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Effectiveness of Native STAND: A Five-Year Study of a Culturally Relevant Sexual Health Intervention

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Abstract: Culturally relevant interventions have the potential to improve adolescent health and protective factors associated with sexual risk taking. We evaluated the impact of the Native STAND curriculum with American Indian and Alaska Native (AI/AN or Native) high school students living across the U.S. using a pre-post evaluation design. Native STAND is a comprehensive sexual health curriculum for Native high school students that focuses on sexually transmitted infections, HIV/AIDS, and teen pregnancy prevention, while also covering drug and alcohol use, suicide, and dating violence. The curriculum was implemented in 48 AI/AN communities from 2014 to 2019. A significantly higher percentage of youth reported at post-test having a serious conversation about sex with their friends (post 36% vs. pre 28%, $p < 0.001$), thinking about lessons learned (post 24% vs. pre 7%, $p < 0.0001$), and sharing lessons learned during the conversation (post 21% vs. pre 4%, $p < 0.001$). A lower percentage of AI/AN youth reported being bullied in the last year (post 31% vs. pre 37%, $p < 0.001$). Family social support was moderated by dose, with subscale scores of 3.75 at post-with <27 sessions vs. 3.96 at post-with all 27 sessions ($p = 0.02$). The results demonstrate the effectiveness of Native STAND when delivered in a variety of settings. Efforts are now underway to update Native STAND for medical accuracy, improve alignment with typical class periods, and promote its use and an effective EBI for AI/AN youth.

Keywords: American Indian Alaska Native; cultural interventions; adolescent health

1. Introduction

American Indian and Alaska Native (AI/AN or Native) youth are diverse and resilient. Approximately 5.2 million AI/AN people are living in the United States today, over 2.1 million of whom are 24 years or younger [1]. Despite their immense cultural resilience, AI/AN youth are disproportionally impacted by common adolescent health outcomes resulting from intergenerational trauma, forced relocation and assimilation, the boarding school system, and other devastating U.S. policies [2]. Many Native youth live in communities that are

disproportionately affected by high rates of poverty, unemployment, health disparities, substance abuse, low education attainment, family violence, and crime [3]. As a result, AI/AN females between the ages of 15 and 19 have the highest rates of Chlamydia in the U.S. (3638.8 per 100,000) [4]. AI/AN youth are more likely to initiate sex before the age of 13 except for Black/African American youth [4] and early sexual debut increases the likelihood of STIs. AI females are more likely to begin childbearing as youth and have the third-highest birth rate among all racial/ethnic groups and the most frequent repeat teen pregnancies [5].

Research suggests that poverty, substance use, physical and or sexual abuse, and barriers to accessing health resources are associated with risky sexual behaviors in AI/AN youth [5]. A major protective factor against early sexual debut among AI/AN youth is family connections and involvement [5]. Greater perceptions of parental monitoring and parent–child communication about sexual health topics have been shown to delay early sexual initiation of among AI/AN youth [6]. Other protective factors for AI/AN youth include personal wellness, positive self-image, self-efficacy, familial and non-familial connectedness, positive opportunities, positive social norms, and cultural connectedness [7]. Such factors have been shown to positively influence adolescent alcohol, tobacco, and substance misuse; delinquent and violent behavior; depression and suicide; resilience; and academic success [8].

Adolescence is a critical time for identity and protective skill development for Native youth [9]. While all people carry multiple identities (gender and sexual orientation, cultural, religious, and national, to name a few), the development of ethnic and racial identities are particularly meaningful for minority youth [10]. Historically, AI/AN communities supported and celebrated expansive definitions of gender and sexual orientation [10,11]. Today, many AI/AN youth who identify as lesbian, gay, bisexual, or trans (2SLGBT) use contemporary, indigenous-specific terms, including Two Spirit and indigiqueer, to describe their identities. Although discrimination and stigma can negatively affect the health of 2SLGBT youth, leading to increased risk of bullying, depression, and suicide, 2SLGBT adolescents who are supported by their families and communities thrive. With family and community support, 2SLGBT youth are more likely to have positive adult health outcomes such as self-esteem, social support, and better general health [11]; are less likely to experience depression, substance abuse, and suicidal ideation and attempts [12]; have improved self-esteem and coping ability [12]; and transgender youth who have socially transitioned (live as their chosen sex) also have levels of depression and anxiety similar to their cisgender peers [13]. Building cultural pride and positive identity must be central to improve health outcomes for AI/AN youth.

