level		<.0001
High school or less	5.1 (1.8)	
Some college or higher	6.0 (1.4)	
Religion		<.0001
No religion	5.4 (1.6)	
Christianity	6.0 (1.5)	
Other religion	4.9 (1.1)	
Cigarette smoker		0.006
Never	5.8 (1.5)	
Current smoker/former smoker	5.0 (1.9)	
E-cigarette user		0.048
Never	5.8 (1.5)	
Current user/former user	5.4 (1.7)	
General health		<.0001
Excellent/Very good/Good	5.9 (1.5)	
Fair/Poor	4.8 (1.5)	
Been told by a health care professional that I have a chronic disease		0.118
No	5.8 (1.6)	
Yes	5.5 (1.6)	

Chi-square test or Fisher exact test for categorical data; analysis of variance (ANOVA) for continuous data.

participants compared to male participants (5.6 vs 5.9, $p = 0.029$), and participants with lower educational level compared to some college or higher (5.6 vs 6.1, $p = 0.0016$). Lower resilience scores were also observed among cigarette smokers, e-cigarette users and nonsmokers, and among participants with fair/poor self-reported general health.

Linear Regression Analysis

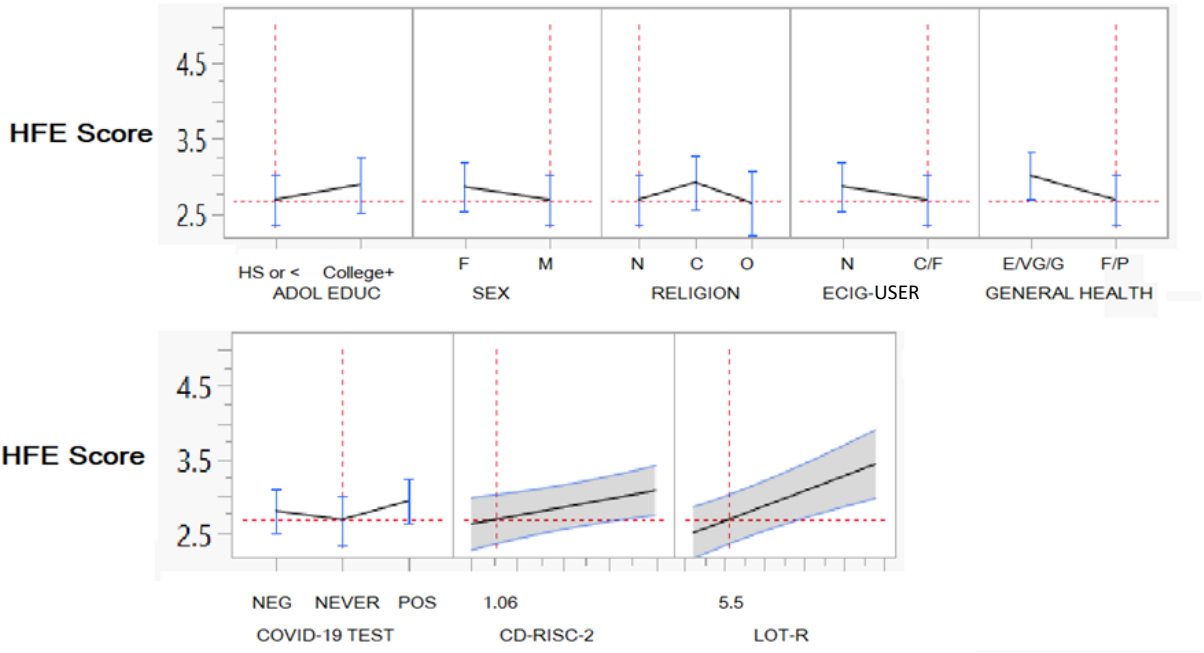
In the final multivariable linear regression model using HFE as continuous dependent variable, the results indicated there was a collective significant effect of sex, participant educational level, religion, general health, e-cigarette use, having had a COVID-19 test, CD-RISC score, and LOT-R score ($F(10, 342) = 13.63$, $p < .0001$, $AdjR^2 = 0.27$). The assumptions of homoscedasticity, independence of observations, and normality of residuals were met.

