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Change Pathways in Indigenous and Non-indigenous Youth Suicide

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Abstract

This study examines the multivariate dynamic relationships among suicide attempts, anxiety and/or depressive symptoms, hope and help-seeking across time in Native Hawaiian and non-Hawaiian adolescents, using data from a five-year longitudinal cohort study ($N = 7,317$). The rate of suicide attempts decreased over time, but this reduction was significantly less among Native Hawaiian youth than their non-Hawaiian peers. There were also significant differences between groups in hope and help-seeking, with Native Hawaiian youth increasing help-seeking and decreasing hope to a greater degree. Youth-centered, cultural approaches to suicide prevention are essential in enhancing well-being in indigenous communities.

Keywords

Suicide Attempts; Native Hawaiian; Help-Seeking; Mental Health

Introduction

Suicide is a serious, and complex preventable public health problem that can have lasting harmful effects on individuals, families, and communities. Since the 1950s, the suicide rate has more than tripled among youth 15 to 24 years old (Curtin, Warner, & Hedegaard, 2016; U.S. Public Health Service, 1999). For every suicide death, 1 in 22 high school age youth attempt suicide (U.S. Department of Health & Human Services, 2012). Some risk factors vary with age, gender, or ethnic group, and may occur in combination or change over time. Rates of suicide death and suicide-related behaviors increase with age, and gender differences widen with age throughout adolescence. Boys have higher rates of suicide death than girls, while older girls have higher rates of suicidal ideation and attempted suicide (Cash & Bridge, 2009).

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Studies in both community and clinical settings indicate that psychiatric disorders, including depression and anxiety, are present in up to 90% of adolescent suicide deaths and attempts (Cash & Bridge, 2009). Anxiety disorders have also consistently been associated with an increase in suicidal behavior (Nepon, Belik, Bolton, & Sareen, 2010). For example, over 70% of individuals reporting a lifetime history of suicide attempt had an anxiety disorder. Recent studies have demonstrated that the presence of an anxiety disorder was significantly and independently associated with having made a suicide attempt (Coughe, Keough, Riccardi & Sachs-Ericsson, 2009; Nepon et al., 2010). In research by our study group (Hishinuma et al., 2017), anxiety and a previous suicide attempt were the best predictors of a future attempt. We found high levels of multicollinearity, particularly with depression. Notably, substance use was not a predictor in the final model.

Expression of loss of hope among youth is rising (Gillham & Reivich, 2004). Conversely, youth perception and realization of hope are important protective factors in emotional well-being. Youth at risk for suicide who indicate hope for change and believe that they possess the abilities or resources to change their situation report suicidal ideation, but do not exhibit suicidal behaviors (Gould, Greenberg, Velting, & Shaffer, 2003). Adolescents with social supports, such as friends, family, extended family, and school staff, are not only more likely to experience an increase in hopefulness, but they are also better able to tap healthy strategies to deal with challenges (Roswarski & Dunn, 2009).

Research suggests that most suicidal youth do not receive mental health care or even talk to an adult about their suicidal thoughts or behaviors, irrespective of sociocultural factors such as gender and ethnicity (Freedenthal, 2007, 2010; Wilson & Deane, 2012). This is further reinforced by community response to suicide behavior, which is often with silence and shame (U.S. Department of Health & Human Services, 2012). As a result, youth at risk for suicide may use harmful coping methods, such as isolation and substance use (Gould et al., 2004). Furthermore, youth at the highest risk for suicide are those who are most likely to avoid seeking help for their potentially lethal thoughts and behaviors (Wilson & Deane, 2010). Suicide prevention efforts seek to reduce the factors that increase the risk for suicidal thoughts and behaviors and increase the factors that help strengthen, support, and protect individuals from suicide (U.S. Department of Health & Human Services, 2012).