To fill this need, culturally relevant interventions are increasingly being designed to improve adolescent health and wellbeing, enhance skills and positive connections with caring adults and peers, and reduce sexual health risk taking. A rigorous evaluation of these interventions shows promise and effectiveness. Respecting the Circle of Life: Mind, Body and Spirit (RCL) is a culturally adapted comprehensive sexual and reproductive health program for AI youth ages 11–19. RCL includes eight lessons delivered by parents and trusted adults during summer basketball camps [14]. A longitudinal study of RCL found that it improves HIV knowledge, condom use self-efficacy, condom use intention, partner negotiation, belief condoms prevent pregnancy and infection, and talking with family about HIV/AIDS [14–16]. Multimedia Circle of Life (mCOL) is a seven lesson online sexual risk-reduction program for AI/AN youth ages 10–12 [17]. Longitudinal studies of mCOL at post-intervention and 9-months follow-up demonstrated self-efficacy and volition—both may lead to less risky behavior in later years. Native It's Your Game is an Internet-based, 13-lesson sexual health life-skills curriculum for AI/AN middle school youth [18]. A randomized control trial of Native IYG found that it increased reasons not to have sex, STI and condom knowledge, and condom use self-efficacy [18]. Native VOICES is a 23-min video designed to encourage condom use and HIV/STI testing among heterosexual and LGBTQ AI teens and young adults 15–24 years old [19]. The intervention produced statistically significant improvements in STD knowledge, attitudes toward condoms and

dental dams, and self-efficacy toward condoms and dental dams, which were retained at the 6-month follow-up [19]. Native VOICES was the first evidence-based intervention recognized by the CDC for preventing HIV and other STIs among AI/AN youth [20].

The present study tests the effectiveness of Native STAND, a 27-session curriculum based on the STAND intervention originally designed and evaluated among rural youth in the southern U.S. [21]. Previous evaluations of Native STAND demonstrated significant improvements in the knowledge of STI/HIV prevention, reproductive health, healthy relationships [22], increases in confidence, self-esteem, and youth being more involved in the culture and community [23]. Evaluations of Native STAND in residential school and community settings demonstrate that it effectively reduces risk factors and strengthens resilience [24]. Additional research was needed, however, with a sufficient sample size, to confirm those findings, and explore the long-term impacts of an EBI implemented on a national scale.

This paper uses longitudinal data to explore health outcomes for AI/AN youth involved in the intervention. The Native STAND D&I Study was a national dissemination and implementation study coordinated by Oregon Health & Sciences University's Center for Healthy Communities Prevention Research Center, in partnership with the Northwest Portland Area Indian Health Board (NPAIHB) from 2014 to 2019. The NPAIHB runs the Northwest Tribal Epidemiology Center, which provides research, surveillance, and public health capacity building both regionally and nationally. The study was carried out in partnership with 48 Tribes and Tribal organizations who enrolled in the study.

The team used the RE-AIM framework, which looks at programmatic Reach, Effectiveness, Adoption, Implementation, and Maintenance, to guide their multisite evaluation plan [25]. The team closely monitored the implementation of the Native STAND curriculum at each site using fidelity calls with program educators and collected pre- and post-surveys from youth participants to identify changes in knowledge, behavior, and self-efficacy. The aims of this paper were to: (1) document differences in program effects from baseline to follow-up on predictors of sexual health outcomes for AI/AN youth, including self-esteem, communication skills, condom use intention and self-efficacy, STD/STI testing, and sexual behavior; (2) inform future dissemination and implementation efforts for Native STAND.

2. Materials and Methods

2.1. Study Design and Data

Data for this evaluation came from 960 AI/AN youth who participated in Native STAND from 2014 to 2019 and completed pre- and post-surveys. In the baseline paper (in review) we documented psychosocial predictors of adolescent health risk for youth involved in the Native STAND program and found that their baseline risk profiles are similar to non-AI/AN youth with the exception of tobacco use, where AI/AN youth reported higher rates of use than their non-AI/AN youth counterparts. A forthcoming publication describes barriers and facilitators to implementing Native STAND and factors affecting sustainability. The present study builds on these findings and explores differences in cultural connections, self-esteem, communication skills, condom use intention and self-efficacy, STI/STI testing, and sexual behavior between baseline and follow-up.

2.2. Study Participants and Setting

Beginning in November 2014, we recruited youth-serving organizations in Indian Country and Alaska to join the Native STAND study. From this recruitment effort, the research team selected a convenience sample of 48 sites. Educators from these sites attended a seven-day training in Portland, Oregon. OHSU followed sites for two years and provided them with $5000 per year to offset the cost of implementation supplies. Native STAND participants (AI/AN youth) were located in 16 states, including Alaska. Most of the sites were rural (75%) and from the western part of the United States (75%). Participants included AI/AN youth 15–24 who completed the Native STAND curriculum baseline and follow-up surveys. Our sampling frame was all youth attending Native STAND sessions at

48 sites. Active consent was obtained from the parents and guardians and youth assent was obtained from the youth prior to enrollment.

