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Health-related quality of life among adolescents as a function of victimization, other adversities, and strengths☆

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ABSTRACT

Purpose: Most children are exposed to violence (e.g., peer, family, or community violence), which makes children's exposure to violence one of our most urgent social problems. The objective of this project was to examine health-related quality of life (HRQOL) in a vulnerable community sample and identify promising psychological and social protective factors to promote HRQOL in youth.
Design and methods: The sample was 440 youth ages 10 to 21 (average age 16.38, SD = 3.04), recruited from youth-serving organizations. Participants completed a survey on HRQOL, victimization, other adversities, and a range of 16 psychological and social strengths.
Results: Almost 9 in 10 (89.3%) youth reported at least one victimization during their lifetime, and impaired HRQOL was common, with more than half reporting some health impairment in the month prior to the survey. Although all psychological and social strengths were positively correlated with HRQOL at the bivariate level, hierarchical regression indicated that a *sense of purpose* and *recovering positive affect* uniquely contributed to better HRQOL, after controlling for victimization, other adversities, poverty, age, and gender (total $R^2 = 0.21$). Strengths accounted for more variance in HRQOL than did adversities.
Conclusions: In this highly victimized sample of youth, many strengths were associated with improved HRQOL for youth, with sense of purpose and recovering positive affect showing the most promise for future prevention and intervention.
Practical implications: Programs aimed at reducing the negative impact of childhood exposure to violence may increase their impact by developing key strengths versus solely focusing on alleviating symptoms.

Introduction

Most children are exposed to violence, when peer, family, and community violence are all taken into consideration (author citation), which makes children's exposure to violence (CEV) an urgent social problem. Two lines of research have shown promise in increasing our understanding and capacity to prevent CEV and intervene more effectively when it does occur. The first is the recognition of poly-victimization, or the cumulative burden of different types of CEV (Finkelhor, Turner, Ormrod, & Hamby, 2009). The second is research on the long-term consequences of adverse childhood experiences (ACEs, Felitti et al., 1998). Both lines of research indicate that the cumulative burden of adversity is a powerful correlate of psychological symptoms and other negative consequences. Among adults, studies show that youth victimization is a powerful predictor of many adult health conditions (Gilbert et al., 2015). However, the impact of victimization and other adversity on youth's health has been less studied. Literature on the physical health impact of victimization on youth has focused on contemporaneous injuries (e.g., Simon et al., 2018). However, conceiving of physical health solely as the presence or absence of injury or disease obscures important aspects, and fails to capture the full picture of physical well-being. The concept of "health-related quality of life" (HRQOL) was introduced to address this gap (Moriarty, Zack, & Kobau, 2003). To assess physical well-being more holistically, HRQOL incorporates indicators of positive health, such as feeling full of energy, and the impact of health on daily activities. Although HRQOL is commonly studied in adult health research (e.g., Fredriksen-Goldsen, Kim, Shiu, Goldsen, & Emlet, 2014; van Mierlo, van Heugten, Post, Hoekstra, & Visser-Meily, 2018), less is known about the risk factors that affect adolescents' health-related quality of life, and even less about protective factors that might promote better HRQOL among youth who have

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experienced victimization or other adversity. The current study examines adolescent HRQOL and the associations of HRQOL with a wide range of psychological and social strengths in a highly victimized community sample.

Victimization, other adversities, and health

Many adversities can negatively impact health, including victimization, family dysfunction, and poverty. Felitti et al.'s (1998) seminal work showed that exposure to childhood adversities had lingering physical health effects decades later, a finding that has been replicated many times (Gilbert et al., 2015). Poly-victimization research has shown numerous psychological and social impacts of youth victimization during childhood, including suicidality, and symptoms of depression and anxiety (Finkelhor et al., 2009; Turner, Finkelhor, Shattuck, & Hamby, 2012). These and other studies indicate that the total burden of victimization matters more than any one type, and that even experiences that used to be minimized, such as bullying or witnessing violence, contribute to a person's victimization burden. However, past research has seldom explored the impacts of victimization on physical health among children.

Despite their young age, poor physical health among children is not rare and is associated with many risk factors. The association of childhood obesity with HRQOL has been one focus of past research (Kim, Lee, & Sohn, 2016; Morrison, Shin, Tarnopolsky, & Taylor, 2015). However, many medical conditions are associated with lower HRQOL, including diabetes, gastrointestinal conditions, cardiac conditions, asthma, obesity, end stage renal disease, psychiatric disorders, cancer, rheumatologic conditions, and cerebral palsy (e.g., Coghill & Hodgkins, 2016; Varni, Limbers, & Burwinkle, 2007). Social factors such as family income are also associated with adolescent HRQOL (Lam, Guo, Wong, Yu, & Fung, 2016; Von Rueden, Gosch, Rajmil, Bisegger, & Ravens-Sieberer, 2006).