While youth suicide remains a relatively rare and tragic event, it is most prominent among indigenous peoples (Harder, Rash, Holyk, Jovel, & Harder, 2012). Suicide death are highest among indigenous youth in the U.S.—70% higher than their Caucasian counterparts (Dorgan, 2010; Else, Andrade, & Nahulu, 2007). Research on developmental trajectories among minority youth has demonstrated a younger age of onset and more sustained rates throughout adolescence and young adulthood (Musci et al., 2015). Data from the Centers for Disease Control and Prevention (CDC, 2015) indicated indigenous high school students have significantly higher rates of suicidality compared to all students. Furthermore, ethnocultural factors can influence suicide risk and protective factors. Researchers have framed the issue in terms of discrete risk factors that are similar across ethnocultural groups, such as neighborhood crime, rural location, and family disruption or teen alcohol use (Collings & Beautrais, 2005). They have also included loss of culture and acculturative stress among the contributory factors driving indigenous suicide. Several studies have concluded that

disruption caused by dramatic cultural changes may account for the increased suicide rates among indigenous groups. For example, Yuen and colleagues hypothesized that key transitions in adolescence may be more difficult for them to negotiate (Yuen, Nahulu, Hishinuma, & Miyamoto, 2000). They found youth with high levels of indigenous cultural affiliation and low levels of assimilation were more likely to attempt suicide.

A number of protective factors has been identified for preventing suicide attempts among indigenous youth, including talking with parents, higher levels of family cohesion, family organization, parental bonding, and community support (Else, Andrade, & Nahulu, 2007; Mackin, Perkins, & Furrer, 2012; Mmari, Blum, & Teufel-Shone, 2010). In their review, Harder and colleagues (2012) found similar patterns among protective factors of suicide ideation and attempts with the strongest buffering effect from high levels of social or familiar support. Promotion of culture had a more profound positive influence for suicide attempts than for suicidal ideation. Communities that preserve their cultural heritage are dramatically more successful in preventing suicide (U.S. Department of Health & Human Services, 2010).

Similar to other indigenous populations across the globe, Native Hawaiians face pervasive health disparities across multiple health and socioeconomic disparities (Look et al., 2014). Native Hawaiian youths have one of the highest risks for suicide-related behaviors among major ethnic groups in the US. Suicide death rates for Native Hawaiians are amongst the highest in the world for youth (Else, Andrade, & Nahulu, 2007). Furthermore, between 2000 and 2010, more than 200 were seen for emergency room visits due to suicide attempts, the highest rate among ethnic minority groups (Matsu et al. 2013). Native Hawaiian and other indigenous adolescents are amongst the highest risk for suicide attempts in the U.S., compared to other major ethnic groups in the nation (Wong, Sugimoto-Matsuda, Chang, & Hishinuma, 2012; Yuen, Nahulu, Hishinuma, & Miyamoto, 2000). These disparities are rooted in historical trauma, with Native Hawaiian language and cultural practices being suppressed by educational policies (Hishinuma et al. 2017). Although great strides have been made in revitalizing Native Hawaiian practices, language, and advocacy since the Native Hawaiian Renaissance in the 1970s, disparities remain.

The purpose of this study is to examine the relationship among suicide attempts, anxiety symptoms, depressive symptoms, hope and help-seeking across time among indigenous youth in Hawai'i. In this study, we hypothesized significant ethnic differences in the role of hope and help-seeking in changes in suicide attempts. Additionally, we purport to find ethnic differences in the degree to which levels of change in depressive and anxiety symptoms occur and influence suicide attempts. The extent to which hope and help-seeking may be found to relate to suicide attempts across subgroups of youth may provide support for more thoughtful inclusion of mental health infrastructure in suicide prevention and intervention strategies.

Methods

Participants

Participants were adolescents from the National Center on Indigenous Hawaiian Behavioral Health's Hawaiian High Schools Health Survey (HSHS) who were part of a five-year longitudinal cohort study ($N = 7,317$) in Hawai'i (Andrade et al., 2006). The HSHS was administered annually to students in grades 9–12 with up to five participating schools on three Hawaiian Islands. The survey was administered at approximately the same time each year at participating schools. Participants recruited in each of five consecutive years and could be enrolled at any administration. The 7,317 adolescents completed a total of 12,284 surveys. For a table of the sample size by school year, high school, and grade level for the five years of data collection, see Hishinuma, Chang, McArdle, and Hamagami (2012).

Students were classified into one of two broad ethnic groups. Indigenous Hawaiian versus non-Hawaiian ancestry was based on questions about the parents' ethnic background. Students whose parents had any indigenous Hawaiian ancestry were classified as "Hawaiians," and all others were classified as "non-Hawaiians." This type of classification is used in Hawai'i given that the majority of Hawaiians are of mixed ancestry. A second grouping was based on the students' self-reported sex (as male or female). These two groupings led to four student-group combinations for those who self-reported their ethnicity and sex ($N = 7,206$ with complete demographic data): (1) Hawaiian boys ($n = 2,297$), (2) non-Hawaiian boys ($n = 1,187$), (3) Hawaiian girl ($n = 2,532$), and (4) non-Hawaiian girls ($n = 1,193$).