2.3. Data Collection and Management

The study protocol was reviewed and approved by OHSU (OHSU IRB #00734) and the Portland Area Indian Health Service Institutional Review Board (659942). All instruments were reviewed and approved by the IRB before data collection took place. Our team collected baseline and follow-up measures via paper surveys from youth who returned signed parental consent and personal assent forms to their site educator before starting Native STAND lessons. The surveys assessed a broad range of knowledge, attitudes, beliefs, intentions, behaviors, and skills relating to physical, sexual, mental, and psychosocial health. To ensure confidentiality of survey responses, each youth received a paper survey labeled with a unique study ID and a business reply mail manila envelope. Upon completing baseline and follow-up surveys, we instructed the participating youth to seal the envelope and return it to their educator, who mailed the envelopes to the Native STAND project office. We used REDCap (Research Electronic Data Capture) tools hosted at Oregon Health and Science University [26], to provide assistance with data and data management support for the study. We met with Native STAND site educators and community leaders prior to submission to ensure the findings corroborated with the communities' experiences.

2.4. Native STAND Intervention

Native STAND is a comprehensive sexual health curriculum for Native high school students that focuses on sexually transmitted infections, HIV/AIDS, and teen pregnancy prevention, while also covering drug and alcohol use, suicide, and dating violence [19] (www.HealthyNativeYouth.org, accessed on 15 January 2021). The 27 sessions support healthy decision-making through interactive discussions and activities that promote diversity, self-esteem, goals and values, team building, negotiation and refusal skills, and effective communication. The 1.5-h lessons contain stories from tribal communities that ground learning in cultural teachings. The curriculum draws on cultural teachings and values from across Indian Country and Alaska to strengthen cultural pride, not only for one's own tribe, but for all Native American tribes. The curriculum is flexible and can be easily adapted to the needs and constraints of those who implement it. Most educators did not have 1.5 h to teach each session, therefore, educators selected which parts of each lesson they wanted to complete. We documented implementation processes and practices during fidelity calls (Figure 1).
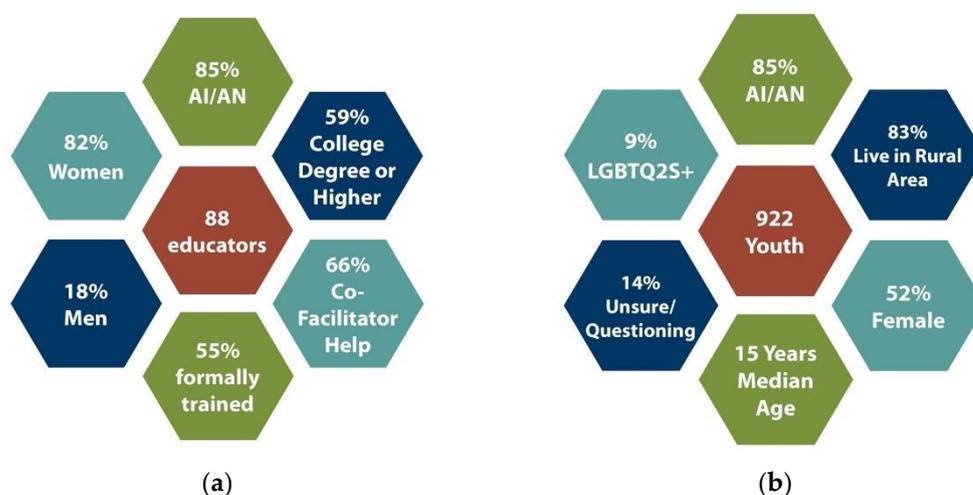

(a)   (b)

Figure 1. Profiles of Native STAND educators (**a**) and youth participants (**b**), 2015–2019.

2.5. Outcome Measures

We collected demographic information including age, race/ethnicity, gender, community location (urban or rural), and sexual orientation (straight/heterosexual, 2SLGBT+, unsure/don't know). We asked youth about their self-esteem, and their connection to their Native identity. We asked youth about their history with recreational drugs and alcohol. We also asked youth for information on their sexual activity, including history of oral sex, vaginal sex, and anal sex were collected. Participants who reported a history of oral, vaginal, or anal sex were also asked about the age of their sexual initiation and other aspects of their sexual activity, including STI testing, and pregnancy. We requested information from youth about their self-efficacy in using condoms. We also assessed recent experience with bullying, physical abuse, depression and suicidality. Finally, we asked youth about the level of social and community support.