Fewer studies have examined victimization and HRQOL among youth, and the findings have been mixed. For example, one study of bullying did not find a significant association between bullying and physical well-being (Wilkins-Shurmer et al., 2003), while another study found a relationship between peer victimization and physical health (Haraldstad, Kvarme, Christophersen, & Helseth, 2019). The lack of a comprehensive assessment of victimization may be one reason for mixed findings. Recent research in China, Germany, and Vietnam on poly-victimization and HRQOL has found a link in these countries (Chan, 2013; Chan, Chen, Chen, & Ip, 2017; Schlack, Ravens-Sieberer, & Petermann, 2013; Tran, Dunne, Vo, & Luu, 2015), but this is still an emerging research area, with more information especially needed on younger adolescents and those living in more vulnerable communities.

Resilient health outcomes for victimized youth

Although the variety of risk factors associated with HRQOL are increasingly well-recognized, less attention has been paid to protective factors, or assets and resources that can promote HRQOL. Despite the high burden of adversity experienced by most youth, many youths nonetheless demonstrate considerable resilience, which we define as a process that leads to well-being after experiencing victimization or other adversity. The Resilience Portfolio Model (Grych, Hamby, & Banyard, 2015) focuses on three domains of strengths that help youth achieve resilient outcomes: regulatory, meaning making, and interpersonal. Regulatory strengths include constructs like impulse control and emotion regulation. Meaning-making strengths include sense of purpose and mattering. Interpersonal strengths include social and community support. The model also suggests that not only are individual strengths important, but also the total number of different strengths that someone has, a concept we refer to as *poly-strengths* (Hamby, Grych, & Banyard, 2018).

The resilience portfolio model has been used to study psychological outcomes in an older U.S. sample and Spanish youth (Gonzalez-Mendez, Ramírez-Santana, & Hamby, 2018; Hamby, Grych, et al., 2018). However, little is known about which psychological and social strengths promote resilience among U.S. youth. Even less is known about which strengths promote better physical well-being, as measured by HRQOL, beyond one study that identified meaning making, social support, and emotional regulation as promising protective factors in a sample with an average age of 30 (Banyard, Hamby, & Grych, 2017), and another that suggested social support as a promising protective factor, albeit in a study that did not assess other malleable protective factors (Chan et al., 2017). Sabina and Banyard (2015) have called for researchers to examine combinations of protective factors rather than focus on one at a time, to help providers target the most important factors for prevention and intervention. One obstacle to more comprehensive studies has been the limited availability of strengths measures, especially for characteristics of families, schools, and communities. This is particularly problematic for youth, who depend on these social institutions for the resources that they need to cope with victimization and other adversity.

Current study

The current study examines HRQOL, poly-victimization, and psychological and social strengths in a sample with a high proportion of youth from low-income communities located in the southern U.S. We measured 16 psychological and social strengths, several of which were identified in mixed-methods qualitative work to expand the range of protective factors studied (Hamby et al., 2019). We examined which psychological and social strengths are most associated with health-related quality of life among youth, after controlling for victimization, other adversities, and demographics. We anticipate, based on prior research, that victimization rates will be high, that poly-victimization will be inversely correlated with health-related quality of life, and that all strengths will be positively correlated at the bivariate level with health-related quality of life. Given limited previous multivariate research on protective factors and health-related quality of life among youth, we will explore which strengths are uniquely associated with health-related quality of life.

Method

Participants

Participants were 440 youth from four states in the southern United States (AL, GA, MS, TN). The sample ranged from 10 to 21 years of age ($M = 16.38$, $SD = 3.04$), and was 61.1% female. The sample identified as 69.9% White or European American (non-Latino), 17.1% Black or African American (non-Latino), 5.6% multiracial, 3.9% Latino, 1.9% American Indian or Alaska Native (non-Latino), and 1.6% Asian (non-Latino). In terms of residency, 33.6% reported living in a small town (population about 2500–20,000), 27.4% reported living in a rural area (population under 2500), 15% reported living in a smaller city (population about 100,000–300,000), 14.1% reported living in a town (population about 20,000–100,000), 7.4% reported living in a larger city (population over 300,000), and 2.5% reported living in a suburb of a large city. Over half (51.3%) of the sample reported receiving free or reduced lunches at school. Median household income for their counties of residence (2016 data) was $47,713.40 ($SD = 11,635.61$), below the national average.

