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Hope Matters: Developing and Validating a Measure of Future Expectations Among Young Women in a High HIV Prevalence Setting in Rural South Africa (HPTN 068)

Laurie Ablor¹, Lauren Hill¹, Suzanne Maman¹, Robert DeVellis¹, Rhian Twine², Kathleen Kahn², Catherine MacPhail³, and Audrey Pettifor⁴

¹Department of Health Behavior, UNC Chapel Hill, 331 Rosenau Hall, CB #7440, Chapel Hill, NC 27599, USA

²MRC/Wits Rural Public Health and Health Transitions Research Unit (Agincourt), School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

³School of Health, University of New England, Armidale, Australia

⁴Department of Epidemiology, UNC Chapel Hill, Chapel Hill, NC, USA

Abstract

Hope is a future expectancy characterized by an individual's perception that a desirable future outcome can be achieved. Though scales exist to measure hope, they may have limited relevance in low resource, high HIV prevalence settings. We developed and validated a hope scale among young women living in rural South Africa. We conducted formative interviews to identify the key elements of hope. Using items developed from these interviews, we administered the hope scale to 2533 young women enrolled in an HIV-prevention trial. Women endorsed scale items highly and the scale proved to be unidimensional in the sample. Hope scores were significantly correlated with hypothesized psychosocial correlates with the exception of life stressors. Overall, our hope measure was found to have excellent reliability and to show encouraging preliminary indications of validity in this population. This study presents a promising measure to assess hope among young women in South Africa.

Keywords

Hope; Scale development; South Africa; Young women; HIV

Correspondence to: Lauren Hill.

Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of Interest The authors declare that they have no conflicts of interest.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Introduction

Hope is the wish or desire to have a positive future. It is an example of a future expectancy theorized specifically as an outcome expectancy which promotes the consideration of the most desirable future even if the likelihood of that future is improbable [1]. Hope is thought to motivate individuals to act toward reaching a future goal [2]. Hope can manifest itself cognitively, emotionally, and behaviorally, and can relate to both abstract future expectations and expectations of concrete outcomes [3].

Hope as a psychological construct has been associated with HIV, often in the context of the care and treatment of people living with HIV (PLHIV) [4]. Among PLHIV, hope is important for coping with HIV [5, 6], HIV treatment [7], AIDS dementia [8], and quality of life [9]. Less is known, however, about how hope may affect the prevention of HIV. It may influence sexual risk behaviors and ultimately HIV and related outcomes [10].

Hope has been conceptualized as a positive psychosocial strength influenced by the social environment while protecting against risk [1]. In addition, it is theorized as an important mediator between the risk environment in resource-poor settings and engagement in HIV-risk behaviors [11]. Two studies have empirically demonstrated the relationship between hope and HIV-related risk behaviors in resource poor settings [12, 13], however these studies were conducted in the US in settings with relatively low HIV prevalence. No other studies have been conducted to understand the role of hope in a very high prevalence setting, such as South Africa, among youth who are disproportionately affected by the HIV epidemic.

To measure hope as a psychological construct, researchers have developed scales for different populations, primarily in resource-rich settings such as the US and mainly in clinic or lab-based settings [14, 15]. The most well-established hope scale for use in a general population is the Snyder Hope Scale, which captures *agency* (belief in one's ability start and maintain an action) and *pathways* (belief in one's capacity to find a route to achieve desired goals) [1, 16]. Despite the popularity of this scale, it may have limited relevance for measuring hope in very high HIV prevalence settings, such as rural South Africa, a context which also has high levels of poverty and unemployment. This is because the scale focuses primarily on the cognitive aspects of hope without considering how the context in which one lives shapes hope, and does not explicitly incorporate a focus on future orientation [17]. Furthermore, there are few scales available which have been specifically developed for adolescents [18, 19], and those which exist have been developed specifically for clinical or US high school populations. Snyder's Children's Hope Scale is often used for early adolescents ages 14 and younger [16], and the adult Snyder Hope Scale is used for adolescents ages 15 and older [1]. More scales developed for adolescents in both US and global contexts are needed, as cognitive development and thus also the development of hope persists through adolescence. Hope among adolescents may differ qualitatively that of children or of adults. Like children, the perceived locus of hope may still be held by parents and teachers (i.e. perceptions of adults' perceptions of one's future may be an important manifestation of hope); parent-child interactions are essential for the development of hope [20], as are interactions with teachers who shape children's and adolescents' perceptions about their ability to overcome obstacles and achieve their goals [20]. External parent-

centered locus of hope as compared to internal locus of hope may be stronger than previous thought among adolescents, but internal locus of hope may be more important for adolescents than for children [21]. To capture aspects of hope that are relevant to adolescents in low resource, high HIV prevalence settings, we need a scale that is developed specifically for this age group in such a setting.