2.6. Data Analysis

This study used a pre-test/post-test design to explore changes in health behavior (sexual behaviors, STI testing, drugs, and alcohol misuse) and health predictors (cultural connections, community, self-esteem, communication, and social support). Descriptive statistics such as mean (M) and standard deviation (SD) or frequency (n) and percent (%) were used to describe measures at pre- and post-test. Differences between pre- and post-test were analyzed using paired Wilcoxon signed-rank tests for continuous/count measures and McNemar's or Bowker's symmetry tests for categorical measures. To adjust for multiplicity, a Bonferroni corrected significance level was considered for each measure domain of demographics/background characteristics, drug and alcohol misuse, sexual risk behavior, self-esteem, cultural connections, harm—bullying, harm—physical abuse, harm—depression, harm—suicidality, social support, and community (see Table 1 for Bonferroni α for each domain). Sensitivity analyses for confounding due to demographic characteristics were performed using multivariable linear or logistic mixed-effects regression to examine if controlling for demographics changed conclusions (see Supplementary). A random intercept for youth repeated measures pre-to-post was included. Additional sensitivity analyses were performed to examine moderation by dose using number of received sessions were conducted using multilevel modeling that tested the time-point × dose pairwise interaction effect while additionally adjusting for site with youth nested within sites. Here, modeling was performed with pre-/post- × received all sessions vs. not all and continuous time between pre-to-post × number of sessions separately. For the latter, time and number of sessions were first sample mean centered before testing interactions. All analyses were performed using Stata, version 15.0 [27] and SAS v9.4 [28].

Table 1. Change from Baseline to Follow-up for Native STAND youth by survey subsection.

Measure	Baseline	Follow-Up	Test	*p*-Value
Demographics Characteristics (Bonferroni α = 0.0100)				
1. Gender			BST	0.53
Female	495 (51.6)	491 (51.2)		
Male	424 (44.2)	428 (44.6)		
Transgender/other	12 (1.3)	12 (1.3)		
Missing	29 (3.0)	29 (3.0)		
2. Sexual orientation			BST	0.002
Straight/Heterosexual	688 (71.7)	717 (74.7)		
LGBTQ2S+	80 (8.3)	93 (9.7)		
Unsure	127 (13.2)	95 (9.9)		
missing	65 (6.8)	55 (5.7)		
3. Race/Ethnicity: American Indian/Alaska Native	811 (84.5)	799 (83.2)	MCN	0.24
4. Age (years)	14.8 ± 1.6	15.1 ± 1.6	WSR	<0.001
5. Last grade level completed	8.5 ± 1.5	8.7 ± 1.6	WSR	<0.001

Table 1. *Cont.*

Measure	Baseline	Follow-Up	Test	*p*-Value
Sexual behaviors (Bonferroni α = 0.0015)				
1. Serious convo about sex w/friends			BST	<0.001
No	511 (53.2)	453 (47.2)		
Yes	267 (27.8)	345 (35.9)		
Decline to answer	68 (7.1)	42 (4.4)		
missing	114 (11.9)	120 (12.5)		
2. In convo, think about learned in NS?			BST	<0.001
No	134 (14.0)	78 (8.1)		
Yes	71 (7.4)	230 (24.0)		
Haven't talked friends about sex	54 (5.6)	32 (3.3)		
Missing	701 (73.0)	620 (64.6)		
3. In convo, share info learned in NS?			BST	<0.001
No	174 (18.1)	125 (13.0)		
Yes	40 (4.2)	200 (20.8)		
Haven't talked friends about sex	44 (4.6)	15 (1.6)		
Missing	702 (73.1)	620 (64.6)		
4. Ever oral sex			MCN	0.13
No	633 (65.9)	616 (64.2)		
Yes	168 (17.5)	195 (20.3)		
Decline to answer	68 (7.1)	61 (6.4)		
Missing	91 (9.5)	88 (9.2)		
5. How old oral sex first time	14.1 ± 1.6	14.2 ± 2.1	WSR	0.02
6. Ever vaginal sex			MCN	0.32
No	572 (59.6)	564 (58.8)		
Yes	216 (22.5)	239 (24.9)		
Decline to answer	65 (6.8)	61 (10.0)		
Missing	107 (11.2)	96 (6.4)		
7. How old vaginal sex first time	14.1 ± 1.8	14.4 ± 1.8	WSR	0.87
8. Last year vaginal sex			MCN	0.83
No	612 (63.8)	610 (63.5)		
Yes	166 (17.3)	183 (19.1)		
Decline to answer	8 (0.8)	6 (0.6)		
Missing	174 (18.1)	161 (16.8)		
9. Last month vaginal sex			MCN	0.73
No	694 (72.3)	699 (72.8)		
Yes	88 (9.2)	95 (9.9)		
Decline to answer	6 (0.6)	6 (0.6)		
Missing	172 (17.9)	160 (16.7)		
10. Last month vaginal sex no b.control			MCN	0.77
No	708 (73.8)	711 (74.1)		
Yes	43 (4.5)	55 (5.7)		
Not sure	19 (2.0)	18 (1.9)		
Decline to answer	14 (1.5)	13 (1.4)		
Missing	176 (18.3)	163 (17.0)		
11. Use condom last time had sex			MCN	0.38
No	86 (9.0)	91 (9.5)		
Yes	110 (11.5)	131 (13.7)		
Decline to answer	18 (1.9)	2 (1.3)		
Missing	746 (77.7)	726 (75.6)		