The profiler plot (Figure 1) shows the predicted response for 2 scenarios at specified values of each of the predictor variables, which are listed across the bottom of graphs. The bracketed values represent the 95% CI for the average HFE score at the values of the predictors. Scenario A displays the predicted mean HFE score of 2.7 (95% CI: 2.3; 3.0), for a male participant who has high school or less, is not associated with any religion, is former/current e-cigarette users, has fair/poor general health, CD-RISC score of 1.06, and LOT-R score of 5.5. In contrast, scenario B displays the predicted mean HFE score of 5.0 (95% CI: 4.9; 5.0] for a female participant with some college or higher education, who identified as Christian, never used e-cigarettes, has excellent/good general health, had a positive COVID-19 test, high CD-RISC score of 7.0, and high LOT-R score of 22.

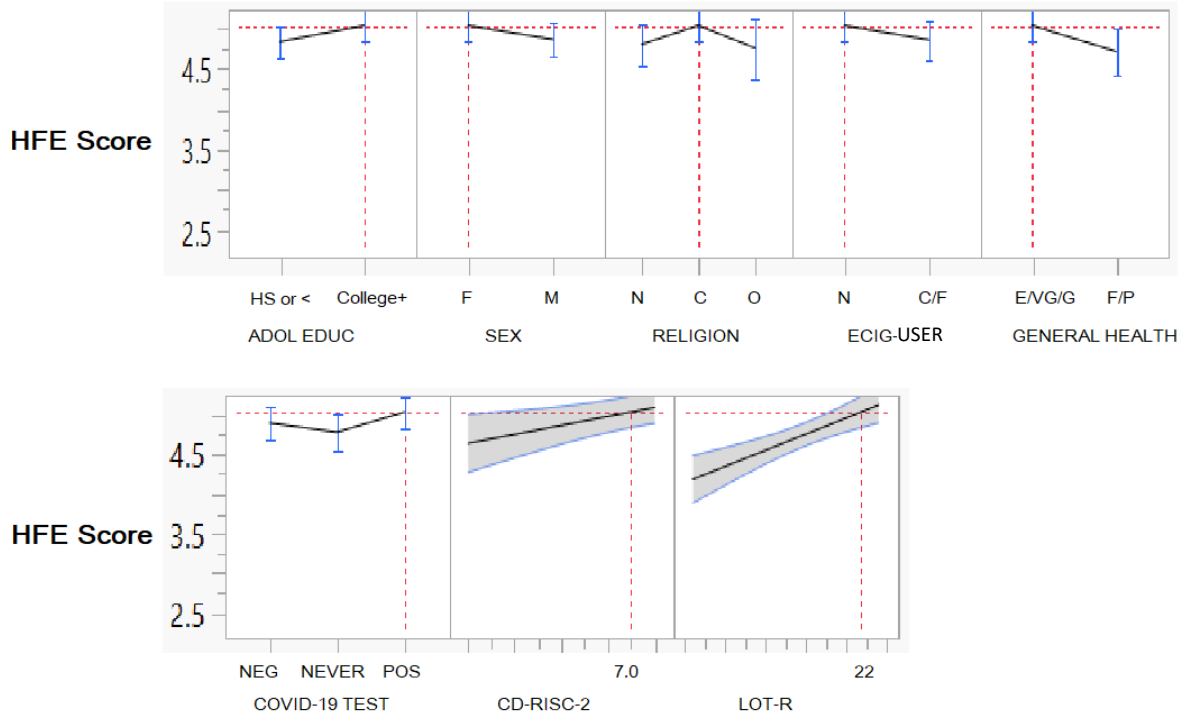
Participant Comments

At the end of the survey, participants had the opportunity to comment on any aspects of the COVID-19 pandemic that were not addressed in the survey. Some participants made general comments about the COVID-19 pandemic's impact on socialization and their political views. Several of the 32 comments were of strong feelings of disappointment with the public authorities and community on how they handled the pandemic. For instance, some said "countries and worlds [sic] response was awful and it should've been better." A total of 5 participants protested the mandatory