Procedures

Parents and students received written notification about the research study prior to administration. Parents who did not want their child to participate in the study returned a postcard. Students eligible for participation were presented with a formal assent on the day of the administration. Students who provided their assent completed the survey in their homerooms under the supervision of their teachers. This type of "passive consent" was approved at the time that the study was implemented (i.e., initiated in 1992). The majority of the surveys was completed by the students within 30–45 minutes. Based on the school enrollments, approximately 60% of the students were surveyed. Separate analyses indicated that a higher proportion of female students were surveyed. In addition, those who were not surveyed had more absences, suspensions, and conduct infractions, and had lower actual grade-point averages (GPAs; Andrade et al., 2006). All procedures were approved by the institutional review board of the University of Hawai'i at Mānoa.

Measures

The survey was developed in collaboration with the National Center for American Indian and Alaska Native Mental Health Research, utilizing the design, methods and measures of their Sequoia High School Health Survey (Ackerson, Wiegman, Dick, Manson, & Baron, 1990; Dick, Beals, Keane, & Manson, 1994).

Self-reported suicide attempts—Reported suicide attempts were measured by a Major Life Events Scale (Andrews, Lewinsohn, Hops, & Roberts, 1993). This scale has one item on suicide attempts. Students are asked to check whether they “tried to commit suicide” in the past six months. Responses were either affirmative (1) or negative (0).

Self-reported anxiety—The Spielberger State-Trait Anxiety Inventory (STAI) is one of the most frequently used measures of anxiety in applied sociocultural research. *State anxiety* (A-State) reflects a “transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity ...” (Spielberger, Gorsuch, & Lushene, 1970, p. 3). The STAI has been found to be a reliable and valid measure of anxiety for local Hawai‘i populations (Hishinuma et al., 2000). For the 20 State items, the students were asked to “Circle the number that best describes how you feel *now*” with a 4-point rating scale (0 = “not at all,” 1 = “somewhat,” 2 = “moderately so,” and 3 = “very much so”). Positively worded items were reverse scored. The composite score consisted of the sum of the 20 items, whereby higher scores reflected higher levels of anxiety.

Self-reported depression—Students were asked to rate their depressive symptoms using the well-known Center for Epidemiologic Studies Depression (CES-D) Scale (Radloff, 1977). Based on our own work with the CES-D (McArdle, Johnson, Hishinuma, Miyamoto, & Andrade, 2001; Prescott et al., 1998), we used the 13-item “depressed affect” factor because it best represented the basic construct of depression. Each item was rated on a 0–3 scale regarding the past week (0 = “rarely or none of the time [0–1 day],” 1 = “some or little of the time [1–2 days],” 2 = “a moderate amount of the time [3–4 days],” and 3 = “most or all of the time [5–7 days]”). The composite score consisted of the mean of the 13 items, whereby higher scores reflected higher levels of depressive symptoms.

Hope—Based on situational hope scales (Darvill & Johnson, 1991; Weinstein, 1980), hope was measured using three items: (1) CES-D, Item 8, “I felt hopeful about the future,” which was not part of the 13-item “depressed affect” subscale (see above). The same rating scale was used (i.e., 0–3). (2) “Compared with persons of your own age and sex, how do you think things are going for you right now? (check one):” 1 = “far better,” 2 = “better,” 3 = “same,” 4 = “worse,” and 5 = “far worse”. And (3) “Compared with now, how will your life be ten years from now? (check one),” using the same rating scale as the previous item. Items 2 and 3 were reverse-scored such that higher scores reflected higher levels of hope.