5.6 million people in South Africa are infected with HIV [22] and young women are particularly at risk, with more than 13.9 % of women ages 15–24 infected compared to 3.6 % of their male peers [23, 24]. The current study is based in the Agincourt sub-district of Mpumalanga Province, South Africa. This area is characterized by high rates of poverty, unemployment, and circular labor migration. In 2010 HIV prevalence in Mpumalanga was 21.8 % among adults ages 15–49 [25] and prevalence in the study area was 5.5 % among 15–19 year old women, rising to 27 % by age 20–24 years, and reaching 46 % by age of 35–39 years [24].

Understanding young women's hope in South Africa and its relation to their HIV-related risk behaviors may shed light on how to improve HIV prevention initiatives for young women. The purpose of the present study was to develop and validate a hope scale grounded in qualitative research from the communities where we are working, making it culturally and contextually relevant for this setting.

Methods

To develop the scale, we conducted three stages of mixed methods research. First, we used qualitative research to explore meanings of hope among young women and identified the key elements of hope necessary to develop hope scale items. Second, we administered the hope scale items in a survey of participants in the parent trial in which this study was nested. Third, we conducted factor analysis to determine the factor structure of the hope scale and assessed its validity and reliability.

This study was conducted in the context of HPTN 068: *Effects of cash transfer for the prevention of HIV in young South African women* which took place at the South African Medical Research Council and the University of Witwatersrand Agincourt Health and Socio-Demographic Surveillance System (HDSS) site in the rural Agincourt sub-district in Mpumalanga province, South Africa [26]. The study site is located approximately 500 km northeast of Johannesburg. The parent study was structural-level randomized control intervention trial which provided cash transfers to young women ages 13–20 and their families conditional upon young women's attendance in secondary school in order to reduce the incidence of HIV, HSV-2, and sexual risk behaviors [27]. Our research occurred during the pilot and the baseline recruitment stages of parent study prior to the random assignment of the young women into the intervention or control arm.

Development of the Hope Scale

Formative Research and Analysis—To develop the hope scale items, we conducted in-depth interviews and focus groups with young women. We interviewed 20 young women, ages 14–20, half of whom were enrolled in secondary school and the other half of whom had

dropped out and never completed their secondary education. During the interviews, the participants shared how they talked about and thought about hope in their lives. We intentionally sampled participants in and out of school because we anticipated that school attendance may influence young women's hope. The in-school young women had participated in the pilot intervention of the parent study conducted in one of the local high schools. The out-of-school participants lived in the same villages as the in-school participants, and they were selected randomly from the Agincourt HDSS database. In addition, we randomly selected five parents/guardians of the 20 young women to interview, and one-ninth grade life-orientation teacher at the secondary school where the pilot took place. All interviews followed a semi-structured in-depth interview guide that asked about young women's (or parents' and teachers' perceptions of young women's) definitions of hope, experiences involving hope, barriers to hope, expectations for their future, and thoughts on how hope influences sexual risk behaviors. Two native xiTsonga-speaking female interviewers from Agincourt conducted the interviews, and also transcribed and translated the audio-recorded interviews into English.

The first author and the two interviewers discussed the transcripts to identify how the interview participants defined hope and expectations for young women's futures. Based on these findings, the interviewers conducted two focus-group discussions—one with seven of the ten in-school participants and one with six out of the ten out-of-school participants—to verify the interpretations of young women's hope, and to generate consensus about the focus group participants' definitions and understandings of hope. We performed content analysis on the interviews and focus group discussions, using Atlas.ti v6, to define hope, to identify the conceptual domains that comprise hope, and to develop the wording of individual hope items to be used in the HPTN068 trial baseline and follow-up surveys.

Item Development—After analyzing the interviews and focus groups, we developed the hope scale items and domains following the four steps of scale development [28]. First, we synthesized the hope literature and findings from the formative research to define hope and relevant hope domains. As a result, we identified three domains of hope: (1) 'anticipation of a positive future' to reflect the importance of consideration of the future [15]; (2) 'personal motivation to achieve goals' based on the agency and goal-setting that one needs to be hopeful [29]; and (3) the 'influence of others on hope' to capture hope's dependence on interconnections with others [30]. These domains closely reflect three of the four key elements identified in one review of hope [31]. We omitted the domain for the need to escape from despair because it was not salient among the formative research participants. Second, we generated a list of draft items for each domain, 30 items per domain. Taking the definitions of each domain generated from the in-depth interviews and focus groups, we generated a pool of items for each domain which we felt capture each demension of the domain. To create this comprehensive list of draft items for each domain we used participants' words from the interviews (e.g., *I trust that I will achieve the goals I set for myself*), modification of existing items from other scales (e.g., *I believe that good things happen to me*), and original item wordings (e.g., *I am careful about what I am doing now because it could affect my plans for the future*) that reflected ideas raised in the interviews. Third, we cut items from the draft list by discarding items that had ambiguous meanings, did

not map onto one of the three hope domains, or did not translate well into xiTsonga. Local interviewers and authors reviewed the item pool to select the final 24 which best captured the dimensions of each of the three domains as represented in the qualitative interviews and focus groups. Finally, we administered the final pool of 24 hope items during the baseline survey of the parent study.