Table 1. *Cont.*

Measure	Baseline	Follow-Up	Test	*p*-Value
12. How often use condom vaginal sex			BST	0.06
Never	25 (2.6)	38 (4.0)		
Sometimes	91 (9.5)	87 (9.1)		
Always	84 (8.8)	95 (9.9)		
Decline to answer	15 (1.6)	15 (1.6)		
Missing	745 (77.6)	725 (75.5)		
13. Ever anal sex			MCN	0.89
No	756 (78.8)	767 (79.9)		
Yes	57 (5.9)	59 (6.2)		
Decline to answer	55 (5.7)	54 (5.6)		
Missing	92 (9.6)	80 (8.3)		
14. How old anal sex first time	14.4 ± 1.8	14.7 ± 1.9	WSR	0.12
15. Last year anal sex			MCN	0.61
No	779 (81.2)	787 (82.0)		
Yes	29 (3.0)	37 (3.9)		
Decline to answer	4 (0.4)	1 (0.1)		
Missing	148 (15.4)	135 (14.1)		
16. Last month anal sex			MCN	0.48
No	797 (83.0)	804 (83.8)		
Yes	12 (1.3)	19 (2.0)		
Decline to answer	4 (0.4)	1 (0.1)		
Missing	147 (15.3)	136 (14.2)		
17. Use condom last time anal sex			MCN	0.38
No	25 (2.6)	25 (2.6)		
Yes	22 (2.3)	27 (2.8)		
Decline to answer	9 (0.9)	5 (0.5)		
Missing	904 (94.2)	903 (94.1)		
18. How often use condom anal sex			BST	0.25
Never	13 (1.4)	17 (1.8)		
Sometimes	11 (1.2)	15 (1.6)		
Always	19 (2.0)	19 (2.0)		
Decline to answer	12 (1.3)	6 (0.6)		
Missing	905 (94.3)	903 (94.1)		
19. Forms of b control used				
Don't use	309 (32.2)	321 (33.4)	MCN	0.32
Oral	44 (4.6)	43 (4.5)	MCN	0.86
Condom	68 (7.1)	67 (7.0)	MCN	0.90
Shot	32 (3.3)	35 (3.7)	MCN	0.56
Patch	2 (0.2)	2 (0.2)	MCN	1.00
Ring	1 (0.1)	0 (0.0)	n/a	n/a
IUD	7 (0.7)	10 (1.0)	MCN	0.26
Implant	17 (1.8)	25 (2.6)	MCN	0.07
Morning after	9 (0.9)	7 (0.7)	MCN	0.59
Other	10 (1.0)	11 (1.2)	MCN	0.81
20. Ever pregnant or someone pregnant			MCN	0.21
No	795 (82.8)	783 (81.6)		
Yes	21 (2.2)	34 (3.5)		
Don't know	19 (2.0)	20 (2.1)		
Decline to answer	44 (4.6)	47 (4.9)		
Missing	81 (8.4)	76 (7.9)		

Table 1. *Cont.*

Measure	Baseline	Follow-Up	Test	*p*-Value
21. Last year been or got pregnant			n/a	n/a
No	801 (83.4)	809 (84.3)		
Yes	13 (1.4)	0 (0.0)		
Don't know	0 (0.0)	7 (0.7)		
Decline to answer	1 (0.1)	1 (0.1)		
Missing	145 (15.1)	143 (14.9)		
22. Ever tested STD/STI			MCN	0.52
No	726 (75.6)	706 (73.5)		
Yes	76 (7.9)	93 (9.7)		
Don't know	38 (4.0)	38 (4.0)		
Decline to answer	31 (3.2)	36 (3.8)		
Missing	89 (9.3)	87 (9.1)		
23. Last year tested STD/STI			MCN	0.07
No	747 (77.8)	724 (75.4)		
Yes	50 (5.2)	66 (6.9)		
Don't know	1 (0.1)	8 (0.8)		
Decline to answer	2 (0.2)	1 (0.1)		
Missing	160 (16.7)	161 (16.8)		
24. Ever tested positive STD/STI			MCN	0.18
No	783 (81.6)	782 (81.5)		
Yes	16 (1.7)	10 (1.0)		
Don't know	0 (0.0)	3 (0.3)		
Decline to answer	2 (0.2)	3 (0.3)		
Missing	159 (16.6)	162 (16.9)		
25. Last year tested positive STD/STI			n/a	n/a
No	789 (82.2)	786 (81.9)		
Yes	0 (0.0)	0 (0.0)		
Don't know	8 (0.8)	6 (0.6)		
Decline to answer	1 (0.1)	1 (0.1)		
Missing	162 (16.9)	167 (17.4)		
26. Believe wait older to have sex	3.1 ± 0.9	3.1 ± 0.8	BST	0.02
27. Believe OK to have sex if condom	3.2 ± 1.3	3.5 ± 1.2	BST	<0.001
28. Believe OK to have sex w/a steady partner	2.5 ± 0.9	2.7 ± 0.9	BST	<0.001
29. Believe condoms should always use	3.2 ± 0.8	3.3 ± 0.7	BST	0.02
30. How sure tell partner start condoms			BST	0.02
Not sure at all	113 (11.8)	97 (10.1)		
Kind of sure	116 (12.1)	144 (15.0)		
Definitely sure	511 (53.2)	571 (59.5)		
Decline to answer	172 (17.9)	120 (12.5)		
Missing	48 (5.0)	28 (2.9)		
31. How sure tell new person condoms			BST	0.002
Not sure at all	92 (9.6)	88 (9.2)		
Kind of sure	76 (7.9)	96 (10.0)		
Definitely sure	598 (62.3)	628 (65.4)		
Decline to answer	143 (14.9)	118 (12.3)		
Missing	51 (5.3)	30 (3.1)		
32. How sure can use condom correctly			BST	<0.001
Not sure at all	147 (15.3)	76 (7.9)		
Kind of sure	204 (21.3)	171 (17.8)		
Definitely sure	376 (39.2)	549 (57.2)		
Decline to answer	179 (18.7)	132 (13.8)		
Missing	54 (5.6)	32 (3.3)		

