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ORIGINAL PAPER

The Efficacy of an American Indian Culturally-Based Risk Prevention Program for Upper Elementary School Youth Residing on the Northern Plains Reservations

John J. Usera[1,2]

Abstract Culturally-based risk behavior prevention programs for American Indian elementary school children are sparse. Thus a group of American Indian educators collaborated in the creation of a program that helps children make healthy decisions based on their cultural and traditional value system. In this paper the effectiveness of Lakota Circles of Hope (LCH), an elementary school culturally-based prevention program was studied and evaluated. Three cohorts of fourth and fifth graders participated in a mixed methods quasi-experimental evaluative research design that included focus groups and surveys prior to and following the intervention. Five research questions regarding the program's impact on students' self-esteem and self-efficacy, Lakota identity, communication, conflict resolution and risk behaviors were addressed in this study. Participants were compared to non-participants in three American Indian reservation school sites. Educators completed a survey to record their observations and feedback regarding the implementation of the program within their respective school sites. The study provides preliminary evidence that, when delivered with fidelity, LCH contributes to statistically significant changes in risk behaviors, Lakota identity, respect for others, and adult and parent communication. A two-way multivariate analysis of variance with post hoc analysis of data collected from the LCH participants ($N = 1392$) were used to substantiate a significant increase in respect for others and a decrease in risk behaviors which included alcohol, tobacco, and substance use at the 0.10 alpha level. Significant positive improvements in parent and adult communication and an increased Lakota identity at the 0.01 alpha level were obtained. There were no significant differences

✉ John J. Usera
jusera@deltaeval.com

[1] Research and Evaluation, Catholic Social Services, 529 Kansas City Street, Rapid City, SD 57701, USA

[2] Delta Evaluation Consulting, LLC, 1010 Ball Park Road, Suite 9, Sturgis, SD 57785, USA

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in self-esteem and conflict resolution from pre to post intervention and in comparison with non LCH participating students.

Keywords Prevention program · Elementary school · Lakota · Culturally-based program · American Indian

Introduction

There are many risk behaviors (e.g., smoking, substance use, sexual initiation, bullying, and fighting) for which evidence-based prevention programs are available for middle and high school students (Ringwalt et al., 2008; Rohrbach et al., 2005). However, the number of prevention programs designed for elementary school students (grades K-5) is sparse, and tend to focus on a single risk behavior. Although risk behavior prevalence is low among 2nd-5th graders, epidemiological data indicate that the rates of these behaviors rising sharply in this period within certain ethnic groups and social environments (Austin & Gortmaker, 2001; Fergusson & Horwood 1995a, b; Hanley et al., 2010; Pederson, Koval, & O'Connor, 1997). Prevention programs that are introduced early in schools serving preadolescent youth appear to have an impact on the reduction and delayed initiation of risk behaviors for early adolescent youth (Losel & Beelmann, 2003; Wilson & Lipsey, 2005). A review by Hopfer et al. (2010) of 24 elementary school prevention programs found that they increased knowledge about substance use, improved resistance skills, and decreased perceptions of prevalence rates. Other studies of prevention programs for elementary school children have demonstrated improved academic and social-emotional learning by addressing risk factors for substance use (alcohol, drug, and tobacco) and early aggressive behaviors (Beets et al., 2009; Ialongo et al., 2001; Kellam et al., 2008; Riggs et al., 2006).

Effective prevention programs have components that help youth establish clear and positive self-identity. For American Indian (AI) youth and other youth of color, the development of positive self-identity and its role in healthy psychological functions are closely linked with the development of ethnic identity (Mendelberg, 1986; Parham & Helms, 1985; Phinney et al., 1990; Zou & Trueba, 1998). The theory of identity development, which emerges from studies of how children establish identities across different social contexts, cultural groups, and genders, creates a construct that is critical to the development and social decision making of minority youth (Erikson, 1968; Gilligan, 1982; LaFromboise & Rowe, 1983; Phinney & Navarro, 1997). Some studies have suggested that it is important for ethnic minority youth to be consciously socialized to understand the multiple demands and expectations of both majority and the minority cultures (Spencer & Adams, 1990). This process may offer psychological protection by providing a sense of identity that captures the strengths of their culture and by buffering against racism and other risk factors.

Prevention programs that foster prosocial norms seek to encourage youth to adopt healthy beliefs and clear standards for behavior through a variety of strategies. Prosocial norms address what is and is not necessary in order to be a member of the

"normal" group. Younger children are influenced by older youth in their environment and by the adults who are their models. Children have to be taught to recognize what are healthy and unhealthy behaviors. This includes learning how to avoid unhealthy situations (e.g., sexual abuse, substance use, violence) and where to get necessary help and support from trusted adults. Therefore, providing a set of coping skills and knowledge for children to make appropriate choices and decisions was one of the primary program objectives. Additionally, helping children set high standards for themselves has been shown to be a positive step in their personal development (Hawkins et al., 1992).