Hope Scale Administration

Participants and Recruitment for the Parent Study—The parent study randomly selected households in which young women ages 13–20 resided using the Agincourt HDSS census data. In each selected household, researchers invited one eligible young woman to participate in the parent study. To be eligible, the young women had to live in the Agincourt HDSS study villages, be currently enrolled in grades 8–11 at a secondary school in the Agincourt HDSS, be willing to provide consent, have a parent/ guardian willing to give consent to the study (if under 18 years), plan to live in the study villages for at least three years, be literate in order to complete the survey, and have the documentation required to open a bank account to receive the intervention’s cash transfer.

Survey Data Collection—The baseline survey was administered between March 2011 and December 2012 in 28 villages in the Agincourt HDSS. It contained 14 modules, comprising general household information, education, sexual partnerships, health and fertility, consumption, relationship beliefs, intimate partner violence, employment and finance, HIV knowledge, family support, condom-use self-efficacy, mental health, hope, and friendships. Trained female survey interviewers from the Agincourt HDSS villages administered the surveys using ACASI. Participants had the option to complete the survey in either English or xiTsonga. All 2533 enrolled participants completed the baseline survey. After completing the survey, young women were randomly assigned to the cash transfer intervention arm or the control arm.

Analysis Procedures

Analytical procedures to determine the factor structure of the hope scale and validate it with related measures were conducted using SAS version 9.4 [32]. Descriptive statistics, including frequency (n) and percentage, or mean (M) and standard deviation (SD) of all the validation variables, and the mean and response distributions of all the hope items were examined.

Factor Analysis—Using Classical Test Theory, we determined the number of unique dimensions comprising hope and the distribution of the items across the dimensions using two complimentary factor analytic methods. Both methods use eigenvalues (i.e., the amount of shared variance in a set of items making up a factor) to determine the number of factors to extract. The first method is the scree test, which plots the relative value of the eigenvalues for each factor. Factors that lie above the point where the eigenvalues become horizontal on the plot (i.e., the elbow) capture substantial variance in the items and thus are candidates for retention in the factor structure. The second method is parallel analysis, which runs simulations on multiple random datasets to generate simulated eigenvalues that can be compared to the actual eigenvalues resulting from the data. The simulated eigenvalues

indicate the amount of random variance in the data that would be expected by chance, and therefore actual eigenvalues that exceeded the simulated eigenvalues are candidates for retention in the factor structure [28]. Using these two methods, we conducted exploratory factor analysis in two random subsamples (each containing 400 cases) of the larger baseline dataset, as well as in the entire baseline dataset to test if the factor structure comprised three proposed hope domains and to assess how the items loaded on the factors.

After determining the number of factors to extract, items for the single resulting factor were retained if the primary factor loadings were greater than 0.70. Using an iterative process, we deleted items from the hope measure that did not meet this criterion until all the retained items demonstrated acceptable factor loadings. After retaining the items that met this criterion, we assessed the internal consistency of the final items using Cronbach's alpha.

Hope Scale Validation Measures—Based on hope theory, previous hope validation studies, and empirical findings, we assessed the validity of the developed hope scale using constructs related to hope. We selected five categories of validation constructs: (1) education; (2) mental health; (3) life stressors; (4) social support; and (5) behavioral risks. Evidence from the literature supported our selection of each construct. For each test of construct validity, we calculated its Pearson correlation with hope. The hypothesized direction and magnitude of each variable's relationship with hope is shown in Table 1. Below is the description of the variables used to establish construct validity with the hope measure.

Education—We measured young women's education using their reported '*grade*' in school, which ranged from 8th to 11th grade.

Anxiety—was measured with 14 of the 29 items of the Revised Children's Manifest Anxiety Scale (RCMAS2) [33]. Example anxiety items included 'I worry a lot of the time' and 'I feel alone even when there are people with me'. Response options were '0' = no and '1' = yes. Response to the 14 items were summed and averaged, ranging from '0' for no anxiety and '1' for high anxiety (Cronbach's $\alpha = .86$).

Depression—was measured using the Children's Depression Inventory (CDI) [34], which was modified from 27 to 10 items. Participants were asked to choose among three response categories that most represented them, such as 'I am sad once in a while,' 'I am sad many times,' and 'I am sad all the time.' The responses were scored 1 for the least depressive category, 2 for the middle depressive category, and 3 for the most depressive category. We calculated a mean score over the 10 items ranging from 1 for no reports of depression to 3 for high depression. The internal consistency of CDI was borderline acceptable (Cronbach's $\alpha = 0.65$).

