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Type 2 Diabetes Science and American Indian/Alaska Native Culture: Creating a National K-12 Curriculum Prevention Strategy for Native Youth

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Abstract

Preventing and reducing the onset of type 2 diabetes among American Indian/Alaska Native youth requires educational strategies to impact knowledge, attitudes, and cognitive decision-making skills. In an unparalleled effort to address the growing epidemic of type 2 diabetes in tribal communities, eight tribal colleges and three federal agencies collaborated to develop and implement a K-12 Diabetes Education in Tribal Schools (DETS) curriculum. This article outlines the scientific and cultural development of creating a comprehensive K-12 science curriculum as a targeted health prevention strategy.

Introduction

The attributes of unhealthy risk behaviors begin early on, and according to the Center for Disease Control and Prevention “*establishing healthy behaviors during childhood and maintaining them is easier and more effective than trying to change unhealthy behaviors during adulthood.*”¹ Schools play a crucial role in this endeavor but lack evidence-based curricula, particularly materials that go beyond the academic elements to address the socio-cultural context in which health behaviors are formed. As part of a national effort to decrease the incidence of type 2 diabetes among American Indian/Alaska Natives (AI/ANs), a first-of-its-kind, K-12, diabetes prevention curriculum – Diabetes Education in Tribal Schools (DETS) - was developed. What makes this curriculum unique is the blending of diabetes science and the American Indian cultural context.

Background

American Indians and Alaska Natives bear a disproportionate burden of type 2 diabetes. In 2009, the age-adjusted prevalence of diabetes among AI/AN over 20 years of

age was more than double the rate for non-Hispanic whitesⁱⁱ. According to the Indian Health Service, in a ten-year period between 1994 and 2004, the age-adjusted prevalence of diabetes doubled among those less than 35 years of age, and while still rare among children, there was a 68% increase among AI/AN youth, 15-19 years of ageⁱⁱⁱ. Such early onset of type 2 diabetes for AI/ANs results in more years of disease burden and a higher probability of developing diabetes-related complications over the life span^{iv}. AI/AN youth are not only at high risk for the disease but are directly impacted by diabetes related health issues in their families and their communities. As such, effective diabetes prevention programs targeting AI/AN youth are seen as a priority in education and public health for this population^v.

The foundation for developing the DETS curriculum was the Diabetes Prevention Program (DPP), a multi-centered clinical randomized trial among pre-diabetic populations that provided significant evidence for preventing the onset of type 2 diabetes through an intensive lifestyle prevention strategy^{vi}. Subsequent lifestyle modification studies, including several among AI/AN populations, have demonstrated success in delaying and preventing the onset of the disease^{vii}. Moore, Dodge Francis & DeBruyn emphasize the importance of educating AI/AN youth about the results of the DPP clinical trials and the effectiveness of lifestyle interventions^{viii}. Based on the findings of DPP, the DETS curriculum teaches throughout that the occurrence of type 2 diabetes does not have to be a foregone conclusion for young AI/ANs.

A National Diabetes Education Curriculum for American Indian and Alaska Native Students

The creation of a diabetes-based science education for Tribal schools was no small feat. In 2001, the IHS Tribal Leaders Diabetes Committee (TLDC) requested that the congressionally authorized Diabetes Mellitus Coordinating Committee (DMCC) address the epidemic of type 2 diabetes among American Indian/ Alaska Native (AI/AN) communities. The federal members of the Coordinating Committee – the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Institutes of Health (NIH), in partnership with the Native Diabetes Wellness Program, Centers for Disease Control and Prevention (CDC), and the Division of Diabetes Treatment and Prevention, Indian Health Services (IHS), - rose to the challenge with an unprecedented interagency agreement to fund and support tribal educators to create the DETS curriculum.

Eight Tribal Colleges and Universities (TCU) were funded to create the curriculum: Cankdeska Cikana Community College (Fort Totten, North Dakota); Fort Peck 2 Community College (Poplar, Montana); Haskell Indian Nations University (Lawrence, Kansas); Keweenaw Bay Ojibwa Community College (Baraga, Michigan); Leech Lake Tribal College (Cass Lake, Minnesota); Northwest Indian College (Bellingham, Washington); Southwestern Indian Polytechnic Institute (Albuquerque, New Mexico); and Stone Child College (Box Elder, Montana). The knowledge of tribal educators was essential to creating a curriculum that was both scientifically rigorous and responsive to the socio-cultural needs of tribal youth, their families, and their tribal communities.