Intervention

The Lakota Circles of Hope (LCH) is a chemical substance, alcohol, and tobacco prevention program taught annually to second through fifth graders. It consists of a 10-lesson per year curriculum on making healthy decisions in the context of Lakota traditions and values, principally in a school-based environment. Parents, educators, and community members have identified this program as a first step in helping introduce young people, families, and educators to the prevention of substance use, depression, and antisocial behavior. The LCH curriculum is based on existing prevention programs (e.g., Alcohol Misuse Prevention, Dielman et al., 1989; American Indian History, Culture and Language: Curriculum Framework—Values, Office of Indian Education, 2010; Anishinabek Family Values, The First American Prevention Center, 2002; CLIMATE Schools, Newton et al., 2009; Drug Abuse Resistance Education, D.A.R.E., Rosenbaum & Hanson, 1998; Learning Prevention Using Lakota Values, Catches 2002; Protecting You/Protecting Me, Bell et al., 2005; The Sacred Tree Curriculum, Lane et al., 1984; We Are All Related, G.T. Cunningham Elementary School, 1996) for children that include age appropriate topics, medically accurate information, and cultural influences (Campanelli et al., 1989; Fisher et al., 2007; Gottfredson & Wilson, 2003; Ringwalt & Bliss, 2006; Vogl et al., 2012; Webster-Stratton et al., 2001). The classroom-centered program is designed to reduce early risk behaviors by enhancing appreciation for Lakota values and traditions as a framework for making decisions and choices that contribute to a healthy and safe environment.

The LCH curriculum is based on the four Lakota values of generosity, fortitude (courage), wisdom, and respect.

- *Wacantognaka*, the Lakota word for generosity, means to contribute to the well-being of one's people and all life by sharing and giving freely. This sharing is not just of objects and possessions, but of emotions like sympathy, compassion, and kindness. It also means to be generous with one's personal time.
- *Wacintanka or fortitude* (Woohitika or courage) means facing danger or challenges with courage, strength and confidence. Believing in oneself allows a person to face challenges. Fortitude includes the ability to come to terms with problems, to accept them, and to find a solution that is good for everyone.

- *Woksape or wisdom:* The knowledge and wisdom of old people is very important for the well-being of the Lakota people. This is understood to be something sought and gained over the course of one's entire life, and has to do with understanding the meaning within natural processes and patterns; that is, knowing the design and purpose of life.
- *Wowacintanka or respect* helps people to live together in peace and harmony. This attitude means a reverence for all other living things in the world. This value is sometimes expressed as *wotakuya*, or kinship. This is one of the important values that support the *tiyospaye*, a band or extended family group. It includes the ideas of living in harmony, belonging, relations as the true wealth and the importance of trusting in others (Table 1).

An important attribute of LCH is that the program is introduced at an early age. Many studies document how substance use, antisocial behaviors, depression prevalence, and intentions and practices to engage in risky behaviors increase at a moderate rate between the third and fourth grades, with a larger increase between the fifth and sixth grades (Andrews et al., 2003; Hopfer et al., 2010; Wilson & Lipsey, 2005). LCH introduces specific topics in a developmentally appropriate manner throughout its 4-year time period (second to fifth grades) to mitigate an increase in risk behavior rates.

Originally, LCH lessons were delivered in the classroom only by trained instructors who were members of one of the Lakota tribes and who were knowledgeable in the Lakota language, practices, and traditions. With training and a

Table 1 Lakota Circles of Hope Objectives

Students will:	Lakota value
1. Learn about the Lakota value of respect and how it relates to their personal self-worth	Respect
2. Be able to identify and express personal feelings to others, to understand the importance of active listening, and to assess facts and untruths	Generosity
3. Discuss criteria for safe and healthy relationships and how to set clear boundaries	Fortitude
4. Explore how to refuse or say no to unhealthy relationships, substance use, sexual advances, peer pressure, and provocation	Fortitude
5. Learn about the various risk behaviors (substance use, early onset of sexual behaviors, and self-destructive behaviors) and their long-term physical and emotional consequences	Wisdom
6. Practice the Lakota value of wisdom by applying a step-by-step process for making good decisions, problem solving, and setting personal goals	Wisdom
7. Practice the Lakota values of bravery and respect by learning assertiveness skills, conflict resolution skills, and anger management	Respect
8. Develop a safety plan that includes contacts and places, and will have an understanding of internal and external threats to their personal safety, and a mechanism for dealing with them within the school, community, and home	Wisdom
9. Reflect and summarize knowledge, skills, attitudes, and beliefs gained from LCH in the context of the Lakota traditional values and culture	All

Lakota mentor, non-American Indian instructors have since been able to deliver the lessons. The students receive a 45-min lesson with opportunities to finish their activities in school and at home.