Help Seeking—Two questions from the HSHS were related to help-seeking strategies. These questions were used to elicit patterns of problem-solving and overall satisfaction with the solution. They were adopted from the ongoing work of Roberts, Lewinsohn, and Seeley (1991) in their longitudinal study of adolescents. (1) The first item consisted of, “Do you discuss any of your problems with any members of your family or friends? Circle only one”: 1 = “Yes, and it helps a lot,” 2 = “Yes, and it helps some,” 3 = “Yes, but it does not help at all,” 4 = “No, I do not have anyone I can talk with about my problems,” 5 = “No, no one cares to hear about my problems,” 6 = “No, I do not care to talk about my problems with anyone,” and 7 = “No, I do not have any problems.” For purposes of the analysis, the seven

individual choices were recoded as follows: 3 = Yes, discussed problems (Choices 1–3); 2 = No problems (Choice 7); and 1 = No, did not discuss problems (Choices 4–6). (2) The second item consisted of, “Have you had any serious personal, emotional, behavioral, or mental health problems for which you felt you needed special help or counseling during the past 6 months? Circle only one”: 1 = “Yes, and I did seek special help,” 2 = “Yes, but I did not seek special help,” 3 = I have had very few personal problems of any serious concern,” and 4 = “I have not been bothered at all by personal problems during the past 6 months.” These were recoded as follows: 4 = Choice 1; 3 = Choice 2; 2 = Choice 4; and 1 = Choice 3. Higher scores reflected higher levels of help-seeking behaviors

Data Analyses

The large sample size and multiple repeated measures of all constructs through adolescence provided the opportunity to apply sophisticated statistical techniques. Contemporary longitudinal dynamic structural equation models (Ferrer & McArdle, 2010; McArdle, 2009) were used to analyze the multivariate dynamical relationships among anxiety symptoms, depressive symptoms, help seeking, hope and suicide attempts with MPlus, Version 6 (Muthén & Muthén, 2011). Typically, the dynamical models involve two inter-related variables to examine a temporal effect on change (Ferrer & McArdle, 2010). In our dynamical model, four sets of repeated measures are simultaneously analyzed to decipher if change in one construct occurred due to the past influence of any of four constructs. Figure 1 includes the path diagram of the quaternary dynamic system of the four constructs.

Dynamic modeling starts with assuming that attributes of behavior from different domains change in some coordinated or deterministic way across time. Thus, the dynamic system specifies a conceptual model of a change or rate of change as a dependent variable. McArdle (2001) and McArdle and Hamagami (2001) introduced the latent change score model to examine how a system of changes in behavior from different domains are predicted deterministically. The latent change score model is structured to specify how changes in different latent traits are mutually influenced by previous states of these traits. In general, a latent change is defined as a linear difference between the current state and the immediately preceding state of the latent trait. Characteristics of a multivariate dynamic system via the latent change score model can be easily examined through structural equation modeling (McArdle, 2009).

Examination of the bivariate “coupling” effects allows for causal inferences to be made between Variable 1 in Time 1 leading to Time-1-to-Time-2 changes in Variable 2, as well as Variable 2 in Time 1 leading to Time-1-to-Time-2 changes in Variable 1. The quaternary-variate system of latent change scores includes temporal interrelationships among four latent change scores. Each latent change score is influenced by one self-feedback effect of the previous state of its own, three coupling effects by previous states of co-variables, and a constant. As an example for a latent change score of suicide attempt, we regressed a latent change of suicide attempt ($\Delta \text{sui}[t]$) on the previous state of suicide attempt ($\text{sui}[t-1]$) with a self-feedback effect (β_{sui}), on the previous state of psychological symptom ($\text{sym}[t-1]$) with a coupling effect ($\gamma_{\text{sui,sym}}$), on the previous state of help seeking ($\text{help}[t-1]$) with a coupling effect ($\gamma_{\text{sui,help}}$), on the previous state of hope ($\text{hope}[t-1]$) with a coupling effect ($\gamma_{\text{sui,hope}}$),

and on a constant (s_{sui}). Concurrently, a latent change of psychological symptom, of help-seeking, and of hope were defined by its own self-feedback from the immediate past, and three coupling effects of co-variables in the system.

All longitudinal and cross-sectional data were used, including incomplete data, in order to provide the best estimate of the parameters of change as if everyone had continued to participate (McArdle & Bell, 2000). Contemporary techniques of imputation of incomplete data were applied using Full Information Maximum Likelihood (FIML), which has been shown to produce unbiased parameter estimates and standard errors under Missing At Random (MAR) and Missing Completely At Random (MCAR; McArdle & Hamagami, 1992). For this study, the majority of the missing data was due to our sampling strategy with the goal of oversampling Hawaiians and obtaining data from Grades 9–12 for certain cohorts, and not due to systematic biases of concern such as attrition (Hishinuma, Chang, McArdle, & Hamagami, 2012). In computational terms, the available information for any participant on any data point was used to build up maximum likelihood estimates that optimized the model parameters with respect to any available data.