Scenar



Scenario B: HFE Score 5.0 [4.9; 5.0]



Abbreviations: HFE=hopeful future expectations; HS=high school; ADOL EDUC=participant educational level; RELIGION: N=no religion, O=other religion, C=Christian; ECIG-USER=e-cigarette user: NEG=negative, POS=positive; GENERAL HEALTH: F/P=fair or poor, E/VG/G=excellent/very good/good; CD-RISC2, 2-item version of Connor–Davidson Resilience Scale; LOT-R, Revised Life Orientation Test;

Figure 1. Linear Regression Model: Prediction Profiler Plot for Hopeful Future Expectations (HFE) Scenarios A and B

vaccination, 6 mentioned issues related to mental health, and 2 stated having their finances or work affected. But 1 comment stood out which may have summarized their experience: "I felt that my growing up was almost stopped…"

There is a small indication, however, that the experience of going through the COVID-19 pandemic resulted in some positive lessons. One stated that "I'm now able to accept change better and not take certain things for granted anymore," and another said the pandemic "has taught me other things about myself. For example, I've found enjoyment out of activities that I tried when quarantined and I became more independent and happier with myself." See Appendix for more comments from participants.

DISCUSSION

As we continue to improve our understanding of the consequences of a large health crisis on the lives of AYA as they make the transition to adulthood, this study provides insights regarding their HFE, resilience, and optimism during the COVID-19 pandemic. This significant public health emergency clearly represents one of the most intense and potentially life-changing events impacting today's adolescents. Indeed, fully 19% of our sample indicated that the pandemic very much or completely affected the way they perceived their future. While high HFE was observed among 39% of participants, difference in HFE scores was observed across most demographic characteristics. Lower levels of HFE were observed among participants who self-identified as LGBTQ+ and Hispanic participants. However, the effects of these demographic factors on HFE were not significant in the presence of other factors in the regression model. The regression results indicated that there was a collective significant effect of sex, participant educational level, religion, general health, e-cigarette use, having had a COVID-19 test, resilience, and optimism scores. It may be that, since LGBTQ+ participants and Hispanic participants showed lower resilience and optimism levels, the presence of resilience and optimism scores in the regression model may have overpowered the effect of these demographic factors on HFE, especially considering the low number of Hispanic participants.

In our sample, the mean HFE (4.1) was lower compared to that found in samples of eighth grade students (4.46) generally.[10] This difference may be in part attributed to their natural development as they enter adulthood, with decreasing HFE in the later high school years and into early adulthood. However, in our study, the difference in HFE between groups of participants aged 16-17 years and aged 18-21 years was not significant. The results observed in this study may be the consequence of the widespread school and workplace closures affecting young people and their families, as well as worries related to their future, their health and that of family and loved ones.

The observed low mean LOT-R of 13.2 indicates high pessimism among our study participants, and an observed moderate mean CD-RISC2 of 5.7 reflects their resilience. Low mean dispositional optimism scores and low resilience scores were found among LGBTQ+ individuals. Although no significant differences in optimism and resilience were observed between races, Hispanic individuals reported significantly lower resilience than non-Hispanic individuals. Because optimism and resilience may serve as a protective factor against suicidality among Latino American[25] and LGBTQ+ individuals,[24] schools, colleges, and health professionals should pay special attention to individuals who belong to minority groups. Other groups that could benefit from some attention could be those with no religion or professing a religion other than Christianity, cigarette smokers, and those reporting fair/poor general health. These groups also reported low resilience and optimism in our sample.