Procedure

Participants were recruited through youth-serving organizations in 2017 and 2018. The youth-serving organizations were recruited from the surrounding community through attending meetings at local health councils (county-level organizations of area non-profits and service agencies) and word-of-mouth. The survey was administered as a

computer-assisted self-interview, using the SNAP11 software platform on computer tablets. On average, the survey took approximately 22 min to complete. Organizations received a stipend of $20 per participant. Informed consent, including parental consent for minors, was obtained for all participants. All procedures were IRB approved. The overall completion rate was 92%, which is an excellent result by current survey standards, with some survey completion rates often under 70% and sometimes under 50% (Abt SRBI, 2012; Galesic & Bosnjak, 2009).

Measures

Development and validation of measures

Given that our sample included significant numbers of young adolescents, it was essential that the reading level be appropriate for all participants. Brevity was also a priority. As noted in the Introduction, another key goal of the study was to expand the number of protective factors assessed and to develop measures for constructs that might be most relevant for youth resilience. In previous studies, we simplified and adapted items from existing questionnaires (Hamby, Grych, et al., 2018). In the current study, based on the previous results, we further adapted items for existing measures so they would be well understood by youth (Hamby, Taylor, Smith, & Blount, 2018). Further, to broaden the range of strengths assessed in the current study, additional measures were developed through a 3-stage mixed methods process, with common and salient strengths first identified in focus groups, then vetted in cognitive interviews, and then refined and incorporated into the survey (also see Hamby et al., 2019). Factor analysis in the current sample was also used for further clarifying of constructs. Validity was established with moderate correlations with related constructs and was consistent with previous work on resilience portfolio measures (Hamby, Grych, et al., 2018, also see Table 2). Full scales are available at https://www.lifepathsresearch.org/strengths-measures/. See Fig. 1 for a description of the 3-stage process. The final survey has a Flesch-Kincaid reading level of 5.3.

Unless specified, response categories were on a 4-point Likert scale with 1 denoting "Not true about me" and 4 denoting "Mostly true about me." Standardizing response categories across items reduces the respondent burden, shortens survey time, minimizes method variance, and is common for large scale community surveys. There was very little missing data, with an average of only 1.1.% (range 1–3.2%). Following standard data practices, missing responses were imputed based on the average of answers to other items on same scale. In all cases, higher scores represent higher levels of strengths, psychological functioning, and adversity. Further details on each measure are below.

Adversities included three broad domains—interpersonal victimization, other adverse life events, and poverty. The *Juvenile Victimization Questionnaire (JVQ)—Key Domains Short Form* includes 10 items assessing lifetime history of a range of interpersonal victimizations, including direct and indirect exposure to violence, adapted from the full JVQ (Hamby, Finkelhor, Ormrod, & Turner, 2004; Hamby, Grych, et al., 2018). A sample item is "During your childhood, did one of your parents threaten to hurt another parent and it seemed they might really get hurt?" Dichotomous items ("yes" or "no") were summed to create a total victimization score. Alpha is 0.73 in this sample. *Adverse Life Events.* A 6-item scale, adapted from prior work (Turner, Shattuck, Hamby, & Finkelhor, 2013) to better focus on youth, that measures several major life challenges that are not intentional victimizations. Responses were dichotomous, and "yes" answers were summed to create a total score. A sample item is "At any time in your life, has a family member or close friend died?" Because endorsing one event does not necessarily imply experiencing another event, no internal consistency is reported. *Poverty.* Because youth are unlikely to have detailed information on family income, we used two proxies for low income. One indicator was individual self-report of "Did you ever get free or reduced lunches at school?" Over half (51.3%) of the sample reported receiving free or reduced lunches at school. The second indicator was county income