The development and creation of the LCH curriculum involved a team of Lakota educators who reviewed existing prevention curricula for age appropriateness of contextual knowledge (Hanbury, Thompson, & Mannion, 2011), cultural relevancy and competency (Kegler et al., 2002; McKennitt & Currie, 2012), and pedagogical approaches (Nelson, Martella, & Martella, 2002). The 2-year curriculum development process included identification of instructional patterns, strategies, and performance outcomes for the teaching and delivery of lessons and activities (Wiles & Bondi, 2002). Using a deliberative approach to curriculum planning, the team reviewed the design of materials and curricula that centered on AI culture, and used age appropriate risk prevention and youth development strategies (Marsh & Willis, 1995; Walker, 1971). These strategies were designed to provide students with knowledge about various risks and to learn coping skills to address any negative social pressures. Each of the 40 LCH lessons (10 lessons per grade level) has a pedagogical framework that includes Lakota stories, cultural crafts and activities, knowledge content, discussion, and application to daily life (Catches, 2002; D.A.R.E., 2010; Four Winds Development Project, 1984; LaFromboise, 1995; The First American Prevention Center, 2002).

Additionally, families and communities are embedded as a major component of the curriculum. Kegler et al. (2002) suggests that families and communities have a great effect on child-rearing practices, attitudes, values, and behaviors, which may, in turn, influence whether children will abuse drugs, become sexually active, be involved in violence, or consider suicide as they move into adolescence. The children are encouraged to share what they have learned about their Lakota heritage, risk behaviors, and healthy decisions with their parents, families, and other adults. The verbal and nonverbal modeling of the anti-substance use messages youth receive from family members at home is a major component of any prevention socialization process. Kegler et al. has showed that across all ethnic groups and both genders there is evidence that parents who talk to their child about the negative health effects of substance use increase abstinence and delay risk behaviors. Children's social environments include families, community, peers, and elders, and children rely on these members for the knowledge, experience, and skills required for development into adolescence.

The social-cognitive model (i.e., using knowledge to respond to a social environment and social pressures) assumes that children who engage in disruptive or antisocial behaviors may have distorted views of what constitutes a good decision or choice, and have deficiencies in their social problem-solving skills (Bandura, 1993). Bandura's (1986) social cognitive theory challenges the theories of human functioning that focus on the role of environmental factors in the development of human behavior and learning. Since the Lakota children involved in LCH reside on reservations with high poverty, high substance use, and minimal safe places, environment factors were considered to be important consideration in the development of the curriculum. We were particularly interested in identifying what protective factors may be available to reservation children and how can they access them while living in a dysfunctional environment.

Intent of the Study

The purpose of this study is to determine if LCH had any positive impact on fourth and fifth grade participants regarding healthy decisions on substance use, conflict resolution, communication, self-identity, and cultural competence. A mixed methods approach was used to answer the research questions, which are aligned with the program objectives. We sought to understand whether children completing the LCH would:

1. demonstrate an improved understanding of the Lakota values, traditions, and practices;
2. demonstrate an understanding of the health impediments caused by the use of alcohol, tobacco, and chemical substances;
3. be able to resolve conflicts using learned skills and techniques;
4. demonstrate improved self-esteem and self-efficacy; and
5. demonstrate improved communication skills with their parents, elders, and other trusted adults.

In addition, we sought to determine if the cultural framework of the program was relevant and meaningful to a Lakota child's life. The culturally responsive pedagogy is intended to cultivate academic achievement, social consciousness, cultural affirmation, value-centric behavior, individual self-worth, and social competence (Gay, 2000), and in this study, we sought to determine if the culturally responsive pedagogy was realized for the students targeted.

Methodology

The framework for both the qualitative and quantitative data protocol included measures that tested the success of the LCH approach to improve Lakota youth's social, emotional, and cognitive development as a means to reduce risky behaviors such as substance use and antisocial behaviors. The research process for LCH included both formative (process) and summative (outcome) methods.

We used empowerment and collaborative evaluation models in the development and the implementation of the research plan. The empowerment evaluation model placed an explicit emphasis on building the evaluation capacity of the staff and organization so that the evaluation and research processes was integrated into the management of the LCH curriculum (Cox et al., 2009). The collaborative evaluation model provided a framework for the staff, researchers, and stakeholders to work as a team in the formation and execution of the evaluation and research plans. The emphasis of this approach was to engage stakeholders in the research process so they could participate in identifying the study's performance measures, questionnaire items, and outcomes, and ultimately use the findings for decision-making and program improvement purposes (Preskill & Boyle, 2008). Performance measures were used to assess the implementation of the proposed activities and associated procedures for the successful implementation of the project. The impact outcome

assessed any significant changes in participants' knowledge, skills, and practice that contributed to building healthy youth.

In order to participate in the program and research, we asked parents to complete active consent and intake forms. The forms were sent from the school to each household and returned to the school after one week. All parents consented for their child to participate in the program and in the evaluation process. An institutional review board (Institute for Educational Leadership & Evaluation) approved the research design and associated forms (consent form and questionnaires) required for the data collection. The school boards of the participating elementary schools approved the implementation of LCH within their district. All the participants completed pre and post questionnaires (described below) to measure their knowledge, attitude, and understanding of cultural expectations related to the avoidance of risky behaviors. For all the school sites there were no children excluded from participating in the program.