Limitations

Our findings provide estimates of HFE, LOT-R, and CD-RISC2 and identify valuable new insights into the complex processes that contribute to the effect of a pandemic on the HFE of AYA. However, the findings of the present study should be interpreted carefully considering the limitations of this research. This cross-sectional study collected data 2 years after the World Health Organization declared the COVID-19 pandemic. At that time, schools and colleges had resumed their activities and the HFE, resilience, and optimism scores may have been lower during the lockdown period. Regardless, the estimates of HFE, LOT-R, and CD-RISC2 in our sample are a concern, as the literature indicates these measures are associated with risk behaviors among youth. Research has suggested aspirations requiring high levels of education are associated with decreased odds of alcohol and substance use.[12] Although future expectations were not measured, in a survey of Israeli youth aged 15-18 years during the lockdowns in 2020, more than 20% of participants started to or increased their frequency of smoking cigarettes (20.7%), smoking e-cigarettes (27.4%), and smoking cannabis (30.6%).[44] In Canada, a survey of teens aged 16-18 years in 2020 found an increase in the use of alcohol and cannabis.[45]

Some bias might be implied due to the low number of African American participants and members of other minority groups in this sample. It is possible that people in other race categories than Caucasian/White and African American, for instance, would have different responses to the COVID-19 pandemic. Small sample sizes were available for these groups; therefore, their data were aggregated in the other/multiple race category. Aggregated racial and ethnic data might obscure differences in coverage that are apparent in disaggregated subgroups.

Moreover, we acknowledge that population-based studies are not inherently protected from bias; individuals sampled from the hospital patient population, who are seeking services, may consent or refuse to participate in research, and their willingness to participate is unlikely to be random. To ameliorate that, we included any visit to hospital sites and departments, including emergency departments, dental, and all types of visits. Finally, there was a

potential for selection bias if the participation in an online survey is indicative of higher engagement and stronger opinions about the COVID-19 pandemic and/or vaccines in general.

This study was rigorously and carefully designed and conducted to ensure internal validity. Whether or not the internally valid results of this study can be then broadly generalized to other study settings, samples, or populations is a matter of judgment of the relevant findings.[46] This study was designed to be representative of AYA in the Ohio population. However, this approach could have limited the ability to discover opportunities in underserved communities and minorities, both due to an online panel as well as potential language limitations. Focused studies in particular areas and demographics of interest would better suit an analysis of differences within a group or region.

Future Directions

Research examining factors associated with HFE has been limited among AYA. Our findings may have several implications for future research and interventions aiming to improve HFE, which consequently may reduce risky behavior among adolescents, improve their transition to adulthood, and foster a healthy adult life.

Future work should be performed to cross-validate these findings in other populations of AYA. It is possible that cultural differences with respect to parenting and future orientation, participation in sport activities, mentorship, and social engagement in the local community would yield different levels of HFE. More research using a larger general adolescent population and a longitudinal approach would be necessary for a greater understanding of how HFE may influence adolescent transition to adulthood and how these associations may differ by demographic characteristics.

A common starting point for future research would be the acknowledgment of the importance of collecting demographic data from AYA in clinical settings, considering that minority AYA may be exposed to greater frequency and severity of hardships—violence, poverty, hate crimes, family dynamics—compared with their majority same-age peers. Our unique findings among minorities may encourage future research opportunities for investigating and building stronger HFE among AYA.

PUBLIC HEALTH IMPLICATIONS

Reflecting on research that has highlighted the important role of HFE and optimism on the physical and mental health of AYA and that consequently may improve their adult health, this study reinforces suggestions that the development of early interventional programs and the configuration of clinical and public health practices provided to AYA, especially individuals who belong to minority groups, be prioritized in future crises in an effort to facilitate effective life transitions, including passage to college and eventual adulthood.

CONFLICTS OF INTEREST

The authors have no relevant financial or nonfinancial interests to disclose.

ACKNOWLEDGMENTS

The authors are grateful for the adolescents and young adults who kindly agreed to participate in this study.

Statements

The data used during the current study are available from the corresponding author on reasonable request. The authors declare that they have no competing interests. This research project was funded by the Akron Children's Foundation Grant (Grant number #4500086). This study received ethical approval from the Akron Children's Hospital institutional review board (approval no. 2021-058).

Authors have no conflict of interest to disclose.