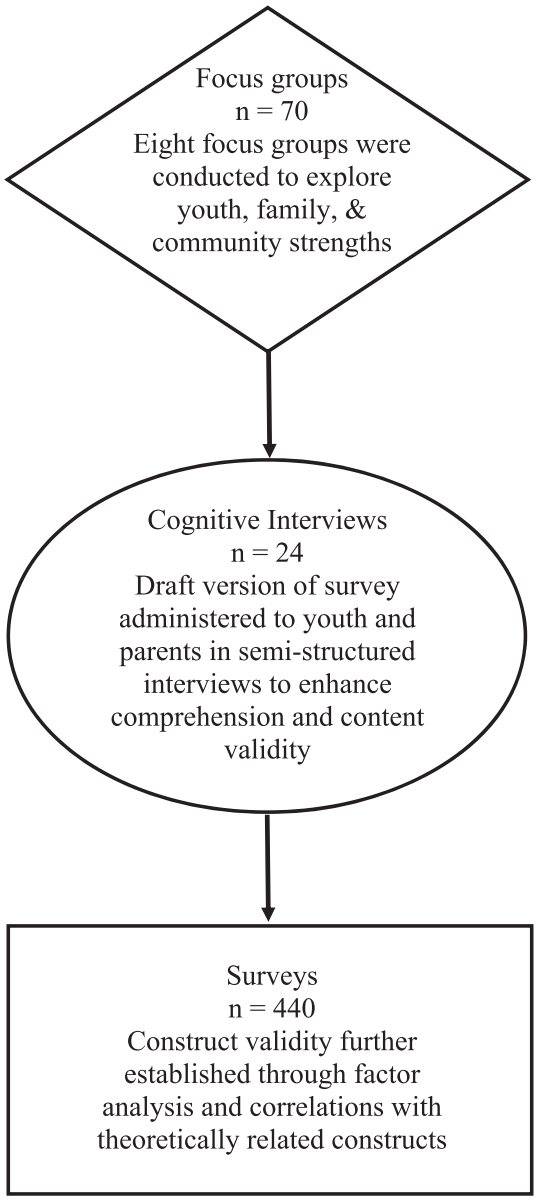

Fig. 1. Flow chart displaying the progression through the 3-stage mixed methods process to develop and validate strengths measures.

(obtained from the U.S. Census Bureau, https://www.census.gov/data/datasets/2016/demo/saipe/2016-state-and-county.html). Average median household income for participants' county of residence was $47,713.40 ($SD$ = 11,635.61) in 2016 (most recent information at time of data collection). This is 19% lower than the $59,039 average for the U.S. Almost 9 out of 10 youth (86.8%) came from counties with median household incomes below the national average.

Regulatory strengths assess various aspects of self-control, especially when confronting difficulties. These scales were developed or adapted via the mixed-methods process described above (Hamby, Taylor, et al., 2018). The *Psychological Endurance Scale* is a simplified, 5-item version of a measure (Hamby, Grych, et al., 2018) to assess one's ability to persevere despite challenges (internal consistency assessed by coefficient $\alpha = 0.69$). A sample item is "When hard times come around, I face them head-on." *Recovering Positive Affect* is 6 items ($\alpha = 0.81$) that assess the ability to return to a good mood after distress. A sample item is "I can cheer myself up after a bad day." *Self-reliance* measures the ability to cope by using one's own resources (3 items, $\alpha = 0.81$). A sample item is "I like to solve problems on my

own." *Impulse Control* assesses behavioral self-regulation (5 items, $\alpha =$ 0.63). A sample item is "I stop to think before I act."

Meaning making strengths assess ways that individuals seek fulfilment, often by connecting to something larger than themselves (Hamby, Taylor, et al., 2018). *Sense of Purpose* (6 items; $\alpha = 0.88$) involves feeling like one has a sense of meaning in life and a reason for living. Adapted for youth from a previous version (Hamby, Grych, et al., 2018). A sample item is: "My values give my life meaning." *Mattering* (5 items; $\alpha = 0.86$) measures the extent to which participants felt appreciated and valued by others. Sample item: "I feel appreciated by my family and friends." *Future Orientation* (6 items; $\alpha = 0.79$) measures the desire for self-improvement. Sample item: "The choices I make today are important for my future." *Relational Motivation* (3 items; $\alpha = 0.70$) refers to feeling inspired by important people in one's life. Sample item: "I want the people in my life to be proud of me." *Religious Meaning-making* (6 items; $\alpha = 0.94$) assess the degree to which an individual's engages in faith and religious/spiritual practices. Adapted and simplified for youth from a previous version (Hamby, Grych, et al., 2018). Sample item: "When dealing with a problem, I ask others to pray for me."

Interpersonal strengths include the participants' relational skills and also indicators of support from their larger social environment. *Community Support* (Roberts, Hamby, Banyard, & Grych, 2015) is six items that assess the degree to which one's neighbors get along and helps one another ($\alpha = 0.80$). A sample item is "People in my neighborhood offer help to one another." *Compassion* (Hamby, Grych, et al., 2018) measures how people engage with others in a caring and helpful way (4 items, $\alpha = 0.80$). A sample item is "When others feel sad, I try to comfort them."

The remaining scales were developed via the mixed-methods process described above and were designed to capture more aspects of youths' social ecology (Hamby, Taylor, et al., 2018; Hamby et al., 2019). *Group Connectedness* (6 items, $\alpha = 0.80$) assesses feelings of closeness and support from peer groups. A sample item is "I have belonged to a group or team with people who stand up for me." *School Climate* (6 items, $\alpha = 0.78$) measures characteristics of healthy school environments, such as "My school building is in good condition." *Social Support Received* (6 items, $\alpha = 0.80$) assesses help or encouragement provided in times of distress. A sample item is "Someone was there for me when I was having a hard time." *Social Support Seeking* (6 items, $\alpha = 0.89$) assesses youth's efforts to attain help. A sample item is "I talk to someone to help me solve problems." *Teacher Engagement* (5 items, $\alpha = 0.86$) assesses youths' experiences with enthusiastic, caring teachers. A sample item is "I had a teacher who wanted me to do well in school."