Student sampling was purposive and represented the target populations of four American Indian reservations in South Dakota. This type of sampling can be a challenge (e.g., it can limit generalization and inferences to the general population). However, in this case, where the program was new and experimental, participating schools represented typical reservation schools as to ethnicity, age, socioeconomic status, and location (rural versus town; Creswell & Clark, 2007). The 10 participating schools were selected on the basis of each school's interest in implementing the program. Over the 3-year study period, the average number of students in the intervention cohort was 398 fourth and fifth graders.

Three school sites were self-selected to provide students for a comparison group. The comparison schools had ethnic, grade, gender, and age distributions that were similar to the intervention group. Students in the comparison schools were administered the same pre and post questionnaires as the intervention group. The pre questionnaire was administered early in the school year, and the post questionnaire was completed at the end of the school year. The comparison group included 139 fourth and fifth graders.

The study's qualitative component included at least four focus group meetings per year with fourth and fifth graders participating in LCH (8-10 participants per group). We asked participants a series of questions on their understanding and application of Lakota values in making good decisions during and after school. Additionally, we asked about their satisfaction with LCH and any suggestions for improving the program.

Pre and post questionnaires were designed and implemented to measure the achievement of the specific objectives of LCH consistent with current research and evaluation practices involving culturally based prevention programming (Chouinard & Cousins, 2009). Developed as part of the collaborative process among school staff, program developers, and researchers, the questionnaire items and scales were based on studies that measured behavioral risks, substance use, self-esteem, and cultural and moral competence (Mokdad, 2009; Reininger et al., 2003; Usera & Anagnopoulos, 2007) (Table 2).

Questionnaires were coded so as to perform matched and independent analyses of the pre and post results. Students were assigned seven digit numerical codes by the

Table 2 Questionnaire subscales (factors)

Factors	Question	Values	Score	Reliability coefficient
Risk behaviors	In the past 30 days, I used tobacco	1–6	6–30	0.91
	In the past 30 days, I drank alcohol			
	In the past 30 days, I used marijuana			
	In the past 30 days, I used bad drugs			
	In the past 30 days, I have had sex			
	In the past 30 days, I have huffed or sniffed			
Communication	In the past 30 days, I talked to my parents about my problems	1–5	3–15	0.87
	In the past 30 days, I talked to another adult about my problems			
	In the past 30 days, I listened to my parents and elders			
Respect	In the past 30 days, I respected other people's property	1–4	4–12	0.88
	In the past 30 days, I was kind to another person			
	I am polite to other people			
	I practice wacantognaka (generosity to others)			
Lakota identity	I consider myself to be Lakota, Dakota, or Nakota	1–4	4–12	0.85
	I am proud to be Lakota, Dakota, or Nakota			
	I practice my Lakota, Dakota, or Nakota traditions			
	I am learning my Lakota language.			
Conflict resolution	In the past 30 days, I got into a fight	1–6	4–23	0.89
	In the past 30 days, some teased me or picked on me	1–6		
		1–6		
	In the past 30 days, I knew when to say no	1–5		
	I am able to control my anger			
Self-esteem	I think I am a good person	1–4	4–20	0.82
	I believe my body is sacred			
	I am proud to be Lakota			
	In the 30 days, I have lied to someone			

instructors for completing the pre and post questionnaires. Codes were designed to maintain anonymity of the individual respondent and were used to match those students who completed or did not complete the pre and post questionnaires within the program year. In the pooled intervention group, 24.4% of the fourth graders and 30.7% of the fifth graders did not complete a post questionnaire. The difference was due to scheduling conflicts, transfer to another school, and unavailability of the participants at the end of the school year. Only those students who completed the pre questionnaire were included in the post questionnaire analytical sample. All questionnaires requested demographic information regarding gender, grade level, age, and ethnicity to assure equivalence of samples. The pre questionnaires had 31

items while the post questionnaire had an additional 10 items focusing on the pedagogy and student satisfaction with the LCH program. The questions asked about the respondent's attitude, skills, and knowledge regarding social behaviors and Lakota traditions and values. The validity of the items was reviewed by educators and professionals involved in prevention work with children. The construct validation procedures were important to assure the validity of the assessment tools used in the program evaluation. Comparing responses before and after the implementation of the Lakota Circles of Hope in the various school settings assured that assessment items measured a specific variable or construct (Linn & Miller, 2005).