AUTHOR CONTRIBUTION

Miraides F. Brown: conceptualization, methodology, acquisition of funding, writing–original draft preparation, data analysis and interpretation of the data, review and editing, and approval of the final version of the manuscript. Vinay K. Cheruvu, Jonathan B. VanGeest, Tarah Smith, Diane L. Langkamp: substantial contributions to design, interpretation of data, substantial contributions to acquisition of funding, critical review of the manuscript for important intellectual content, review and editing, and approval of the final version of the manuscript. Nao Mimoto: interpretation of data, critical review of the manuscript for important intellectual content; review and editing; and approval of the final version of the manuscript.

REFERENCES

1. Stoddard SA, Pierce J. Promoting positive future expectations during adolescence: the role of assets. *Am J Community Psychol*. 2015;56(3-4):332–341. https://doi.org/10.1007/s10464-015-9754-7
2. Marciniak J, Johnston CS, Steiner RS, Hirschi A. Career preparedness among adolescents: a review of key components and directions for future research. *J Career Dev*. 2022;49(1):18-40. https://doi.org/10.1177/0894845320943951
3. McCabe K, Barnett D. First comes work, then comes marriage: future orientation among African American young adolescents. *Family Relations: An Interdisciplinary Journal of Applied Family Studies*. 2000;49(1):63–70. https://doi.org/10.1111/j.1741-3729.2000.00063.x
4. International Labour Organization. Youth & COVID-19: impacts on jobs, education, rights, and mental well-being. Survey Report 2020. August 11, 2020. Accessed January 3, 2022. https://www.ilo.org/global/topics/youth-employment/publications/WCMS_753026/lang--en/index.htm
5. von Soest T, Kozák M, Rodríguez-Cano R, et al. Adolescents' psychosocial well-being one year after the outbreak of the COVID-19 pandemic in Norway. *Nat Hum Behav*. 2022;6(2):217–228. https://doi.org/10.1038/s41562-021-01255-w
6. Sarvan S, Muslu L. In the eyes of adolescents, is the pandemic an obstacle or a gain? A qualitative study based on the ecological theory. *J Pediatr Nurs*. 2022;66:15–22. https://doi.org/10.1016/j.pedn.2022.05.012
7. Commodari E, La Rosa VL. Adolescents in quarantine curing COVID-19 pandemic in Italy: perceived health risk, beliefs, psychological experiences and expectations for the future. *Front Psychol.*