We defined "*poly-strengths*" as the total number of strengths each individual reported at above average levels (> 0.5 SD). Thus, it is an indicator of the diversity of an individual's portfolio of strengths. In this sample, the range was from 0 to 16 (total number of protective factors we surveyed), with a mean of 6.85 (SD 4.13).

Health-related quality of life (HRQOL; 5 items, $\alpha = 0.64$) is based on the CDC measure (Centers for Disease Control and Prevention, 2000), simplified and adapted, and assesses general physical well-being, such as feeling full of energy or being limited in daily activities due to illness or pain. Construct validity was established in a previous study (Banyard, et al., 2017) and in this sample with a correlation of 0.41 with subjective well-being. Sample item: "During the last month, for about how many days did your health stop you from doing your usual activities, like going to school or spending time with friends?" See Table 1 for further information on item content. Higher scores on this index indicate better health-related quality of life in the month prior to the survey. A measure of thriving in HRQOL was also created by dichotomizing the scale score at >0.5 SD = 1, and scores lower than that = 0.

Data analysis

For data analysis, all scale scores were standardized by converting to *Z*-scores (mean converted to 0 with a standard deviation of 1). Correlation analyses were conducted to explore the relationships between HRQOL and the other measures. Hierarchical logistic regression was used to explore the unique contribution of adversities and strengths on HRQOL, transformed into a dichotomous variable to emphasize factors that contribute to above-average health. In the first block, we entered age and gender. The second block consisted of the adversity and economic status indicators. Lastly, in the third block, we included poly-strengths and the sixteen psychological and social strengths to see if they made a unique contribution to HRQOL after controlling for adversities and demographic variables.

Results

Rates of victimization and adversity

In this sample from predominantly low-income communities, the rates of children's direct and indirect exposure to violence were high, with almost 9 in 10 youth (89.3%) reporting at least one victimization experience in their lifetime. Other types of non-victimization adversity, especially dealing with the death or serious illness of a friend or family member, were even more common, with at least one type of adversity in their lifetime being reported by virtually every youth (99.5%).

Health-related quality of life status

Despite the young age of the sample, fairly high percentages also reported diminished health-related quality of life in the month prior to completing the survey. See Table 1. For example, more than half the sample (51.8%) reported that they had not been "healthy and full of energy" every day in the last month, while almost half (42.8%) reported that pain interfered with their activities at least once in the last 30 days. Approximately 1 in 8 (12.6%) reported that pain interfered with their daily activities more than half the month.

Correlations

Correlations among all variables are depicted in Table 2. As predicted, HRQOL was moderately inversely correlated with poly-victimization, $r = -0.32$. Further, the HRQOL scores of non-victims were more than a standard deviation higher than HRQOL scores for the most highly victimized youth. See Fig. 2, which shows the association between poly-victimization and HRQOL. However, HRQOL was not significantly correlated with other adverse life events, receiving

Table 1
Frequencies, mean, and SD's of items from health-related quality of life scale.

	Excellent	Very good	Good	Fair	Poor	M	SD
1. Current health status	29.0%	37.8%	25.1%	6.5%	1.6%	3.86	0.96
	Every day/almost every day	About 3 weeks	About 2 weeks	1 week or less	0 days	M	SD
2. Days health was not good	2.8%	5.5%	10.1%	38.9%	42.8%	4.13	0.99
3. Days health stopped you from doing activities	1.8	2.3	5.1	29.2	61.6	4.46	0.84
4. Days pain made it hard to do usual activities	3.4	2.5	6.7	30.1	57.2	4.35	0.96
5. Days healthy and full of energy	48.2	17.7	14.0	12.2	8.0	3.88	1.35

