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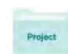

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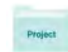

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Social Determinants of Health for Native Hawaiian Children and Adolescents

David M.K.I. Liu MD, PhD, JD and Christian K. Alameda PhD

Abstract

Introduction: Traditional Hawaiian thought places children in a position of prominence in the family. Yet in Hawai'i, Native Hawaiian children and adolescents face significant inequity in health outcomes. From prenatal alcohol and tobacco use, late or no prenatal care, macrosomia as well as low birth rates, to exclusive breastfeeding rates at 6 months, and high rates of infant mortality, Native Hawaiians face inequities in pre and early childhood indicators. During childhood and adolescence, Native Hawaiians experience high rates of obesity, and physical, mental and sexual abuse. This review examines the determinants behind the health inequities encountered by Native Hawaiian children and adolescents, and contextualizes those inequities s in a human rights-based approach to health.

Methods: a literature review was conducted for relevant research on Native Hawaiian and other indigenous children and adolescents. Existing data sources were also reviewed for relevant Native Hawaiian data.

Results: There is a significant dearth of data on the determinants of health for Native Hawaiian children and adolescents. Some prenatal data is available from the Prenatal Risk Assessment Monitoring System, while selected youth data is available from the Youth Behavioral Risk Factor system. Available data show significant inequities for Native Hawaiian children and adolescents, compared to other groups in Hawai'i. Based on comparisons with other indigenous and marginalized peoples, the etiology of these disparities may be a lack of health equity, deriving from multigenerational trauma and discrimination as well as poverty and inequities of housing, education, environment, healthcare access, and social capital.

Conclusions: The significant barriers facing Native Hawaiian children and adolescents achieving their full potential constitute a challenge to the fulfillment of the human right to health. Future research needs to more fully articulate the linkage between the health status of Native Hawaiian children and adolescents, the determinants of that status, and the requirements of the human right to health. Needed particularly are longitudinal studies which provide data that may link multigenerational trauma and discrimination to poverty and other factors, ultimately producing healthy inequity for Native Hawaiian children and adolescents.

Introduction

Traditionally, the place of the child in Native Hawaiian culture was sacred: *he lei poina 'ole ke keiki*. A lei never forgotten is the beloved child.[1] However, in current Hawai'i, Native Hawaiian children and adolescents face a range of health inequities: how did these changes occur?

Prior to European contacts, Native Hawaiians were a healthy people.[2] Subsequently, Native Hawaiian contacts with Europeans, beginning in 1778, had violent and long-lasting effect upon Hawaiian society.[3] The violence permeated every level, from disruption of traditional ontology and epistemology and violent displacement with Christianity and other Western systems to the appropriation of lands, loss of traditional economy, and ultimately the loss of self-government.[4-6] Because of these factors and introduced disease, depopulation was approximately 95%, and Native Hawaiians continue to experience a level of health significantly degraded from that of 1778.[2,7]

As Native Hawaiians became a minority in their own homeland, they were also marginalized in the political economy. From a position of preeminence in the Kingdom, Native Hawaiians have progressively lost representation in the Territory and then State.[8] From an agricultural and aquacultural system able to support a population up to one million, including classes not engaged in food production, Hawai'i is now 90 percent or more dependent on outsides sources for sustenance.[9] The Hawaiian culture has been commodified along with the land, so that it is currently largely associated with the tourism industry.[10-12] The Hawaiian language, although one of two official State languages, is still not recognized in everyday, and particularly legal arenas. It is important to emphasize at this point, however, that there is a significant tradition of resistance and persistence among Native Hawaiians.[13,14] It has never been a process of passive victimization to foreign politics, economics, cultures and disease. Instead, from the earliest days of encounters with the West, Native Hawaiians have resisted the violence of colonization and assimilation. Indeed, many interpret the foundation and elaboration of the Kingdom as the most basic effort of the *ali'i* (chiefs) to preserve and perpetuate the role of Native Hawaiians in their own governance.[13,15] To the end, an overwhelming majority of Native Hawaiians strove to strengthen both the domestic and international strength of the Kingdom.[14] The last Hawaiian monarch, Queen Lili'uokalani, indeed, did not abdicate her throne, but temporarily yielded governance to the overwhelming military power of the United States, specifically remembering the experience of Kauikeaouli, Kamehameha III, who faced a similar situation with Great Britain, who in fact did restore self-governance to the Kingdom in 1843.[16] Although the United States to date has not corrected the self-admitted act of war that constituted the overthrow, Native Hawaiians continued to work to regain self-governance and perpetuate their culture and identity.[13]

Methodology

We conducted a review of literature through PubMed, as well as obtaining data from the PRAMS and YRBS The keywords "Native," "Hawaiian," "child," and "health" were searched. Because of the diversity and relative small number of studies, from qualitative to quantitative, no attempt was made to evaluate individual studies. For the PRAMS and YRBS data, data was analyzed using SPSS, and compared the results for Native Hawaiians to all other groups combined, excluding Native Hawaiians.