2020;11:559951.
https://doi.org/10.3389/fpsyg.2020.559951

8. Lee S-M, Yoo J-I, Youn H-S. Changes in alienation in physical education classes, school happiness, and expectations of a future healthy life after the COVID-19 pandemic in Korean adolescents. *Int J Environ Res Public Health*. 2021;18(20):10981.
https://doi.org/10.3390/ijerph182010981
9. Küçükkelepçe O, Parlak ME, Öz E, Kapıcı Y, Ener D. Future expectation levels of adolescents during the COVID-19 pandemic. *Front Public Health*. 2023;11:1199280.
https://doi.org/10.3389/fpubh.2023.1199280
10. Schmid KL, Phelps E, Lerner RM. Constructing positive futures: modeling the relationship between adolescents' hopeful future expectations and intentional self-regulation in predicting positive youth development. *J Adolesc*. 2011;34(6):1127–1135.
https://doi.org/10.1016/j.adolescence.2011.07.009
11. Bandura A. Social cognitive theory: an agentic perspective. *Annu Rev Psychol*. 2001;52:1–26.
https://doi.org/10.1146/annurev.psych.52.1.1
12. Dudovitz RN, Chung PJ, Nelson BB, Wong MD. What do you want to be when you grow up? Career aspirations as a marker for adolescent well-being. *Acad Pediatr*. 2017;17(2):153–160.
https://doi.org/10.1016/j.acap.2016.08.006
13. Sipsma HL, Ickovics JR, Lin H, Kershaw TS. Future expectations among adolescents: a latent class analysis. *Am J Community Psychol*. 2012;50 (1-2):169–181.
https://doi.org/10.1007/s10464-011-9487-1
14. Sun RC, Shek DT. Beliefs in the future as a positive youth development construct: a conceptual review. *ScientificWorldJournal*. 2012;2012: 527038.
https://doi.org/10.1100/2012/527038
15. Catalano RF, Berglund ML, Ryan JAM, Lonczak HS, Hawkins JD. Positive youth development in the United States: research findings on evaluations of positive youth development programs. *Ann Am Acad Pol Soc Sci*. 2004;591:98–124
https://doi.org/10.1177/0002716203260102
16. Lerner RM, Lerner JV. *The Positive Development of Youth: Comprehensive Findings from the 4-H Study of Positive Youth Development*. December 2013. Institute for Applied Research in Youth Development. Tufts University. Accessed August 1, 2021.
https://dunn.extension.wisc.edu/files/2018/04/4-H-Study-of-Positive-Youth-Development-Full-Report.pdf
17. Scheier MF, Weintraub JK, Carver CS. Coping with stress: divergent strategies of optimists and pessimists. *J Pers Soc Psychol*. 1986;51 (6):1257–1264.
https://doi.org/10.1037/0022-3514.51.6.1257
18. Scheier MF, Carver CS, Bridges MW. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *J Pers Soc Psychol*. 1994;67(6): 1063–1078.
https://doi.org/10.1037//0022-3514.67.6.1063
19. Carver CS, Scheier MF. Dispositional optimism. *Trends Cogn Sci*. 2014;18(6);293–299.
https://doi.org/10.1016/j.tics.2014.02.003
20. Scheier MF, Carver CS. Dispositional optimism and physical health: a long look back, a quick look forward. *Am Psychol*. 2018;73(9):1082–1094.
https://doi.org/10.1037/amp0000384
21. He F, Cao R, Feng Z, Guan H, Peng J. The impacts of dispositional optimism and psychological resilience on the subjective well-being of burn patients: a structural equation modelling analysis. *PloS One*. 2013;8 (12):e82939.
https://doi.org/10.1371/journal.pone.0082939
22. Kapıkıran NA. Positive and negative affectivity as mediator and moderator of the relationship between optimism and life satisfaction in Turkish university students. *Soc Indic Res*. 2012;106(2):333–345.
https://doi.org/10.1007/s11205-011-9807-8
23. Diaconu-Gherasim LR, Mairean, C. Dispositional optimism, affective states and judgements of future life events. *Stud Psychol (Bratisl)*. 2017;59(3):193-205.
https://doi.org/10.21909/sp.2017.03.740
24. Burish E, Wilcox MM, Pollard EM, Sims KN. Differentiating protective factors for transgender individuals who experience suicidality: The role of optimism as a mediator. *Clin Psychol Psychother*. 2023;30(3):702–713.
https://doi.org/10.1002/cpp.2833
25. Yu EA, Chang EC. Optimism/pessimism and future orientation as predictors of suicidal ideation: Are there ethnic differences?. *Cultur Divers Ethnic Minor Psychol*. 2016;22(4):572–579.
https://doi.org/10.1037/cdp0000107
26. Baldwin DR, Jackson D III, Okoh I, Cannon RL. Resilience and optimism: an African American senior citizen's perspective. *J Black Psychol*. 2011;37(1):24-41.
https://doi.org/10.1177/0095798410364394
27. Seligman MEP. Building resilience. *Harv Bus Rev*. 2011;89(4):100–138.
https://hbr.org/2011/04/building-resilience
28. Klohnen EC. Conceptual analysis and measurement of the construct of ego-resiliency. *J Pers Soc Psychol*. 1996;70(5):1067–1079.
https://doi.org/10.1037/0022-3514.70.5.1067
29. Agaibi, CE, Wilson JP. Trauma, PTSD, and resilience: a review of the literature. *Trauma Violence Abuse*. 2005;6(3):195–216.
https://doi.org/10.1177/1524838005277438
30. Rutter M. Implications of resilience concepts for scientific understanding. *Ann NY Acad Sci*. 2006;1094:1–12.
https://doi.org/10.1196/annals.1376.002
31. Connor KM, Davidson JR. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). *Depress Anxiety*. 2003;18 (2):76–82.
https://doi.org/10.1002/da.10113
32. Pearce, JR, Richardson EA, Mitchell RJ, Shortt NK. Environmental justice and health: the implications of the socio-spatial distribution of multiple environmental deprivation for health inequalities in the United Kingdom. *Trans Inst British Geogr*. 2010;35(4):522-539.
https://doi.org/10.1111/j.1475-5661.2010.00399.x
33. Herzberg PY, Glaesmer H, Hoyer J. Separating optimism and pessimism: a robust psychometric analysis of the Revised Life Orientation Test (LOT-R). *Psychol Assess*. 2006;18(4):433–438.
https://doi.org/10.1037/1040-3590.18.4.433