Table 2
Correlations among all variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1. Health-related quality of life	–	-0.04	-0.09	**-0.32**	0.07	-0.08	0.03	**0.31**	**0.27**	**0.26**	**0.32**	*0.10*	**0.25**	**0.41**	**0.37**	**0.26**	**0.19**	**0.25**	**0.15**	**0.21**	**0.23**	**0.19**	**0.14**	**0.30**
2. Age		–	**0.18**	-0.06	**0.23**	**-0.33**	**0.35**	**0.15**	*0.10*	**0.18**	-0.04	0.06	**0.13**	0.08	0.02	0.09	*-0.11*	0.06	**0.17**	0.08	**0.19**	0.05	*0.12*	*0.12*
3. Gender			–	0.01	**0.15**	**-0.21**	**0.18**	**0.12**	-0.05	*0.12*	**-0.14**	0.07	*0.11*	0.03	0.00	*0.10*	0.00	0.02	**0.22**	0.05	0.06	0.07	0.07	*0.10*
4. Victimization (JVQ)				–	-0.01	**0.17**	0.01	**-0.22**	-0.04	**-0.22**	**-0.21**	0.03	-0.08	**-0.40**	**-0.24**	**-0.19**	*-0.10*	**-0.19**	-0.05	**-0.14**	**-0.26**	*-0.12*	*-0.12*	**-0.15**
5. Other Adverse Life Events					–	*-0.12*	0.05	0.06	-0.01	*0.11*	-0.03	0.04	0.02	0.03	-0.03	0.03	0.01	0.04	0.08	-0.02	**0.14**	-0.01	0.03	0.06
6. Receive Free Lunches						–	**-0.34**	**-0.20**	-0.03	**-0.16**	-0.05	-0.01	*-0.09*	**-0.20**	*-0.10*	**-0.22**	-0.02	**-0.22**	**-0.22**	-0.06	**-0.28**	*-0.11*	**-0.16**	**-0.20**
7. County Median Household Income							–	0.02	-0.04	0.06	-0.09	-0.04	0.08	*0.10*	0.00	*0.11*	*-0.11*	0.01	**0.13**	0.08	0.08	0.07	0.03	0.05
8. Poly-strengths								–	**0.54**	**0.55**	**0.54**	**0.40**	**0.55**	**0.59**	**0.63**	**0.52**	**0.47**	**0.49**	**0.51**	**0.45**	**0.57**	**0.53**	**0.57**	**0.56**
9. Endurance									–	**0.39**	**0.47**	**0.35**	**0.50**	**0.37**	**0.49**	**0.27**	**0.40**	**0.32**	**0.30**	**0.34**	**0.28**	**0.26**	**0.33**	**0.32**
10. Impulse Control										–	**0.31**	**0.27**	**0.40**	**0.35**	**0.37**	**0.37**	**0.18**	**0.29**	**0.34**	**0.25**	**0.46**	**0.27**	**0.29**	**0.37**
11. Recovering Positive Affect											–	**0.27**	**0.32**	**0.47**	**0.55**	**0.31**	**0.36**	**0.31**	**0.22**	**0.30**	**0.34**	**0.27**	**0.31**	**0.31**
12. Self-reliance												–	**0.27**	**0.19**	**0.22**	**0.33**	**0.21**	*0.10*	**0.27**	**0.22**	**0.25**	**0.19**	**0.20**	**0.27**
13. Future Orientation													–	**0.42**	**0.53**	**0.42**	**0.34**	**0.29**	**0.44**	**0.36**	**0.29**	**0.30**	**0.41**	**0.40**
14. Mattering														–	**0.70**	**0.48**	**0.37**	**0.40**	**0.37**	**0.44**	**0.46**	**0.46**	**0.41**	**0.42**
15. Sense of Purpose															–	**0.43**	**0.50**	**0.36**	**0.33**	**0.45**	**0.35**	**0.44**	**0.46**	**0.44**
16. Relational Motivation																–	**0.32**	**0.29**	**0.46**	**0.38**	**0.39**	**0.33**	**0.37**	**0.43**
17. Religious Meaning-making																	–	**0.29**	**0.22**	**0.39**	**0.19**	**0.32**	**0.33**	**0.26**
18. Community Support																		–	**0.34**	**0.33**	**0.34**	**0.32**	**0.32**	**0.33**
19. Compassion																			–	**0.26**	**0.33**	**0.27**	**0.40**	**0.37**
20. Group Connectedness																				–	**0.29**	**0.32**	**0.33**	**0.33**
21. School Climate																					–	**0.32**	**0.32**	**0.51**
22. Social Support Received																						–	**0.53**	**0.39**
23. Social Support Seeking																							–	**0.36**
24. Teacher Engagement																								–

Note: Italics indicates significance at 0.05 level. Bold indicates significance at 0.01 level. The gender variable was dichotomous, with a higher value corresponding to "female."

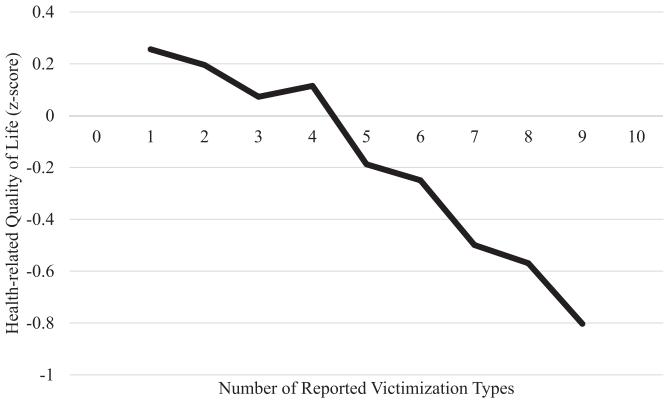

Fig. 2. Health-related quality of life by number of youth victimizations (poly-victimization). Note: Lined smoothed with rolling averages.

free lunches in school, or median county income. As predicted, HRQOL was significantly positively correlated with all psychological and social strengths, ranging from 0.10 to 0.41, with an average *r* of 0.25.