A principal components factor analysis was performed in order to group the 31 items asked in the pre and post questionnaires into variables (or factors) that could be used to measure the impact of the LCH on the participants. Seven items were demographic questions while the remaining 24 questions focused on specific behaviors and psychometrics. Factor loadings using an equimax rotation confirmed the selection of questionnaire items that contributed to the formation of a score for each of the identified six factors. The identified factors include:

1. *Risk behaviors* These six items asked the respondent the number of times they have engaged in a specific risk behavior in the past 30 days. Summation of the number of incidents generated a score for this factor from 6 to 30. The risk behaviors included chemical substance use and sexual activity. A low score indicated low engagement in risk behaviors.
2. *Communication* This factor included three questions that asked the respondents how often they have communicated with their parents or other adults. Included in this factor was an item asking if they listen to their parents and elders. The response had three levels which were rated from 3 for *always* or *yes*, 2 for *sometimes*, and 1 for *no* or *never* response. The summation of the level of responses provides a score ranging from 3 to 15. A high score indicated a high level of communication with adults, parents, and elders.
3. *Respect* This factor was composed of four items that focused on what constitutes respectful behavior to other people. This factor included respect for other people's property and lying to other people. There were three levels of responses rated from 3 for *always* or *yes*, 2 for *sometimes* to 1 for *no* or *never*. The summation of the level of responses provides a score from 4 to 12. A high score reflected a high level of respect for others and their property.
4. *Lakota identity* There were four items linked to Lakota attributes for which response options were *yes*, *no*, or *sometimes*. The total score for this factor ranged from 4 to 12. A high score indicated a student's positive Lakota identity.
5. *Conflict resolution* There were four items on the questionnaire that were linked to conflict and conflict resolution. This included the number of fights in the past 30 days and being able to say no to any antisocial behavior. The summations of the responses formed a score that ranged from 4 to 21. A high score reflected a students' ability to not get in fights and to resolve conflicts.

6. *Self-esteem* There were four items related to self-esteem or efficacy. The items asked students about their personal assessment of themselves. Scores ranged from 4 (*low*) to 20 (*high*).

Surveys were administered to educators and community members at the end of the program to determine their level of satisfaction and effectiveness of the prevention programming. The *Educators and Community Assessment* was composed of 15 statements regarding the Lakota Circles of Hope program goals and implementation. Respondents were asked to respond to the statements using a 5-point Likert scale from *strongly agree* to *strongly disagree*.

The data collected were analyzed using Minitab 16.0 and NCSS-9. Care was taken to measure effect size and statistical power according to the statistical tools used. When measuring significant changes, t tests were used for interval/ratio data. The z test was used to measure significance for proportional data in either a 2×3 or a 2×2 table (McNemar, 1947). Measure of association between categorical variables was performed using the Chi square goodness of fit test. All statistical tools were used to measure significant or non-significant differences, changes or associations at the 0.025 alpha levels.

Fidelity to program implementation was monitored by the researcher and director using self-assessment fidelity monitoring logs and observation logs of lesson implementation (Zvoch, 2009). Changes to the curriculum and delivery modalities were reported to the director and the researcher. Any significant modifications or adaptations were measured for association between initial lesson designs versus any significant change in the activity. The association between lesson implementation and outcome measure was analyzed using the Chi square goodness of fit analysis procedures. Other information documenting program fidelity or lesson adaptations were obtained through interviews with the staff, self-assessment monitoring, and lesson implementation observations.

Results

There were a total of 1531 students who completed the pre questionnaire and 1145 students who completed the post questionnaire. In the intervention group there were 740 fourth and 652 fifth graders who responded to the pre questionnaire and 559 fourth and 452 fifth graders who responded to the post questionnaire. The intervention group had a baseline mean age of 10.2 years with 52.6% being female and 87.1% identified as American Indian. Students in the comparison group did not participate in the LCH program during the year. In the comparison group, there were 87 fourth and 52 fifth graders who responded to the pre questionnaire and 86 fourth and 48 fifth graders who completed the post questionnaire. A total of 139 students completed the pre questionnaire and a total of 134 students completed the post questionnaire. The comparison group baseline mean age of the participants was 10.2 years with 44.9% female and 85.7% American Indian.

A two-way multivariate analysis of variance (MANOVA) was conducted to test the hypotheses that there would be a difference between the factors' scores based on

the time (pre and post) in the LCH program and group assignment (intervention or comparison). Table 3 shows a summary of the multivariate and univariate results that includes the Fisher ratio (F), probability (p), and standard error (η^2) for each factor. The standard error (η^2) indicated the proportion or percent of multivariate variance of the dependent variables associated with the group factors. The Wilk's Λ measured the proportion of variance in the combination of dependent variables that was unaccounted for by the independent variable (time or group assignment). This contributed to supporting the multivariate homogeneity of the covariance between the groups.

Effect sizes were computed for each data set to support the null hypothesis significance testing results. Since effect size estimates are resistant to sample size influences, the Cohen d values provided a truer measure of the magnitude of effect between variables. Cohen (1988) rules for interpreting effect sizes were a "small" effect size = 0.20, a "medium" effect size = 0.50, a "large" effect size = 0.80 and "very large" effect size $\geq$1.30. The subscales of respect ($d = 0.123$), communication ($d = 0.205$) and conflict resolution ($d = 0.069$) had a small effect size, while the remaining subscales had a medium effect size.