Results

Descriptive Statistics

Table 1 shows the descriptive statistics for variables measured at Time 1 for the total sample ($N = 7,206$ who self-reported their ethnicity & sex), and for non-Hawaiian ($N = 2,377$) and Hawaiian groups ($N = 4,829$). At Time 1, Hawaiian youth self-reported significantly higher levels of anxiety and depressive symptoms, and suicide attempts (in the past six months) as compared to non-Hawaiians. Non-Hawaiian adolescents self-reported significantly higher levels of help-seeking behaviors as compared to Hawaiians.

For both Native Hawaiians and non-Hawaiians, there were overall declines in rates from Time 1 to Time 4, with greater declines among non-Hawaiians (4.6% decreasing to 2.6% for Native Hawaiians vs. 3.6% to 1.0% for non-Hawaiians at Time 1 and Time 4, respectively). See Figure 2.

Quaternary Latent Change Score Model

We examined dynamical characteristics that involved four variables (quaternary-variate) of interest, i.e., psychiatric symptoms, help-seeking, hope, and suicide. Our focus was to learn how these four variables were inter-related longitudinally. Results of the overall quaternary latent change score model are summarized in Table 2. From this, we can formulate an expected dynamical system as follows:

$$\begin{cases} \Delta sui[t] = -.044 - 1.053 sui[t-1] + .983 sym[t-1] - .120 help[t-1] - .687 hope[t-1] \\ \Delta sym[t] = -.030 - 1.101 sui[t-1] + .211 sym[t-1] + .685 help[t-1] - .331 hope[t-1] \\ \Delta help[t] = -.049 + .050 sui[t-1] + 1.258 sym[t-1] - 1.311 help[t-1] - .651 hope[t-1] \\ \Delta hope[t] = .074 + .234 sui[t-1] + .894 sym[t-1] - .244 help[t-1] - .714 hope[t-1] \end{cases}$$

where Δ = a latent change score, t = current time, $t-1$ = previous time, sui = suicide attempt, sym = psychiatric symptoms, $help$ =help seeking. The fit statistics were root mean square error of approximation [RMSEA] = .054, df = 107, N_{total} = 7,298 for overall.

The overall results for the prediction of change in suicide attempts and change in help-seeking were as expected. For change in suicide attempts, higher levels of hope and help-seeking led to decreases in suicide attempts, while higher levels of symptoms led to increases in suicide attempts. For change in help-seeking, higher levels of suicide attempts and symptoms led to increases in help-seeking, while higher levels of hope led to decreases in help-seeking.

Somewhat more complex relationships were noted for change in symptoms and change in hope. As expected for change in symptoms, higher levels of hope led to decreases in symptoms. However, higher levels of suicide attempts led to decreases in symptoms, and higher levels of help-seeking led to higher levels of symptoms. Contrary to expectations for change in hope, higher levels of suicide attempts and symptoms led to increases in hope, and higher levels of help-seeking led to decreases in hope.

Quaternary Latent Change Score Model for Hawaiian and non-Hawaiian Youth

We also performed the multiple-group quaternary-variate latent change score model for non-Hawaiian and Hawaiian groups (see Table 2). The fit statistics were RMSEA = .052, df = 157, $N_{Non-Hawaiians}$ = 2,378 and $N_{Hawaiians}$ = 4,827. We found mainly similarities in dynamical systems between Native Hawaiian and non-Hawaiian youth regarding how change scores were influenced by the past behavioral patterns for the four domains. While the difference was small, past suicide attempt led to increased hope among non-Hawaiian youth but decreased hope among Native Hawaiian youth.

Discussion

The vast majority of youth in our study did not report suicidality, even when they experienced symptoms of anxiety and/or depression. Furthermore, suicide attempts decreased as grade level increased, suggesting youth were generally better able to cope as they progressed through adolescence. An increasing body of research, including research among indigenous youth, has documented that, despite exposure to multiple risks and adversity, most youth do not develop suicidality or other behavioral problems (Carlton et al., 2006; Werner & Smith, 1982, 1992). Optimism and hope have been shown to buffer adversity.