Life Stressor Variables—'*Loss of a parent*' was assessed if a participant's mother or father had died in the previous year. Participants were asked whether their mother or father was still alive, and if not when that parent died. Using this information, we created an indicator variable for '*loss of parent*' (neither mother nor father died in approximately the last year/at least one parent died in the last year). To assess whether participants had '*moved*

households’ in the past year, we asked: ‘have you moved households within the last 12 months’ (yes/no).

Social Support Variable—We calculated the mean score from a four question index asking how often an adult family member: (1) checks that school work is complete; (2) helps with school work; (3) discusses things studied in class; and 4) discusses marks/-grades (never, sometimes, always). Scores for ‘*family school support*’ ranged from 1 (no support on any item) to 3 (full support on all items) and had an internal consistency reliability of $\alpha = 0.75$.

Behavioral Health Risk Variables—‘*Condom use self-efficacy*’ was based on six items that were modified from a condom use self-efficacy scale [35]. Item examples include ‘I can ask a new partner to use condoms’ and ‘I can refuse sex when I don’t have a condom available.’ Response categories followed a 3-point Likert scale, ranging from 1=‘do not agree at all’ to 3=‘agree a lot’. We calculated a mean score ranging from 1 to 3. The condom-use self-efficacy scale had a Cronbach’s alpha of .87 in this sample. To assess if the young women were ‘*ever pregnant*,’ we asked about their pregnancy history—‘have you ever been pregnant’ (yes/no). For ‘*alcohol use*’, we asked respondents how often they drink, with responses ranging from never to daily. We collapsed the responses into three categories—never drinkers, rare drinkers (drink once a month or less), and occasional drinkers (more than once a month).

Missing Data Analysis—Five cases were missing every hope item. An additional six cases were missing more than a third of the hope items along with several other study variables. These eleven cases were dropped entirely from the analysis (N = 2522). We calculated correlation coefficients, conducted factor analysis, created mean scores for all scale measures and correlated validation constructs with hope on cases with no missing data.

Ethical Review—The study was approved by the ethical review committees at the University of North Carolina at Chapel Hill and the University of the Witwatersrand in Johannesburg, South Africa. Individual written informed consent was obtained from all study participants. Young women ages 13–17 completed informed assent and parents/guardians also consented to their daughter’s participation in the study, while young women ages 18–20 provided informed consent for their own participation.

Results

Description of the Sample

2522 young women participated in the baseline survey and completed all hope items. The descriptive statistics for the study sample, including education, mental health, life stressors, social support, and behavioral risks variables are shown in Table 2. Participants’ age ranged from 13 to 20, with a mean of 15.5 years (SD = 1.7). About a quarter of the sample were in each grade, 8th–11th. Most participants did not report anxiety (M = 0.3, SD = 0.3, range 0–1) or depressive symptoms (M = 1.3, SD = 0.3, range 1–3). A small proportion of the sample had experienced a substantial life stressor in the last year; 5 % of the young women had lost a parent and 3 % had moved households. The average score on family social support was 2.3

(SD = 0.5, range 1–3), and the average condom-use self-efficacy score was 1.7 (SD = 0.7, range 1–3). 8.9 % of young women had ever been pregnant. Nearly all the young women reported never drinking alcohol (91.1 %).

Development of the Hope Items

Using the formative research findings, we developed 24 hope items encompassing the three hope domains—eight items for personal motivation to achieve goals (PM1–PM8), ten items for anticipation of a positive future (FA1–FA10), and six items for the influence of others on hope (IO1–IO6). Response options for each item used a four-point Likert response ranging from ‘1’ for totally disagree to ‘4’ for totally agree. For every hope item, a large majority of the respondents—75 % or more—reported being hopeful (agree) or very hopeful (totally agree) (Table 3).

Factor Structure

The eigenvalues comparing the study sample to the simulated datasets created through the parallel analysis are shown in Fig. 1. The results of the scree test revealed one factor above the elbow, indicating a one-factor solution. The parallel analysis suggested that there were two factors with actual eigenvalues larger than the simulated eigenvalues, although the actual eigenvalue for the second factor was marginally above its simulated eigenvalue (1.7 vs 1.5 respectively). The items that primarily loaded on both the first and second factor represented each of the three proposed hope domains, indicating that there was not a conceptual explanation distinguishing the factors. Because of the evidence—in the two $n = 400$ samples and the entire sample—provided by the scree plot, the parallel analysis, and the lack of conceptual distinction between the items that loaded on the first and second factor, we adopted the more parsimonious and plausible single-factor solution. Through an iterative process of excluding items that loaded below 0.70 on the single factor, we reduced the number of items to 15. Cronbach’s alpha, or the internal consistency reliability for the 15-item hope scale, was high at 0.95. For the sake of scale parsimony, coupled with conservation of high reliability, we further reduced the final hope measure to 12 items by dropping items with the lowest factor loadings, while maintaining Cronbach’s alpha at 0.95. The final 12 items and their factor loadings based on the final single-factor solution are included in Table 4.