Table 1. *Cont.*

Measure	Baseline	Follow-Up	Test	*p*-Value
33. If wanted, how sure get condom			BST	<0.001
Not sure at all	190 (19.8)	104 (10.8)		
Kind of sure	188 (19.6)	199 (20.7)		
Definitely sure	396 (41.3)	522 (54.4)		
Decline to answer	130 (13.5)	97 (10.1)		
Missing	56 (5.8)	38 (4.0)		
Harm-bullying (Bonferroni α = 0.0250)				
1. Past year, been bullied			MCN	<0.001
No	533 (55.5)	581 (60.5)		
Yes	350 (36.5)	293 (30.5)		
Decline to answer	39 (4.1)	60 (6.3)		
Missing	38 (4.0)	26 (2.7)		
2. Past year, been emotionally abused by intimate partner			MCN	0.12
No				
Yes	783 (81.6)	754 (78.5)		
Decline to answer	97 (10.1)	121 (12.6)		
Missing	42 (4.4)	56 (5.8)		
	38 (4.0)	29 (3.0)		
Harm-physical abuse (Bonferroni α = 0.0500)				
1. Past year, hit, slapped, physically hurt by intimate partner			MCN	0.39
No				
Yes	791 (82.4)	791 (82.4)		
Decline to answer	93 (9.7)	84 (8.8)		
Missing	39 (4.1)	53 (5.5)		
	37 (3.9)	32 (3.3)		
Harm-depression (Bonferroni α = 0.0500)				
1. Past year, felt sad, lost, hopeless, lonely, or depressed			MCN	0.70
No				
Yes	475 (49.5)	488 (50.8)		
Decline to answer	333 (34.7)	341 (35.5)		
Missing	88 (9.2)	85 (8.9)		
	64 (6.7)	46 (4.8)		
Harm-suicidal thoughts/attempt (Bonferroni α = 0.0167)				
1. Ever thought about suicide			MCN	0.60
No	541 (56.4)	536 (55.8)		
Yes	287 (29.9)	289 (30.1)		
Decline to answer	90 (9.4)	106 (11.0)		
Missing	42 (4.4)	29 (3.0)		
2. Ever attempted suicide			MCN	0.13
No	662 (69.0)	664 (69.2)		
Yes	187 (19.5)	175 (18.2)		
Decline to answer	68 (7.1)	90 (9.4)		
missing	43 (4.5)	31 (3.2)		
3. Last year attempted suicide			MCN	0.57
No	737 (76.8)	733 (76.4)		
Yes	101 (10.5)	95 (9.9)		
Decline to answer	9 (0.9)	11 (1.2)		
missing	113 (11.8)	121 (12.6)		