We found that both Hawaiians and non-Hawaiians who reported increased symptoms and previous suicide attempts increased their willingness to seek help, although the effects were not strong. This is in contrast to other studies that show adolescents who engage in suicidal behaviors are less likely to seek help from others (Gould et al., 2004; Yakunina, Rogers, Waehler, & Werth, 2010) and have a largely unmet need for access to mental health services (Simpson, Scott, Henderson, & Manderscheid, 2002). At the same time, more than 80% of suicidal youth tell someone about their risk (Clark & Fawcett, 1992). Gatekeeper training programs increase knowledge of suicide risk factors and warning signs among natural

helpers and provide the necessary skills to identify and refer youth to mental-health services (Bean & Baber, 2011). Gatekeeper programs may be more important for indigenous youth given adolescents from non-Western populations have been shown to be more willing to seek help within the family than Western populations, and to find discussing their problems with others helpful (Atkinson, Whiteley, & Gim, 1990; Nahulu et al., 1996; Narikiyo & Kameoka, 1992). However, these programs must ensure cultural relevance (Chung-Do et al., 2016)

A modest change in increasing hopefulness was detected between Hawaiian and non-Hawaiian youth who reported high levels of symptoms or had attempted suicide, with Native Hawaiians reporting less hopefulness. This could not be accounted for by the increase in help-seeking. Probable, and potentially more important, family, peer and community influences that are not included in the models may improve our understanding of these complex interactions. Although Hawaiians were once recognized as healthy and robust communities, centuries of colonization by western countries, oppressive policies, and the spread of infectious diseases have contributed to the health disparities and inequities that are seen today, through the loss of land and cultural practices and the lack of access to educational and socioeconomic opportunities that are connected with the indigenous cultural values (Kaholokula, 2009; Ka'opua, Braun, Browne, Mokuau, & Park, 2011; McCubbin & Marsella, 2009; Meyer, 2001; Panapasa, Mau, Williams, & McNally, 2010). The intergenerational effects of historical trauma can be seen in the findings of this study where the loss of hope had a longer lasting effect on Hawaiian youth. The loss of hope is reflected in the Mayeda, Chesney-Lind, and Koo (2001) study that highlights the negative stereotypes and the lack of role models that ethnic minority youth in Hawai'i face in the educational setting. In our work, we also found that the vast majority of youth participants are willing to candidly and insightfully discuss suicide and its impacts on their communities, and how differential treatment in the school system, the lack of role models, and negative societal expectations shape their perceptions of future opportunities and limitations. Based on their willingness to engage in such discussions, qualitative work is needed to better understand the nuances of youth's everyday experiences associated with suicide. Additionally, youth want to be more than a cursory representation; thus, increasing youth's voices should be considered fundamental.

The importance of inspiring hope among Hawaiian youth necessitates culturally relevant suicide prevention strategies, requiring a broad-based community commitment. From an indigenous Hawaiian perspective, strengths-based approaches enhance existing assets and relationships in these families and communities. Studies have shown that youth who feel connected to their families, schools, or communities have a lower risk for suicidality (Hooven, Snedker, Adams, Thompson, 2011; Maimon & Kuhl, 2008; Whitlock, Wyman, & Moore, 2014), including studies among indigenous and Native Hawaiian youth (Borowsky, Resnick, Ireland, Blum, 1999; Chung-Do et al., 2015; Wyatt et al., 2015). Integrating culturally proscribed norms in purposeful ways can facilitate a positive sense of belonging to a valued community (Mannarini & Fedi, 2009). Communities can unite around a common goal of suicide prevention, linking cultural meanings that maintain and strengthen their group, social morals, and ethics.

Comprehension of local, traditional, indigenous perspectives of suicide and well-being enhances the knowledge of existing evidence that suicide determinants are valid for indigenous youth (Else, Andrade, & Nahulu, 2007; Wilson & Rosenberg, 2002; Yuen, Nahulu, Hishinuma, & Miyamoto, 2000). Studies among American Indians/Alaska Natives show a relationship between attenuated suicide rates and community ties to traditional values, as well as fewer suicides related to community involvement in health, education, and cultural services (Berlin, 1987; Chandler & Lalonde, 1998). A review of prevention programs for American Indian/Alaska Native communities concluded that programs work best if they are culturally relevant and developed with community input (Middlebrook, LeMaster, Beals, Novins, & Manson, 2001). Community involvement in developing policies and programs makes a significant difference in well-being because it reinforces the contemporary discourse in many indigenous communities that *our culture is our treatment* (Gone, 2008; Kral et al., 2009; Trinidad, 2009). Involved communities can evoke their history and traditions, then develop—with technical consultation from academic researchers and community advisors—culturally relevant, locally directed healing interventions that integrate scientific principles that determine effectiveness and efficacy (Chung-Do et al., 2016).