A statistically significant MANOVA effect was found for group assignment, Wilks' $\Lambda = 0.992$, $F(6, 2670) = 3.61$, $p < 0.001$, $\eta^2 = 0.25$. There was no significant MANOVA effect based on time (pre versus post), Wilks' $\Lambda = 0.997$, $F(6, 2670) = 1.3$, *ns*, $\eta^2 = 0.18$. The interaction between group assignment and time was not significant in this multivariate model, Wilks's $\Lambda = 0.999$, $F(6, 2670) = 0.61$, *ns*, $\eta^2 = 0.13$ (Kachigan, 1986; Myers et al., 2006).

In the univariate analysis of variance for risk behaviors there was no significant effect based on group assignment, $F(1,2675) = 0.98$, *ns*, $\eta^2 = 2.02$. There was no significant difference for the risk behavior scores between the pre and post data collection period, $F(1,2675) = 0.07$, *ns*, $\eta^2 = 0.53$ and its interaction with group assignment, $F(1, 2675) = 0.13$, *ns*, $\eta^2 = 0.00$. In the post hoc test analyses between the intervention and comparison groups at pre and post data collection points there were no statistically significant differences found for risk behaviors mean scores at the alpha 0.05 level (Table 4).

For the communication factor the univariate analysis of variance found a significant effect based on group assignment, $F(1,2675) = 5.75$, $p < 0.020$, $\eta^2 = 5.70$. There was no significant difference for the communication scores between the pre and post data collection period, $F(1,2675) = 2.39$, *ns*, $\eta^2 = 3.67$ and its interaction with group assignment, $F(1, 2675) = 0.00$, *ns*, $\eta^2 = 0.04$. In the post hoc test analyses a significant difference for the intervention group from the pre to the post data collection points were found at the alpha 0.01 level ($t[2431] = 4.358$, $p < 0.001$, Cohen's $d = 0.177$) for the communication means.

In the univariate analysis of variance for respect there was a significant effect based on group assignment, $F(1, 2675) = 7.56$, $p < 0.010$, $\eta^2 = 6.11$. There was no significant difference for the respect factor scores between the pre and post data collection period, $F(1, 2675) = 0.62$, *ns*, $\eta^2 = 1.75$ and its interaction with group assignment, $F(1, 2675) = 0.19$, *ns*, $\eta^2 = 0.97$. In the post hoc test analyses there was no significant difference between the comparison and intervention groups at the post or pre to post data collection points.

Table 3 Multivariate and univariate analysis of LCH factors

Source	Multivariate			Univariate																
				Risk behaviors			Communication			Respect			Lakota identity			Conflict resolution			Self-esteem		
	F^a	p	η^2	F^a	p	η^2	F^a	p	η^2	F^a	p	η^2	F^a	p	η^2	F^a	p	η^2	F^a	p	η^2
Group assignment (G)	3.61	**0.00**	0.25	0.98	0.32	2.02	5.75	**0.02**	5.70	7.56	**0.01**	6.11	2.48	0.12	1.70	0.03	0.87	0.31	7.93	**0.00**	5.64
Time (T) (pre vs. post)	1.31	0.25	0.18	0.07	0.80	0.53	2.39	0.12	3.67	0.62	0.42	1.75	0.17	0.68	0.44	1.02	0.31	1.97	1.04	0.31	2.04
G × T	0.61	0.72	0.13	0.13	0.72	0.73	0.00	0.99	0.04	0.19	0.66	0.97	1.05	0.31	1.11	1.25	0.26	2.18	0.06	0.80	0.50

Bolded values are significant

[a] Fisher ratio in this table is $F(1, 2675)$

Table 4 Least significant difference (LSD) *t* test of mean scores post hoc analyses by group & time

Factor		Pre		Post		Pre T × C	Post T × C	Pre/post T	Pre/post C
		Mean score	*SD*	Mean score	*SD*	*t*	*t*	*t*	*t*
Risk behaviors	T	6.37	1.15	6.28	1.33	−0.233	1.512	−1.803*	0.494
	C	6.36	1.74	6.35	1.26				
Communication	T	9.03	2.19	8.83	2.34	−1.609	−1.556	−4.358***	−1.161
	C	8.86	2.35	8.35	2.26				
Respect	T	12.18	2.00	12.12	2.02	−1.897*	−1.514	0.367	0.616
	C	11.70	1.93	11.67	1.88				
Lakota identity	T	5.50	1.08	5.56	1.25	-2.63**	−4.0765***	1.132	−0.356
	C	5.18	1.12	6.26	0.68				
Conflict resolution	T	9.62	1.78	9.57	1.80	1.579	0.824	−0.105	−0.667
	C	10.01	1.53	9.57	1.76				
Self-esteem	T	10.09	1.84	10.02	1.99	−0.780	−0.256	0.517	0.575
	C	10.14	2.14	10.47	1.82				