Unique predictors of health-related quality of life

A hierarchical logistic regression was conducted to determine which risk and protective factors showed unique associations with past-month HRQOL. See Table 3. The results are presented in blocks to show the variance associated with each category of demographics, adversities, and strengths. Neither age nor gender were significantly associated with HRQOL in this sample of youth, together only accounting for 1% of the variance in HRQOL. Consistent with prediction, poly-victimization was significantly inversely associated with HRQOL after controlling for other factors, even in this young sample. However, other indicators of adversity were nonsignificant (as they had been in bivariate analyses also). The block of adversities explained 7% of the variance in HRQOL. The block of strengths explained twice as much variance in HRQOL as did adversities (14% vs 7%). In terms of unique contributors to HRQOL, higher levels of two strengths, recovering positive affect and purpose, were significantly associated with better HRQOL. Unexpectedly, one variable, social support seeking, was associated with poorer HRQOL. The total R^2 for the whole model was 21%.

Table 3
Hierarchical logistic regression of adversities and strengths as predictors of physical well-being Physical Well-being.

	Odds Ratio	95% CI
Age	0.86	0.66–1.12
Gender	0.85	0.66–1.10
R^2 demographics only	0.01	
Adversities		
Victimization (JVQ)	0.69*	0.51–0.92
Other adverse life experiences	1.13	0.89–1.45
Receive free lunches	1.00	0.77–1.31
County median household income	1.01	0.78–1.30
	Δ R^2 adversities added	0.07 ***
Poly-strengths	0.92	0.55–1.56
Regulatory strengths		
Recovering positive affect	1.46*	1.05–2.04
Impulse control	1.15	0.84–1.58
Self-reliance	0.97	0.75–1.27
Endurance	0.87	0.62–1.22
Meaning-making strengths		
Sense of purpose	1.57*	1.02–2.43
Relational motivation	1.28	0.88–1.86
Future orientation	1.07	0.75–1.52
Religious meaning-making	0.92	0.69–1.23
Mattering	0.79	0.53–1.19
Interpersonal strengths		
Teacher engagement	1.31	0.93–1.85
Community support	1.26	0.94–1.69
Social support received	1.16	0.84–1.58
Compassion	1.09	0.77–1.56
School climate	0.98	0.70–1.36
Group connectedness	0.92	0.69–1.23
Social support seeking	0.72*	0.52–1.00
Δ R^2 resilience portfolio strengths added	0.14***	
Final r^2 full model	0.21	

* $p < .05$.
*** $p < .001$.

Discussion

The results of this study indicate that the effects of youth victimization on HRQOL can be seen even among young people. Perhaps somewhat surprisingly, relatively high numbers of youth reported impaired health, in some form, in the month prior to the survey. Further, the most highly victimized youth reported HRQOL levels that were, on average, more than a full standard deviation below the mean for non-victimized youth. These findings are consistent with prior research on the burden of victimization (Chan, 2013; Schlack et al., 2013; Tran et al., 2015), while extending previous findings to a young sample (ages 10–21) in the southern U.S.

Further, in addition to the robust association of youth victimization with HRQOL, psychological and social factors were also associated with HRQOL. As hypothesized, every strength in the survey was positively correlated with HRQOL at the bivariate level (range 0.10 to 0.41, average $r = 0.25$). Several strengths were correlated with HRQOL at 0.30 or higher, including recovering positive affect, sense of purpose, mattering, teacher engagement, and poly-strengths (an indicator of the range of one's resilience portfolio).

Multivariate analyses provided several insights not apparent in the bivariate analyses. Multivariate analyses found that a substantial, perhaps even surprising, share of the variance in health-related quality of life—21%–was explained by the combination of psychological and social factors (more than any single factor alone). Further, although poly-victimization remained significant in multivariate analyses, strengths explained twice as much variance in HRQOL as did victimization and other adversities (14% vs 7%). In contrast to the numerous strengths that were significant at the bivariate level, a smaller set of strengths emerged as the best unique predictors of HRQOL. Thus, while considered alone, all 16 protective factors were positively associated with HRQOL, only a smaller subset appears to have unique aspects that are helpful for HRQOL. This smaller subset holds the most promise as targets for future intervention and prevention.