Construct Validity Testing

Based upon the final set of items, the mean hope score was 3.4 (SD = 0.6, range = 1.0–4.0, IQR = 3.0–3.9). For testing construct validity, we created a mean hope score from the 12 final items ranging from ‘1’ for total disagreement to ‘4’ for total agreement with all the hope items. To assess construct validity, the Pearson correlations between the key variables and the mean hope score are shown in Table 5. We expected a positive correlation between grade and hope, and participants who were in a higher grade had significantly more hope ($r = 0.10$; $p < .001$). Our hypotheses for the associations of hope with mental health and social support variables were confirmed. Anxiety ($r = -0.15$; $p < .001$) and depression ($r = -0.35$; $p < .001$) were negatively associated with hope. Family school support was positively associated with hope ($r = .12$; $p < .001$). The relationship of hope with the behavioral risk variables partially followed the hypothesized directions. As predicted, condom use self-

efficacy was positively associated with hope ($r = 0.15$; $p < .001$), but the strength of the relationship was stronger than expected. Having ever been pregnant was negatively associated with hope ($r = -0.13$; $p < .001$) as expected, as was alcohol use ($r = -.04$; $p = .04$). Although we hypothesized that life stressors would be negatively correlated with hope, no relationship was found. Loss of a parent ($r = .03$; $p = .10$) and household move in the last year ($r = .01$; $p = .89$) were not associated significantly with hope.

Discussion

This study provides a measure of hope, which is the first to be developed specifically for use in a high HIV prevalence, resource poor setting. We developed and validated it in a sample of young women in rural South Africa. Overall, the hope measure we created was found to have excellent reliability, to show promising preliminary indications of validity, and to explain an adequate amount of the total variance among the hope items in a sample of rural South African young women in secondary school.

Based on the formative research, we hypothesized three hope domains that informed the development of scale items: personal motivation, anticipation of a positive future, and influence of others. These three domains, however, did not uphold in the factor analysis, which instead resulted in a uni-dimensional factor structure. Two likely explanations exist for why the hope scale only measured a single, uni-dimensional attribute of hope. First, the three hypothesized domains and the accompanying items may not capture distinct enough aspects of young women's hope to comprise separate, unique dimensions in the scale structure, suggesting that the lack of multidimensional factor structure results from poor item selection to represent the domains. Second, it is possible that even though young women in rural South Africa qualitatively discussed experiences related to the various aspects of hope, on a survey the participants may not differentiate between the three dimensions—reflecting elements of personal motivation, future anticipation, and influence of others—as separate components of hope. This second explanation suggests that the distinctions that hope theory has made to identify unique aspects of the construct may not resonate with young women in South Africa. Further research is necessary to explore if the scale items need to be refined to measure distinct aspects of the three hypothesized domains and to assess if young South African women envision hope as a single attribute. Even though the three hypothesized domains were not reflected in the measure, items that represented personal motivation, future anticipation, and influence of others were retained in the final scale. Given the unidimensionality of the scale and the high reliability in this sample, it would likely perform well in shortened form. We finalized the scale items to capture all the theorized dimensions of the hope construct, but it may be possible in future studies to use fewer items given the high reliability of the scale ideally retaining the best performing items representing the three original hypothesized domains.

We found promising preliminary support for the construct validity of the hope scale demonstrated by the pattern of correlations between hope and the hypothesized correlates: socio-demographic, mental health, life stressors, social support, and behavioral risk variables. Generally, the strength of hope's predicted relationships with each of the construct validity variables may have been weakened by the high levels of hope that participants

reported. High endorsement of the hope items suggests there is limited variance to support substantial associations, especially among validation variables that also demonstrate little variance in this sample.

Convergent validity was supported by the direction of the observed correlations of the hope scale with mental health (anxiety and depression) and school grade and family school support, with all relationships significant ($p < .001$). Depression, in particular, is a construct that has been shown to be associated negatively with hope in numerous studies [1], so it is not surprising that the relationship is confirmed here. The magnitude of hope's correlation with anxiety and depression was not as high as in other settings, which ranged from -0.10 to -0.15 in our study, but from -0.40 to -0.60 elsewhere [1]. The magnitude of the correlation in our study may be limited by the lack of validity testing of the RCMAS2 and CDI scales with young women in the Agincourt HDSS, and in the case of CDI, the borderline reliability ($\alpha = 0.65$). For these mental health variables, the magnitude of their relationship with hope also was likely limited due to the high levels of reported hope. Hope's relationship with grade in school was also very significant ($p < .001$) but the magnitude of the relationship was not very strong ($r = .10$).