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

For the Lakota identity factor the univariate analysis of variance found no significant effect based on group assignment, $F(1,2675) = 2.48$, *ns*, $\eta^2 = 1.70$. There was no significant difference for the Lakota identity factor scores between the pre and post data collection period, $F(1,2675) = 0.17$, *ns*, $\eta^2 = 0.44$ and its interaction with group assignment, $F(1, 2675) = 1.05$, *ns*, $\eta^2 = 1.25$. A significant difference between the comparison and intervention groups at the post data collection point were found at the alpha 0.01 level ($t[1076] = 4.0765$, $p < 0.001$, Cohen's $d = 0.249$) for the Lakota identity means. Only students that identity themselves as Lakota were included in these tests.

In the univariate analysis of variance for conflict resolution there was no significant effect based on group assignment, $F(1,2675) = 0.03$, *ns*, $\eta^2 = 0.31$. There was no significant difference for the conflict resolution factor scores between the pre and post data collection period, $F(1,2675) = 1.02$, *ns*, $\eta^2 = 1.97$ and its interaction with group assignment, $F(1, 2675) = 1.25$, *ns*, $\eta^2 = 2.18$. In the post hoc test analyses between the intervention and comparison groups at pre and post data collection points there were no statistically significant difference found for conflict resolution mean scores.

For the self-esteem factor the univariate analysis of variance found a significant effect based on group assignment, $F(1,2675) = 7.93$, $p < 0.001$, $\eta^2 = 5.64$. There was no significant difference for the self-esteem scores between the pre and post data collection period, $F(1,2675) = 1.04$, *ns*, $\eta^2 = 2.04$ and its interaction with group assignment, $F(1, 2675) = 0.06$, *ns*, $\eta^2 = 0.50$ In the post hoc test analyses between the intervention and comparison groups at pre and post data collection

points there were no statistically significant difference found for self-esteem mean scores.

At the end of each year, educators and community members who had been involved directly or indirectly with LCH were asked to complete the Lakota Circles of Hope Educator and Community Assessment. The number respondents averaged about 40 individuals answering a series of 15 questions. Eighty percent of respondents were female and 74.4% were classroom teachers.

Almost 90% (87.0%) of the respondents believed that the lessons contained a high level of knowledge about the Lakota values and traditions. Eighty-eight percent believed that the lessons were presented with good information about substance use and its effect on a person's health. Over 90% of the respondents believed the program was very good and more time could be dedicated to teaching it.

In all the schools, the students were active participants in LCH. This is consistent with the fact that over 95% of the respondents reported children were highly engaged in the activities. Although there was some fluctuation each year in the level of engagement, all the teachers believed that the students gained from the experience and gained knowledge about making healthy decisions from one or more of the lessons.

Discussion

The goal of this study was to determine if the Lakota Circles of Hope program had an impact on participating students in regard to their identity, communication with adults and parents, dealing with conflicts, respect for other people and their property, and avoidance of risk behaviors. In the first year of this study there were no significant changes noted between the pre and post data collection points except for communication for the fourth and fifth grade participants. After analysis of the data and interviewing of the staff, we determined that there was a lack of fidelity in the delivery of the lessons. Three different instructors were responsible for teaching the lessons, but there was no control for the adaptations made to the lessons and delivery dosage.

Therefore, fidelity monitoring logs for each lesson were designed in collaboration with the researcher and staff. After completing each lesson, the instructor was required to complete the log and to record any adaptations of a lesson. Additionally, a 10-item observation form was designed to document an independent observation of at least 10% of the lessons delivered during the year by each instructor. The observation results were shared with the instructor to assist in the improvement of lesson implementation and fidelity to the program and lesson design.

As a result of implementation of a fidelity and observation protocol, the second and third years' data showed statistically significant changes from pre to post questionnaire administration in many of the factors. Program adherence strategies had been examined and shown to make a difference in program delivery, effectiveness, and achievement of expected outcomes (Kalafat, Illback, & Sanders, 2007; McGrew et al., 1994; McHugo et al., 1999). When the data were

disaggregated by grade level, similar significant changes were noted. Although the percentage of change from pre to post was not high, it was positive but not statistically significant as calculated by the multivariate analysis of variance. However, the ANOVA did show a significant difference between group assignment in communication, respect and self-esteem factors at the $p < 0.025$ level.

In answering the research question "Do the children completing LCH show an improved understanding of the Lakota values, traditions, and practices?" the findings related to the Lakota Identity construct supported a positive significant change for the participants. The participants reported their understanding of Lakota values and integrated them into the activities and stories shared during the lessons. In Year 2 and Year 3, students reported a positive increase in the percentage practicing their Lakota traditions at a rate of 54.1% and 48.5%, respectively. The students shared similar active learning and application experiences gained from LCH. In every lesson the Lakota values of respect, generosity, and fortitude were noted as the values they learned and tried to practice. The students saw the importance of respect for each other, other people, and their property. There was a significant difference between the intervention and comparison group after completing LCH for the respect factor. Many students noted the importance of caring for other people and helping those in need. Courage was important to many of the participants because it took a special fortitude to say no to doing something that was not right or could hurt them. The boys and girls in the group shared similar responses regarding the Lakota values.