There are limitations of the sample and the modeling approach used. While the data were from the 1990s, there is no historical reason to believe that the results would be different at present. The participation rate was lower for boys and for those with more at-risk behaviors, such as absences, trancies, suspensions, conduct infractions, and lower GPA. The potential effects of this type of sample bias should be considered when interpreting the findings and implications. However, the overall participation rate of 60% was relatively high (Esbensen, Miller, Taylor, He, & Freng, 1999), especially for a minority adolescent population. Given that our research design was essentially observational, we only tentatively proposed causal relationships herein. However, one of the advantages of our research design was the longitudinal cross-sequential nature that allowed us to make valid inferences about the temporal relationships among the variables in question. The statistical model used presumes invariance at several levels and we assumed a dynamic process that takes the same amount of time no matter what pair of grade levels we were considering. We recognize that it is possible that more changes occur between some grade levels and that the changes between longer times are not a simple accumulation. The data we used were somewhat limited as well. For example, the assumption of invariance over different patterns of incomplete data was likely to be incorrect to some degree, and we know that specific forms of self-selection effects can lead to parameter bias (McArdle & Hamagami, 1992). However, as stated prior, the majority of the missing data was not due to biases of theoretical concern, but due to the sampling strategy (i.e., oversampling of Native Hawaiian adolescents, assuring certain cohorts would have data for all four grade levels).

This study provides support for clinical and preventive strategies that can improve well-being and instill hope. Effective interventions identify positive resources and abilities in youth, in their families and in their communities, and then systematically create healing strategies (Damon, 2004; Kral et al., 2009; Larson, 2000; Lerner et al., 2011). A positive youth development approach can help adolescents utilize their strengths and develop skills that will allow them to thrive as productive members of their community by emphasizing

competence, confidence, connection, character, caring, and contribution (Lerner et al., 2011). Specific to suicidality, two large studies among indigenous youth have shown that increasing protective factors was far more effective in reducing suicide attempts than reducing risk factors (Borowsky, Resnick, Ireland & Blum, 1999; Mackin, Perkins, & Furrer, 2012). Our suicide prevention project in rural, primarily Native Hawaiian communities focused on youth empowerment, relationship and team-building activities, suicide prevention training, and community awareness events through safe-messaging approaches, and highlighted the importance of involving youth leaders in youth suicide prevention efforts (Chung-Do et al., 2015). Through such programs, youth provide valuable cultural insights and creativity to youth suicide prevention initiatives that, if acknowledged, can become powerful modes of instilling hope in our communities (Wexler & Gone, 2012; White, 2012).

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Figure 1.

An abbreviated path diagram of the quaternary-variate latent change score models. (Note: Time invariant constants are omitted for visual clarity. Sui = suicide attempt, Sym = anxiety and depressive symptoms.)

Figure 2.

Annual percentage of suicide attempts among Native Hawaiian students and non-Hawaiian students by grade level across study period.

Table 1

Descriptive statistics at Time 1 for the total sample ($N = 7,206$), non-Hawaiian youth ($N = 2,377$) and Native Hawaiian youth ($N = 4,829$)

<i>Variable At Time 1</i>	<i>Total Sample</i>		<i>Non-Hawaiian Youth</i>		<i>Hawaiian Youth</i>		<i>Mean Difference</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	
Age	15.481	1.248	15.538	1.242	15.454	1.251	.084*
Anxiety Sum of 20 STAI items	19.550	10.309	18.929	10.011	19.813	10.459	-.884*
Depression Mean of 13 CES-D Items	0.673	0.594	0.635	0.593	0.691	0.591	-.056*
Help 1 Do you discuss any of your problems with any members of your family or friends?	2.766	2.085	2.873	2.141	2.691	2.042	.182*
Help 2 Have you had any serious personal, emotional, behavioral, or mental health problems for which you felt you needed special help or counseling during the past 6 months?	3.217	0.883	3.278	0.842	3.185	0.900	.093*
Hope 1 CES-D Item 8 I felt hopeful about the future	1.280	1.065	1.269	1.074	1.284	1.060	-.015
Hope 2 ... how do you think things are going for you right now?	2.443	0.867	2.433	0.848	2.445	0.874	-.012
Hope 3 ... how will your life be ten years from now?	1.863	0.723	1.865	0.705	1.862	0.729	.003

Note:

* indicates statistical significance at $p < .01$.