34. Steca P, Monzani D, Greco A, Chiesi F, Primi C. Item response theory analysis of the life orientation test-revised: age and gender differential item functioning analyses. *Assessment*. 2015;22(3):341–350. https://doi.org/10.1177/1073191114544471
35. Oreskovic NM, Goodman E. Association of optimism with cardiometabolic risk in adolescents. *J Adolesc Health*. 2013;52(4):407–412. https://doi.org/10.1016/j.jadohealth.2012.09.011
36. Bałanda-Bałdyga A, Pilewska-Kozak AB, Łepecka-Klusek C, Stadnicka G, Dobrowolska B. Attitudes of teenage mothers towards pregnancy and childbirth. *Int J Environ Res Public Health*. 2020;17(4):1411. https://doi.org/10.3390/ijerph17041411
37. Vaishnavi S, Connor K, Davidson JR. An abbreviated version of the Connor-Davidson Resilience Scale (CD-RISC), the CD-RISC2: psychometric properties and applications in psychopharmacological trials. *Psychiatr Res*. 2007;152(2-3):293–297. https://doi.org/10.1016/j.psychres.2007.01.006
38. Jeevarajan JR, Theodorou A, Nandy K, et al. Psychometric properties of the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) in adolescent and young adult psychiatric outpatients in the Texas Youth Depression and Suicide Research Network (TX-YDSRN). *J Affect Disord*. 2025;375:155-164. https://doi.org/10.1016/j.jad.2025.01.091
39. Jeličić H, Phelps E, Lerner RM. Use of missing data methods in longitudinal studies: the persistence of bad practices in developmental psychology. *Dev Psychol*. 2009;45(4):1195–1199. https://doi.org/10.1037/a0015665
40. Elliott MN, Edwards C, Angeles J, Hambarsoomians K, Hays RD. Patterns of unit and item nonresponse in the CAHPS Hospital Survey. *Health Serv Res*. 2005; 40(6p2):2096–2119. https://doi.org/10.1111/j.1475-6773.2005.00476.x
41. Fowler FJ Jr, Cosenza C, Cripps LA, Edgman-Levitan S, Cleary PD. The effect of administration mode on CAHPS survey response rates and results: a comparison of mail and web-based approaches. *Health Serv Res*. 2019;54(3):714–721. https://doi.org/10.1111/1475-6773.13109
42. Meyer VM, Benjamens S, Moumni ME, Lange JFM, Pol RA. Global overview of response rates in patient and health care professional surveys in surgery: a systematic review. *Ann Surg*. 2022;275(1):e75–e81. https://doi.org/10.1097/SLA.0000000000004078
43. Perneger TV, Peytremann-Bridevaux I, Combescure C. Patient satisfaction and survey response in 717 hospital surveys in Switzerland: a cross-sectional study. *BMC Health Serv Res*. 2020;20(1):158. https://doi.org/10.1186/s12913-020-5012-2
44. Shapiro O, Gannot RN, Green G, et al. Risk behaviors, family support, and emotional health among adolescents during the COVID-19 pandemic in Israel. *Int J Environ Res Public Health*. 2022;19(7):3850. https://doi.org/10.3390/ijerph19073850
45. Dumas TM, Ellis W, Litt DM. What does adolescent substance use look like during the COVID-19 pandemic? Examining changes in frequency, social contexts, and pandemic-related predictors. *J Adolesc Health*. 2020;67(3):354–361. https://doi.org/10.1016/j.jadohealth.2020.06.018
46. Kukull WA, Ganguli M. Generalizability: the trees, the forest, and the low-hanging fruit. *Neurology*. 2012;78(23):1886–1891. https://doi.org/10.1212/WNL.0b013e318258f812