Recovering positive affect, an understudied regulatory strength, showed promise. This concept emerged from our qualitative work as a neglected but important form of emotional regulation. In focus groups and interviews, participants said what helped them cope with adversity was the ability to get back to a good mood after stress, and to regain their ability to laugh at either the situation, themselves, or both. This individual regulatory skill is distinct from simply being in a good mood or experiencing positive affect, a much more widely studied phenomenon, due to widely used measures of mood such as the PANAS (Watson, Clark, & Tellegen, 1988). Although Folkman and Moskowitz (2000) have previously written about the ability to regulate positive emotion from a theoretical point of view, we are aware of no prior empirical research on this topic. Despite some studies on positive affect (e.g., Tugade & Fredrickson, 2004), most prior research on emotional regulation focuses on the management of negative emotions. The capacity to cheer oneself up is a promising protective factor that can be explored further in future work.

The second significant strength in the multivariate analyses was a sense of purpose. Prior work indicated that a sense of purpose was associated with better psychological well-being (Hamby, Grych, et al., 2018)

in an older sample (average age 30), but not associated with HRQOL (Banyard et al., 2017). This result suggests that, for youth, connecting to something larger than themselves and identifying something they can be part of or work towards is important to their physical as well as psychological well-being. Prior work has established that a sense of purpose can be identified in youth as well as adults. In youth, a sense of purpose is often seen as an intention to accomplish something meaningful and a desire to make a difference in the world (Machell, Disabato, & Kashdan, 2016). For youth, a sense of purpose can provide motivation to do well in school or excel in sports, music, or other areas.

The final significant result was in the opposite direction than predicted. Social support seeking was significantly associated with lower HRQOL. We speculate that this measure may have also captured youths' level of stressors as well as coping strategies, because more distressed youth may also seek more social support. Note that the bivariate correlation of HRQOL with social support seeking is significant and positive, indicating that it might be the unique aspects of social support seeking which capture the degree of distress in addition to strengths in willingness and ability to disclose or ask for help.

Strengths and limitations

The results of this study should be considered in light of the strengths and limitations of the project. This study expands the types of strengths that have been assessed in adolescent populations, by including little-studied strengths such as recovering positive affect, group connectedness, and self-reliance. The study also expands information on resilience in low-income communities in the southern U.S. Nonetheless, it would be valuable to replicate these findings in other groups and in other regions of the country and the world. This was a cross-sectional study, which is an appropriate and cost-effective means of exploring new ideas, but the results would benefit from replication in a longitudinal study. The creation and adaptation of numerous self-report measures of strength for youth as young as age 10 is a strength, but the issue of shared method variance and multicollinearity are limitations, and future research could incorporate multiple informants or other data sources, and rely on the data here to identify the most important protective factors to examine in future work. Finally, basing the study on a theoretical framework, the Resilience Portfolio Model (Grych, Hamby, et al., 2015) is a strength, but due to survey length and other resource considerations, we were not able to examine all potentially relevant strengths for resilience portfolios. Further work is needed to replicate these findings, especially for unexpected findings such as the association of more social support seeking with lower HRQOL.

Implications

This study has expanded the range of psychological and social strengths that have been explored in adolescence, with constructs such as recovering positive affect, but more work, especially mixed methods approaches, could be done to further identify factors that help youth thrive despite victimization and other adversity. Future work also needs to continue to adapt or create measures that can be used to assess younger youth, with reading levels and item content that is appropriate for middle and high school youth. The findings also support the idea that helping youth develop their psychological and social strengths is a path to promoting better health-related quality of life.

In terms of prevention and intervention, several brief interventions such as narrative, mindfulness, and social and emotional learning (SEL) have demonstrated impacts on strengths such as sense of purpose and emotional regulation (Adler, 2012; Brown & Ryan, 2003; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Schonert-Reichl & Lawlor, 2010). Narrative exercises, such as writing about one's values, key turning points in one's life, or processing traumatic events, have been shown in numerous studies to help young people process difficult life events and help them develop a stronger identity and sense of purpose (e.g., Hamby, Taylor, Grych, & Banyard, 2016). Narrative exercises can be easily incorporated into many settings, including clinics and schools. Emerging research suggests that some of these interventions may have effect sizes that are similar or better than those for many other therapies, including psychotropic medications (e.g., Bieling et al., 2012). At a minimum, these alternative interventions may be safer, more appealing to many youth, and easier to implement in group settings such as schools. Practitioners need to be more aware of the importance of developing psychological and social strengths for the promotion of better health-related quality of life.

CRediT authorship contribution statement

Sherry Hamby: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Visualization, Supervision, Project administration, Funding acquisition. **Elizabeth Taylor:** Software, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Project administration. **Kimberly Mitchell:** Conceptualization, Project administration, Writing - review & editing, Funding acquisition. **Lisa Jones:** Conceptualization, Project administration, Writing - review & editing. **Chris Newlin:** Investigation, Resources, Project administration, Writing - review & editing, Funding acquisition.

Declaration of competing interest

None.

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