CES-D = Center for Epidemiologic Studies Depression Scale. STAI = State-Trait Anxiety Inventory, State subscale.

Table 2

Results of the overall and multiple-group quaternary latent change score model with psychiatric symptom, help-seeking, hope, and suicide.

	Total		Non-Hawaiian		Hawaiian	
	Estimate β	<i>p</i> value	Estimate β	<i>p</i> value	Estimate β	<i>p</i> value
Dynamics						
Change in Symptom						
$F_{\text{Symptom}} \rightarrow \text{Symptom}$	0.106	< .0001	0.083	< .0001	0.097	< .0001
$\text{Suicide} \rightarrow \text{Symptom}$	-1.582	< .0001	-1.541	< .0001	-1.568	< .0001
$F_{\text{Hope}} \rightarrow \text{Symptom}$	-0.277	< .0001	-0.258	< .0001	-0.273	< .0001
$F_{\text{Help}} \rightarrow \text{Symptom}$	0.750	< .0001	0.767	< .0001	0.791	< .0001
Change in Help						
$F_{\text{Help}} \rightarrow \text{Help}$	-1.085	< .0001	-1.109	< .0001	-1.098	< .0001
$\text{Suicide} \rightarrow \text{Help}$	0.054	< .0001	0.075	< .0001	0.062	< .0001
$F_{\text{Symptom}} \rightarrow \text{Help}$	0.477	< .0001	0.446	< .0001	0.477	< .0001
$F_{\text{Hope}} \rightarrow \text{Help}$	-0.412	< .0001	-0.403	< .0001	-0.397	< .0001
Change in Hope						
$F_{\text{Hope}} \rightarrow \text{Hope}$	-0.751	< .0001	-0.771	< .0001	-0.792	< .0001
$\text{Suicide} \rightarrow \text{Hope}$	0.422	< .0001	0.455	< .0001	0.392	< .0001
$F_{\text{Help}} \rightarrow \text{Hope}$	-0.335	< .0001	-0.369	< .0001	-0.395	< .0001
$F_{\text{Symptom}} \rightarrow \text{Hope}$	0.564	< .0001	0.515	< .0001	0.536	< .0001
Change in Suicide						
$\text{Suicide} \rightarrow \text{Suicide}$	-1.205	< .0001	-1.104	< .0001	-1.163	< .0001
$F_{\text{Hope}} \rightarrow \text{Suicide}$	-0.458	< .0001	-0.464	< .0001	-0.450	< .0001
$F_{\text{Help}} \rightarrow \text{Suicide}$	-0.105	< .0001	-0.161	< .0001	-0.098	< .0001
$F_{\text{Symptom}} \rightarrow \text{Suicide}$	0.393	< .0001	0.393	< .0001	0.413	< .0001
Means						
L_{Suicide}	0.000==	--	0.000==	--	0.000==	--
L_{Hope}	0.000==	--	0.000==	--	0.000==	--

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	Total		Non-Hawaiian		Hawaiian	
	Estimate	<i>p</i> value	Estimate	<i>p</i> value	Estimate	<i>p</i> value
I _{Symptom}	0.000	--	0.000	--	0.000	--
L _{Help}	0.000	--	0.000	--	0.000	--
S _{Suicide}	−0.044	0.016	−0.088	0.003	−0.027	0.223
S _{Help}	−0.049	0.018	−0.076	0.014	−0.041	0.101
S _{Symptom}	−0.030	< .0001	−0.062	0.000	−0.015	0.134
S _{Hope}	0.074	0.000	0.121	0.000	0.042	0.022

Note: This table includes only essential parameter estimates for the expected latent change scores. Root mean square error of approximation [RMSEA]=.054, *df*=107, *N_{total}*=7,298 for overall, and RMSEA=.052, *df*=157, *N_{Non-Hawaiians}*=2,378 and *N_{Hawaiians}*=4,827 for multigroup.