Table 1. *Cont.*

Measure	Baseline	Follow-Up	Test	*p*-Value
Social support (Likert 1 = Strongly Disagree-5 = Strongly Agree) (Bonferroni α = 0.0083)				
1. Ask help family	3.7 ± 1.1	3.8 ± 1.1	WSR	0.38
2. Share thoughts/feelings family	3.8 ± 1.1	3.7 ± 1.1	WSR	0.48
3. Support from friends	4.1 ± 0.9	4.1 ± 0.9	WSR	0.11
4. Talk problems with friends	3.6 ± 1.1	3.7 ± 1.1	WSR	0.03
5. Factor 1 (2 items; α = 0.732):	3.8 ± 1.0	3.8 ± 1.1	WSR	0.95
6. Factor 2 (2 items; α = 0.862):	3.8 ± 0.9	3.9 ± 0.9	WSR	0.02
Community safety/community (Likert 1 = Strongly Disagree-5 = Strongly Agree) (Bonferroni α = 0.0125)				
1. Feel safe	3.9 ± 0.9	3.9 ± 0.9	WSR	0.55
2. Would miss	3.9 ± 1.1	4.0 ± 1.1	WSR	0.07
3. Home	4.4 ± 0.8	4.3 ± 0.8	WSR	0.02
4. Factor (3 items; α = 0.635):	4.1 ± 0.7	4.1 ± 0.7	WSR	0.61

Abbreviations: WSR, Wilcoxon Signed-Ranks test; MCN, McNemar's test; BST, Bowker's symmetry test; b. control, birth control; convo, conversation.

3. Results

Baseline data have been extensively reported on in prior publications (in review). A total of 960 (65.9%) youth completed both pre- and post-tests (of 1456 participants that completed a pre-test), that made up the analytic sample. For the duration of time from pre- to post-intervention, two-thirds (66.6%) had follow-up time less than three months with a median time of 2.3 months (IQR = 2.7). The average number of lessons out of 27 possible lessons was 23.0 (SD = 6.6, median = 27.0). Each site was allowed to choose what lessons to implement, however.

Demographics between pre-test and post-test subjects were already compared in the original submission, with data given at the beginning of Table 1. Post-test youth were older with a higher grade level completed at post as expected and were not different in gender or race proportions. There were differences in proportions of sexual orientation, with a lower percent unsure and a higher percent straight/heterosexual at post/follow-up. The overall results are presented next for pre- vs. post- comparisons by survey domain.

3.1. Demographics, Culture, and Drug or Alcohol Misuse

Age ($p < 0.001$), last grade level completed ($p < 0.001$), and sexual orientation ($p = 0.0017$) were significantly different between pre-test and post-test (Table 1). No differences in self-esteem items or scale scores between baseline and follow-up were significant after Bonferroni correction (Table S1). No differences in the culture items or scale scores were statistically significant between baseline and follow-up (Table S1). No differences in drug or alcohol misuse scores were statistically significant between baseline and follow-up (Table S1).

3.2. Predictors of Sexual Behavior

Communication. A significantly higher percentage of youth at post-test reported having a serious conversation about sex with their friends (post 36% vs. pre 28%, $p < 0.001$), and thinking about things learned in Native STAND during this conversation (post 24% vs. pre 7%, $p < 0.001$) and sharing things learned in Native STAND during this conversation (post 21% vs. pre 4%, $p < 0.001$). A higher percentage at post-test also reported stronger agreement with "Believe is okay for people my age to have sex as long as they use a condom" (post 60% agree/strongly agree vs. pre 49%, $p < 0.001$) and "Okay to have sex with steady boyfriend or girlfriend" (post 58% vs. pre 47%, $p < 0.001$) (Table 1). Condom use self-efficacy. Youth at post-test also reported being significantly surer they could use a condom correctly or explain to partner how to use correctly (post 57% definitely sure vs. pre 39%, $p < 0.001$) and that if they wanted to get a condom, they were surer could get one (post 54% definitely sure vs. pre 41%, $p < 0.001$) (Table 1).

3.3. Predictors of Sexual Behavior

Harm–bullying. Significantly less youth reported being bullied in the past year at post-test compared to pre-test (post 31% vs. pre 37%, *p* = 0.0002) (Table 1). Harm–physical abuse. No differences in physical abuse scores were statistically significant between baseline and follow-up (Table 1). Harm–depression. No differences in depression scores were statistically significant between baseline and follow-up (Table 1). Harm–suicidality. No differences in suicidal thoughts and attempts were statistically significant between baseline and follow-up (Table 1). Social support. No differences in social support items or scale scores were statistically significant between baseline and follow-up (Table 1). Community. No differences in social support items or scale scores were statistically significant between baseline and follow-up (Table 1).

3.4. Multivariable Modeling Sensitivity Analyses

Multivariable modeling controlling for demographic characteristics yielded consistent conclusions for all measures, with the exception of reported use of the patch form of birth control (Table S1). As seen in Table 1, only two youth reported using this form at pre- and post- so while a bivariate exact McNemar's test was possible, multivariable modeling did not converge due to separation/low prevalence. All other conclusions were consistent with Table 1.