The Risk Behaviors construct provided feedback on how participants answered the research question "Do the children completing LCH show an understanding of the health impediments caused by the use of alcohol, tobacco, and chemical substances?" For example, in the area of tobacco use the results show no significant change in the first year, but changes were noted in the second and third years of program implementation although they were not statistically significant. Overall, the six areas identified in this factor showed an increase in abstinence from the use of alcohol, marijuana, huffing, and sex.

The Conflict Resolution construct answered the research question, "After completing LCH, will the participating children be able to resolve conflicts using learned skills and techniques?" There were a number of positive social behaviors that were measured during the implementation of LCH related to conflict resolution. Being able to say "no" relates to being able to say "no" to gang membership (a decline of 11.7%) and getting into fights (a decline of 11.2%). The LCH lessons provided the background knowledge necessary for children who were having conflicts to meet and resolve them. Although no significant difference was noted, the overall results showed that many students were able to obtain the skills necessary to prevent escalation into physical fights and bullying (Nelson, Martella, & Marchand-Martella, 2002).

In answering the research question, "After completing LCH, will the participating children have improved self-esteem and self-efficacy qualities?" the Self-Esteem factor was found to be significantly different between the intervention and comparison groups at completion of the intervention. The identity (self-esteem) construct is "associated with the theory of identity development emerging from

studies of how children establish their identities across different social contexts, cultural groups, and genders" (Catalano et al., 2004, 99). Having a clear and positive identity is a critical component for any prevention program and thus was embedded as part the LCH program objectives. The results show that participants felt more positive about themselves, were proud to be Lakota, and believed their bodies to be sacred. The cultural components to LCH enhanced the personal value of their lives and the importance of making healthy decisions that preserved the integrity of a person. For youth of color, the development of positive identity and its role in healthy psychological functioning is closely linked with the development of ethnic identity (Phinney, 1991).

The Communication construct was used to answer the research question "After completing LCH, will the participating children have improved communication skills with their parents, elders, and other trusted adults?" The students were asked if they communicated with their parents and other adults by sharing their problems, asking questions, or just listening to their advice and stories. In all three years, there was a statistically significant improvement in the communication level between child and adult or parent between the comparison and intervention groups after completing LCH. The implications for these findings are consistent with studies that found a link between active communication and behavioral outcomes (Kegler et al., 2002) which included abstinence from smoking, alcohol, and other chemical substances. Additionally, students were able to establish a trust bond so that they could share their personal experiences, problems, and resolutions especially from peers.

Limitations to the study effects can be attributed to the self-selection of intervention and comparison schools and the lag time of program implementation. The design of this study was based on the schools choosing to participate in the program or serving as a comparison school site. Although the demographic configuration and location of schools were similar, an external threat to validity arises when the student settings are different. When the program was provided at each of the intervention school sites, some schools chose to deliver the program in the fall semester and some selected to deliver the program in the spring semester. This lag time could have served as an internal threat to validity based on the maturation of participants between fall and spring semesters for the same grade levels (Creswell, 2003).

Conclusion

The Lakota Circles of Hope is in its sixth year of implementation. This 3-year study documents the effectiveness of the program in helping preadolescent youth gain skills, knowledge, and competencies to address the challenges facing them in their development. The program involved the creation and design of the curriculum using a team of Lakota educators and curriculum expert who had taught on both the Pine Ridge and Rosebud Indian Reservations. The team was able to design a curriculum that was based on previous Lakota values for middle and high school students, current research, and best prevention pedagogy. Each of the lessons were piloted on

two reservations to determine what modifications and adjustments needed to be made to make it age and grade appropriate and deliverable in a specific time frame. The addition of the fidelity monitoring steps in the second and third year provided an element critical for implementation of a program that does make a difference. The combination of evidence-based curriculum design and assessment of the lessons resulted in a curriculum that was to be fully implemented in the past 4 years of the project. The results of the study show that a program like LCH can provide tools for reversing the distorted view and negative behaviors which will have a meaningful impact on later negative outcomes regardless of challenges in the child's environment, e.g., poverty and reservation life.

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Compliance With Ethical Standards

Conflict of Interest The authors of this manuscript certify that they have NO affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript. The authors of this manuscript served as external evaluators and researchers of Lakota Circles of Hope and were compensated for the implementation of a program evaluation process based on the American Evaluation Association's Guiding Principles for Evaluators. Annual reports were produced to document the findings and conclusions obtained from the data collection and analytical process. The authors implemented the Journal of Primary Prevention Publication Guidelines consistent with the Committee on Publication Ethics (COPE) principles.

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