With regard to behavioral risk variables, our findings support their convergent validity with hope and behaviors related to sexual risk, such as ever having been pregnant, condom-use self-efficacy, and alcohol. Though the association between hope and alcohol use was significant, the correlation was low ($r = -0.04$). Very few participants (2.3 %) drank alcohol more than once a month and generally black female adolescents in South Africa have low rates of alcohol consumption compared to males and to other racial groups [36]. Other types of substance-use may have a stronger association than alcohol with future expectations [37], but use of other substances was too low to examine in this sample. Regardless, the prevalence of young women using drugs in this setting is also likely very low and therefore substance use might not covary much with hope.

Correlations with life stressor variables did not support convergent validity with hope; household movement and loss of a parent did not correlate negatively with hope as predicted. Notably, neither household movement (3.0 %) nor death of a parent (5.0 %) was prevalent in the sample, lessening the likelihood of substantial associations with hope. A single-item indicator of household movement may not capture whether moving had a positive, neutral, or negative impact on participants, depending on the circumstances of the move, and without this additional information it is difficult to theorize how moving would affect a young woman's hope. For death of a parent, how people handle it is influenced by the social context. For example, for some South Africans, it is not culturally appropriate to mourn a death in the family after the burial [38]. Although people may need more time to adjust to such a personal loss, this short public grieving period prescribed by cultural norms may alter how young women who had lost a parent answer questions on the survey, especially items related to hope. Further, the stressful effect of losing a parent may be mitigated if the young woman did not live together with that parent, something we were not able to control for.

There are important limitations of this study that should be noted. First, there was very little variation in the hope scale. For individual hope items, at least 75 % of the sample endorsed that they agreed or totally agreed with all hope items, and on the majority of hope items this agreement extended above 90 %. The hope scale may not be sensitive enough to differentiate the range of hope at higher (more hopeful) levels of the construct, and that the items and response categories need to be refined. Our scale may have adequately captured the extent of hope in the sample, however, if South African young women enrolled in school are generally a hopeful population. Also, people have been shown to rate themselves highly on measures of subjective well-being in six western countries [39, 40], so the high levels of hope in our sample may reflect this positive cognitive bias as well as social desirability. Measuring this bias together with hope could serve as a means to assess the discriminant validity of the hope scale. In addition, the high levels of reported hope may have been affected by the selection of participants into the parent study. In order for young women to be eligible for the study, they needed to be enrolled in secondary school which fosters hope by increasing opportunities for the future. Young women who are not in school are more likely to have fewer future opportunities resulting in less hope. Further, randomization into the conditional cash transfer or control arm occurred immediately after survey completion; young women participants may have reported high hope as a result of anticipation of joining the conditional cash transfer study arm. Because of the low variability in women's responses, there may have been a ceiling effect in the estimated correlations between hope scores and the validation variables presented in Table 5. Our study was not designed to measure the stability of hope over time and further research is needed to assess whether the measure of hope captures a temporary emotional state or a more permanent personality trait. Finally, we developed the hope scale specifically for use with young women enrolled in the conditional cash transfer intervention study, focusing on their experiences in rural South Africa while in secondary school. The current hope scale was not compared against existing hope scales to test for convergent validity. In broadening the applicability of the hope scale, it needs to be tested and validated in other settings and populations, such as with young men, urban residents, youth who are not in school, and adults who have developed beyond adolescence.

Despite these limitations, this study presents a promising measure to assess hope among young women in South Africa. Unlike other measures of hope, this has the advantage of being developed specifically for use in a high-prevalence HIV setting with a population that is at high risk for HIV infection.