The curriculum's foremost intention is to inform, educate, and build science skills for AI/AN students with both teachers and students as active participants. Many teachers

are not from the communities in which they teach and are eager to better understand the historical, cultural, and health issues of their students. In recognizing this and the myriad other challenges faced by AI/AN students, DETS curriculum developers sought to create, as Bruner suggests, a “communities of learners, a participatory, proactive, communal, collaborative process of constructing meanings rather than receiving them”^{ix}. With a guiding mantra of *Health Is Life in Balance* the curriculum includes seven multidisciplinary supplement units spanning the K-12 grade levels. There are three primary goals:

1. To increase the understanding of health, diabetes, and maintaining life in balance among American Indian/Alaska Native students;
2. to increase American Indian and Alaska Native students’ application of scientific and community [cultural] knowledge about health, diabetes, and maintaining balance; and
3. to increase interest in science and health professions among American Indian and Alaska Native students.

The intention is that the curriculum will be adopted by Tribal, Charter and public school systems nation-wide to advance the effectiveness of culturally relevant education and enhances a national diabetes prevention effort.

Science and Culture

DETS is a state-of-the-art science curriculum. The curriculum meets the National Science Standards, which provide criteria to judge progress toward a national vision of learning and a teaching system that promotes excellence^x. In particular, the DETS curriculum focuses on *learning* science by *doing* science^{xi}. In addition to meeting National Science Standards, there are two specific units at the middle school level that address National Social Studies Standards and one specific unit at the high school level

targeting the National Health Standards. The sequenced and interrelated continuum of diabetes-based education is supported by the premise that science should be seen as inquiry. The BSCS 5E instructional Model was developed in the late 1980's and is utilized to support the curriculum foundation of teacher coherence and student understanding of scientific knowledge and skills^{xii}. Each lesson includes learning activities and promotes collaborative learning in the classroom.

DETS is also an innovative, culturally responsive curriculum. The curriculum allows for the cultural values and the lens in which students see their world to be integrated within the experience of connecting health and diabetes. The curriculum recognizes and honors the geographic, historical, and cultural diversity among AI/AN tribes. It allows students to frame a relationship between place and health that reflects their connectedness to self, family, community, and tribe. The curriculum also facilitates the integration of traditional knowledge and native science^{xiii} with state-of-the-art diabetes science to allow students to see themselves as future scientists and health professionals. Ultimately, the DETS curriculum creates a framework built on excellence and equity in science education reflected through culturally relevant contexts.

Preliminary Curriculum Evaluation

During the fall 2007 and winter 2008 school semesters, the DETS curriculum was evaluated in schools in 14 states to examine how teachers utilized the curriculum in their respective classrooms and how students responded to the curriculum across a broad geographical and cultural spectrum^{xiv}. Preliminary findings indicate that the DETS curriculum had an effective impact relative to its three goals. Across each content area,

teachers consistently rated the Native American content of the DETS curriculum as *strong* or *very strong*. Most importantly, students consistently showed statistically significant knowledge gains across all content areas and all grade levels (elementary, middle, high)..

Conclusion:

The DETS curriculum, available from the Indian Health Service’s Division of Diabetes Treatment and Prevention, presents diabetes science framed in the culturally relevant contexts of American Indians and Alaska Natives. The curriculum was carefully crafted to meet national science education standards, and can serve as a supplement for science, social science, and health education lessons across all grade levels. The earlier grade levels can also be adapted for Head start and pre-K education.

Approximately 29,000 units spanning the k-12 curriculum series have been distributed across the country. National organizational support has been successful through resolutions from the National Congress of American Indians, National Indian Education Association and most recently, a recommendation by the Indian Affairs Manual for Health and Wellness in Bureau of Indian Education Schools, K-12. The success of the curriculum and associated learning materials, such as the Eagle Books^{xv}, has led to the development of similar curricula for other high-risk populations.

For more information pertaining to the DETS curriculum:

<http://www3.niddk.nih.gov/fund/other/dets/index.htm>

To order the curriculum:

<http://www.ihs.gov/MedicalPrograms/Diabetes/RESOURCES/Catalog/rde/index.cfm?module=catalog&opt=2>

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