3.5. Dose Moderation Analyses

When testing for differences in effectiveness related to program dosage, none of the dose interaction effects were statistically significant except for a "Family" score used to assess social support. This subscale score was created by averaging the 1 = Strongly Disagree to 5 = Strongly Agree Likert-type response rating scales for the two items: "I can share my thoughts and feelings with someone in my family" and "If I had a personal problem, I could ask someone in my family for help." Two factors of social support resulted, based on parallel analysis: Family social support (α = 0.73) and Friends social support (α = 0.86), which explained 83.7% of the variance in the social support items. Here, the average Family social support subscale scores were 3.85 at pre- for those with <27 sessions and 3.86 at pre- for those with all 27 sessions, compared to 3.75 at post-with <27 versus 3.96 at post-with all 27 (*p* = 0.02). Although statistically significant, this change is modest. Future research could explore curriculum effects on social support from family and friends over time.

4. Discussion

This is the first sufficiently powered study to evaluate the impact of Native STAND, a culturally relevant sexual health EBI for AI/AN high school students. The results demonstrate it had an immediate post-intervention effect on sexual health communication skills, promoting serious peer to peer conversations about sex. Participants were more likely to reflect on lessons learned during Native STAND and share that information with their peers. Native STAND also changed youth's perception of sexual risk and confidence negotiating condom use. At post-test, significantly more youth felt it was okay for people their age to have sex if they used a condom than at pre-survey, and a greater percentage of youth reported it was okay to have sex with a steady boyfriend or girlfriend. Importantly, youth reported greater confidence knowing how to use a condom correctly or explain its use to their partners. Perceptions around condom availability also increased from pre- to post-survey.

Native STAND participants also reported less past-year bullying at post-test—indicating the curriculum may have also improved peer communication and strengthen youth response when faced with bullying situations. Differences in age and sexual orientation were observed from pre- to post-survey, likely related to normal adolescent sexual development, as youth grow their views about sex and their sexual identity may change. Critically, Native STAND was equally effective for youth across age-groups, and for youth who identified as

Two Spirit and LGBT, an important finding that validates the curriculum "honors diversity" and inclusivity for program participants—a core value of the program.

Our findings are similar to other research in this domain like the Respecting the Circle of Life program, where condom self-efficacy, condom use intention, and talking with family about HIV/AIDs increased as a result of the intervention [14–17]. Other longitudinal research such as the Multimedia Circles of Life and Native VOICES reported increases in condom use self-efficacy post intervention. The aforementioned programs were delivered at basketball camps, online, and in other community settings. Developing and evaluating culturally grounded sexual health curricula that can be implemented in diverse settings, with different age groups, will expand the number of EBIs available to AI/AN communities that support youth across the lifespan.

4.1. Limitations

There are several limitations to this study. First, the sites utilized different recruitment strategies in each community to create their Native STAND cohorts and deliver the curriculum. There was a great deal of variation in the delivery methods and fidelity between sites and facilitators. Second, results rely on data from surveys. Survey questions were sensitive in nature, it is possible that youth were more likely to skip or alter their responses in the pre and post surveys due to a lack of trust in the confidentiality of the Native STAND project. This might have affected the reporting of sexual orientation and resulted in underreporting of the number of youth identifying as 2SLGBT. Additionally, dose data were only available for approximately 50% of youth. It is possible that intervention effects would have been significant from pre- to post-survey if dose data were available for all participants. Study conditions may impact the effectiveness of Native STAND. This study reports on the effectiveness of Native STAND in this study population, results may not be generalizable or conclusive to all AIAN populations and contexts.

4.2. Next Steps

Since the completion of the Native STAND D&I study, the research team has met with curriculum facilitators to identify areas for improvement. NPAIHB is now using their feedback to update the curriculum for medical accuracy and align the lessons with trauma informed practice. NPAIHB plans to release Native STAND updates in 2021 with plans to disseminate it broadly on www.HealthyNativeYouth.org (accessed on 15 January 2021), in diverse AI/AN school and community settings. Changes in dosage are also being considered. Many Native STAND educators felt the 90-min sessions were too long. Dose findings from this study indicate that "family social support" was the only construct moderated by dose, where participants with the full dose (27 sessions) reported significant increases in communication with their family and friends, compared with participants receiving <27 sessions. Future studies will explore what aspects of Native STAND have the most significant effect on building adolescent health and wellbeing.

5. Conclusions

The Native STAND D&I study demonstrates the feasibility and acceptability of implementing Native STAND across diverse AI/AN community settings, each with diverse community needs, cultural values, programmatic capacity. Native STAND improved important psychosocial predictors of sexual health outcomes for AI/AN youth, including peer and family communication skills and condom use intention and self-efficacy. The Native STAND curriculum helps fill a critical gap in evidence-based sexual health programs that reflects the unique needs and experiences of AI/AN youth.

Supplementary Materials: The following are available online at https://www.mdpi.com/article/10.3390/adolescents1030024/s1, Table S1: Change from Baseline to Follow-up for Native STAND youth for non-significant subsections, 2014–2019.

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