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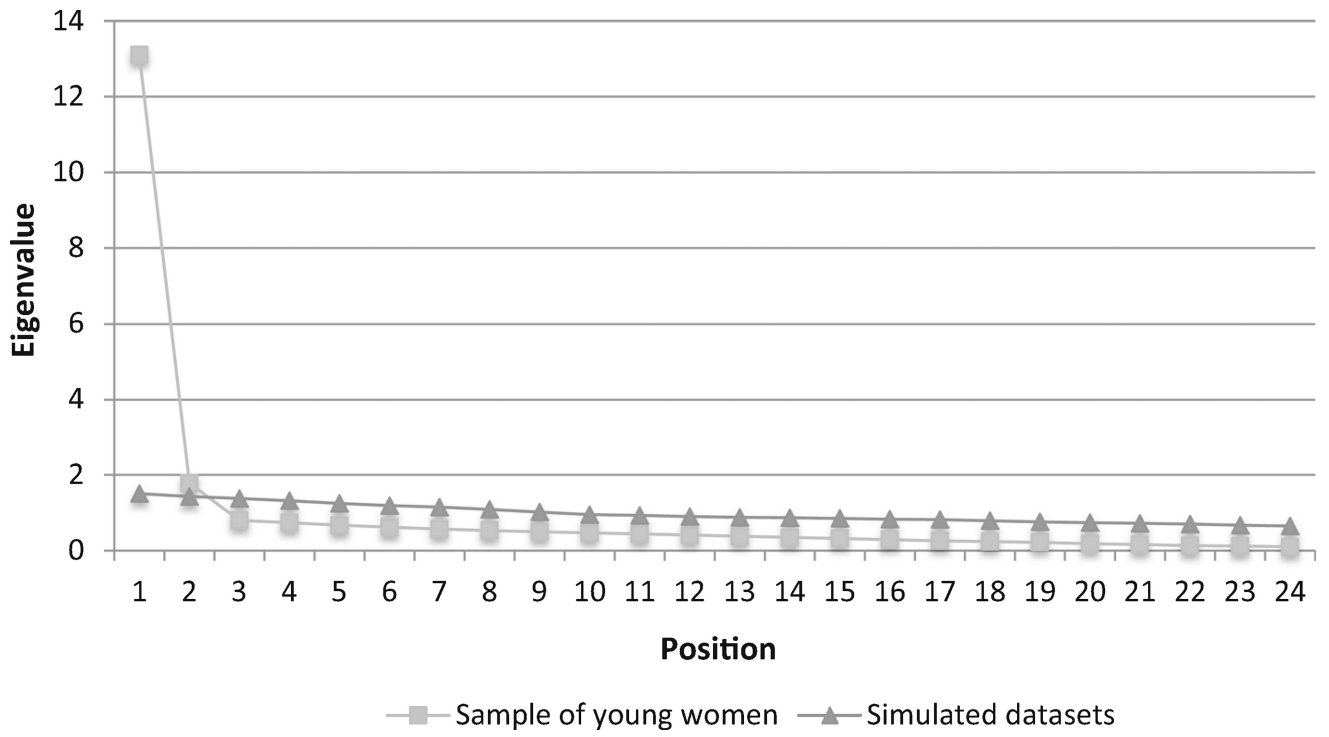


Fig. 1. Eigenvalues for the young women’s sample data and the 100 simulated datasets

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Table 1

Direction and magnitude of hypothesized relationships between validation variables and hope

Validation measures	Predicted direction of association	Predicted magnitude of association
Socio-demographic		
Grade	Positive	Small to moderate
Mental health		
Anxiety	Negative	Moderate
Depression	Negative	Moderate
Life stressors		
Loss of parent(s)	Negative	Moderate
Moved households	Negative	Small to moderate
Social support		
Family school support	Positive	Small to moderate
Behavioral risk		
Condom use self-efficacy	Positive	Small to moderate
Ever pregnant	Negative	Small to moderate
Alcohol use	Negative	Small to moderate

Table 2

Descriptive characteristics of the baseline survey sample of 13–20 year old young women in Agincourt, South Africa (N = 2522)

	n (%)	Mean (SD)	Range	Missing
Sociodemographics				
Age in years		15.5 (1.7)	13–20	
13	278 (11.0)			
14	495 (19.5)			
15	544 (21.5)			
16	532 (21.0)			
17	382 (15.1)			
18	174 (6.9)			
19	90 (3.6)			
20	38 (1.5)			
Year in school				
Grade 8	640 (25.3)			
Grade 9	682 (26.9)			
Grade 10	699 (27.6)			
Grade 11	512 (20.2)			
Mental health				
Anxiety		0.3 (0.3)	0–1	2
Depression		1.3 (0.3)	1–3	10
Life Stressors in Past Year				
Lost a parent	127 (5.0)			
Moved households	75 (3.0)			
Social Support				
Family school support		2.3 (0.5)	1–3	2
Behavioral Risk				
Condom use self-efficacy		1.7 (0.7)	1–3	32
Ever pregnant	223 (8.9)			31
Alcohol use				
Never	2301 (91.1)			
Occasionally (Once a month or less)	168 (6.7)			
Often (More than once a month)	57 (2.3)			