APPENDIX—Final Comments of Participants About COVID-19 Pandemic

Please note: The following participant responses are presented verbatim and have not been edited for grammar or spelling.

- "A lot of people's lives were upended during the pandemic, and it was really difficult on my family financially."
- "I couldn't work because of covid cases."
- "We put so many peoples lives on the line medical personable and mandatory workers specifically my mom is an X-ray Tech n everyday we weren't sure if she'd get sick she has multiple preexisting conditions too luckily she was ok, but some people weren't I'm sorry to everyone who lost a loved one and I'm sad that our culture hasn't shifted to be cleaner as a result of the pandemic."
- "Almost everyone my age I know has some sort of depression or anxiety or lack of hope for the future directly related to Covid and how insecure our generations future is"
- "I felt that my growing up was almost stopped by the pandemic unable to attend school and see friends stoped me from building a healthy and social life style and I am just know recovering it."
- "Mental illnesses worsened with Covid-19"
- "Fear of not socializing normal in the future like next year for senior year or even college"
- "It sucked and the country's and worlds response was awful and it should've been better"
- "It's shown me who the people are who don't care about others"
- "Its stressful when it feels like the adults in charge are just as clueless as you when it comes to making life normal again."
- "The world had a complete over reaction"
- "We need a new President"
- "after adapting to the pandemic, I believe I'm now able to accept change better and not take certain things for granted anymore."
- "I think that aside from the downfalls of the pandemic it has taught me other things about myself. For example I've found enjoyment out o activities that I tried when quarantined and I became more independent and happy with myself."
- "Covid made me never have a prom"
- "my junior and senior year of high school wasn't the way it should have been - I missed out on sports and dances and fun. plus, my freshman year of college was not a normal experience. I hope it gets better in the fall for my sophomore year."
- "did not attend in class high school for 1 and a half years, this was ca terrible time for me because I just got diagnosed with type 1 diabetes the week before classes ended because of covid."
- "Government, employers and should NOT be allowed to force us to get any vaccine or we lose our jobs, etc."
- "I've never been a fan of shots and more now than ever. The conducted a vaccine that we had just encountered and had a vaccine approved to be used within less than a year. Mind you, covid was created by a person."
- "Live Normal. Do not make the vaccine mandatory. Use common sense, just like you would not visit family with the flu, same applies with the virus."
- "Should our government or employers be allowed to force us get vaccinated or lose our jobs? NO!"
- "The covid 19 vaccine is not a "typical" vaccine, it's a new kind, so I'd rather wait a few years to see if anyone has any side effects. Plus, since people are still testing positive for covid being fully vaccinated, there's no point in getting anymore. In order to keep up with the virus variants, they're going to have to continue making more and more boosters which is just not going to be efficient."
- "Me and most of my circle of friends would die if we caught COVID. I try so hard to keep us all safe because I'm the only one who can get vaccinated."
- "I forgot to mention body aches on the list of common symptoms for Covid. I feel like I'm less likely to get it than my peers because I mask indoors. The only reason I did this was for the Amazon gift card I got sent in the mail. I hope it's five dollars or more."
- "I respect everybody's decisions on how they handle this pandemic, these are just my personal feelings"
- "It sucks"
- "It suck's"
- "It was bad"
- "Nothing to share"
- "Thank you"
- "With the pandemic hopefully coming to a close, this questionnaire was extremely thoughtful to the concerns of young adults and I was glad to help."
- "nothing :)"