Table 3

Distribution of the hope items

Label	Item	Totally disagree, n (%)	Disagree, n (%)	Agree, n (%)	Totally agree, n (%)
Personal motivation to achieve goals					
PM1	It is easy for me to set goals	321 (12.7)	299 (12.8)	1333 (53.0)	560 (22.3)
PM2	I know that the future is under my control even if things go wrong	153 (6.1)	209 (8.3)	1187 (47.1)	972 (38.6)
PM3	I enjoy thinking about how I am going to achieve what I want in my future	92 (3.7)	103 (4.1)	1137 (45.1)	1192 (47.2)
PM4	I am the kind of person who makes plans for how to reach my dreams	88 (3.5)	148 (5.9)	1188 (47.2)	1093 (43.4)
PM5	I can achieve my dreams if I focus on it	86 (3.4)	103 (4.1)	1157 (45.9)	1176 (46.6)
PM6	I trust that I will achieve the goals that I set for myself	66 (2.6)	69 (2.7)	1169 (46.4)	1214 (48.2)
PM7	It is easy for me to reach my goals	64 (2.5)	110 (4.4)	1305 (51.7)	1044 (41.4)
PM8	I am careful about what I am doing now because it could affect my plans for the future	127 (5.0)	230 (9.1)	1192 (47.3)	971 (38.5)
Anticipation of a positive future					
FA1	I believe that good things happen to me	148 (5.9)	161 (6.4)	1127 (44.6)	1089 (43.1)
FA2	I do not worry too much about problems now- because I believe my life will be better in the future	122 (4.8)	115 (4.6)	1174 (46.5)	1114 (44.1)
FA3	Even when I fail, I keep trying because I know it will be better next time	84 (3.3)	98 (3.9)	1230 (48.8)	1109 (44.0)
FA4	There is nothing that can get in my way of having a good future	93 (3.7)	107 (4.2)	1074 (42.5)	1251 (49.5)
FA5	I trust that I will be able to do everything that I want to do in my future	63 (2.5)	67 (2.7)	1109 (44.0)	1282 (50.9)
FA6	I have more confidence in my future success than others my age	57 (2.3)	107 (4.3)	1168 (46.)	1185 (47.1)
FA7	I believe that the things I am doing now are preparing me for what I want in the future	58 (2.3)	84 (3.3)	1165 (46.3)	1209 (48.1)
FA8	I know that my life will be better in the future	48 (1.9)	67 (2.7)	1107 (43.8)	1305 (51.6)
FA9	I believe that I will be successful even when there are difficulties in my life now	57 (2.3)	73 (2.9)	1168 (46.3)	1227 (48.6)
FA10	I have faith that I will be successful	39 (2.0)	44 (2.3)	918 (47.5)	720 (37.3)
Influence of others on hope					
IO1	My parents or guardians support me to achieve my goals	120 (4.8)	99 (3.9)	1234 (48.9)	1070 (42.4)
IO2	I feel comfortable asking others for help when I need it to reach a goal	93 (3.7)	130 (5.2)	1296 (51.4)	1002 (39.8)
IO3	I will be successful because I know other people like me who have been successful	66 (2.6)	87 (3.5)	1158 (46.0)	1208(48.0)
IO4	My friends and I share the dream to have a successful future	116 (4.6)	196 (7.8)	1188 (47.1)	1022 (40.5)
IO5	The important people in my life tell me that I will have a successful life	64 (2.5)	55 (2.2)	1127 (44.6)	1279 (50.7)
IO6	There are people who can help me when I need guidance to achieve something important to me	68 (2.7)	88 (3.2)	1258 (50.3)	1107 (43.9)

PM personal motivation to achieve goals, FA future anticipation, IO influence of others

Table 4

Factor loadings for hope—the final single-factor solution

Label	Item	Factor loading
FA8	I know that my life will be better in the future	0.887
IO5	The important people in my life tell me that I will have a successful life	0.852
PM6	I trust that I will achieve the goals that I set for myself	0.840
FA10	I have faith that I will be successful	0.835
FA9	I believe that I will be successful even when there are difficulties in my life now	0.828
FA7	I believe that the things I am doing now are preparing me for what I want in the future	0.813
PM5	I can achieve my dreams if I focus on them	0.813
FA5	I trust that I will be able to do everything I want to do in my future	0.807
IO6	There are people who can help me when I need guidance to achieve something important to me	0.801
IO3	I will be successful because I know other people like me who have been successful	0.793
FA6	I have more confidence in my future success than others my age	0.786
PM7	It is easy for me to reach my goals	0.766

Table 5

Construct validity assessment using Pearson's correlation with the mean hope score

Validation measures	Correlation with mean hope	<i>p</i> value
Socio-demographic		
Grade (+)	0.10	<.001
Mental health		
Anxiety (-)	-0.15	<.001
Depression (-)	-0.35	<.001
Life stressors		
Loss of parent(s) (-)	0.03	0.10
Household move (-)	0.01	0.89
Social support		
Family school support (+)	0.12	<.001
Behavioral risk		
Condom use self-efficacy (+)	0.15	<.001
Ever pregnant (-)	-0.13	<.001
Alcohol use (-)	-0.04	0.04

The predicted direction and strength of the correlation of the validation variable with hope is depicted in the parentheses in the first column