Results

Prenatal and Infant Health Indicators

One study examined perinatal and infant health indicators for Native Hawaiians and Caucasians.[17] Hawaiian mothers were younger, more likely to be unmarried, and had higher parity. Hawaiian infants were more likely to be preterm. Infant mortality for Hawaiians was only significantly different for normal birthweight, full term babies. After controlling for age, parity, education and prenatal care, Native Hawaiian women were not significantly different than Caucasian

women. The authors concluded that the mortality differential was due to poverty and environmental factors. Another study, examining gestational diabetes, found inequities for Native Hawaiian mothers.[18] Native Hawaiian women who are pregnant are also statistically more likely to experience interpersonal violence before or during a recent pregnancy during the years 2004-2008. Native Hawaiian mothers are more likely to engage in binge drinking of alcohol, smoke in the three-month prior to pregnancy, and use illicit drugs in the month before pregnancy. Native Hawaiian mothers who are pregnant are also more likely to be obese than mothers of other ethnicities, increasing their risk for adverse pregnancy and neonatal outcomes, per data from PRAMS from 2000 to 2007.

Although Hawai'i as a whole has breastfeeding initiation rates higher than the national average, Native Hawaiian women have breastfeeding initiation rates lower than both state and national rates, with Native Hawaiian women never initiating breastfeeding significantly more than women of other races and ethnicities since 2000.[19] However, improvement is occurring for both groups, with no significant difference for 2006-2007. For Native Hawaiian women who do initiate breastfeeding, many do not maintain exclusive breastfeeding beyond 20 weeks.[20]

Native Hawaiian infants slept on their backs significantly less than infants of other races and ethnicities. Both groups are improving since 2000 to 2001, but the inequity remains. Native Hawaiian mothers are also much more likely to use the Supplemental Nutrition Program for Women, Infants and Children than mothers of other ethnicities.

Obesity

One study in Hilo found that although Native Hawaiian males were significantly more obese than non-Hawaiians after age six, that degree of Hawaiian ancestry was not significantly related to adiposity.[21] Degree of Native Hawaiian ancestry was significantly associated with body fat distribution, but not overall adioposity in an earlier study.[22] And although education has been significantly associated with BMI in other populations, in the Hilo study it was only significant for fathers' educations in third grade Hawaiian girls.

Mental Health and Suicide

In examining YRBS data from 2003 through 2007,

Smoking Among Adolescents

In Hilo, one study determined that in univariate analysis that Hawaiian primary ethnic identity was significantly associated with trying smoking and being a current smoker, this association disappeared with multivariate analysis.[23,24] Instead, the most salient factors were peer and parental smoking, and attendance at a public school.

Infectious Disease

Native Hawaiian and Pacific Islander children have a much higher incidence of methicillin-resistant Staphlococcus aureus osteomyelitis and cellulitis.[25,26]

Mental Health

Native Hawaiian adolescents are significantly more likely to have any DSM diagnosis.[3] This difference was primarily driven by overanxiousness and obsessive compulsive disorder diagnoses. Gender differences also followed these patterns, with girls having more diagnoses than boys, with a similar distribution of individual diagnoses. Disruptive behavior comorbidities were higher for boys, while both Hawaiian and non-Hawaiian youth had higher than national average rates of substance abuse.

Suicide

Overall, suicide is the third highest cause of death for adolescents in the United States.[27] It is the second leading cause of death for 15 to 24 year olds, and males in Hawai'i complete suicide more often than females by a ratio of three to one, with Native Hawaiians having higher rates of suicide than other ethnic groups. Native Hawaiian youth aged 10 to 14, while constituting only 27% of that demographic, are 50% of completed suicides.[28] Overall, Native Hawaiian youth have a higher lifetime prevalence of suicide attempts than other ethnic groups.

Common risk factors for economically disadvantaged groups include poverty, discrimination, high school dropoff, pregnancy and single parent households.[29] In Hawai'i, Yuen et al identified Hawaiian cultural identification, depression, educational level and the educational level of the main wage earner.[30] A different study identified substance abuse as a risk factor for suicidal ideation, attempts and completion.[31] Liminal periods, particulary between middle school and high school and high school and adulthood were also periods of higher risk for suicide.[32]

Self-Perception

In the area of self-perception, cultural loss is theorized to have traumatized the most vulnerable of the Native Hawaiian community – its children. Social determinants of health, such as a child's school environment, family income, place of residence, community resources and activities, health care access, parental support, and community empowerment shape the way Hawaiian children see themselves. This self-perception provides the framework for the attitudes children develop regarding their health, and this self-perception often continues to adulthood.

Self-perception studies with children were first conducted in the early 1950s with African Americans in response to the desegregation movement. When African American children were asked to choose between a white doll and black doll on socially acceptable preferences, black children chose the white doll (Clark, 1950). Similarly, when Hawaiian children were asked to choose between White, Japanese, and Hawaiian photos, with respect to positive physical and social attributes, Hawaiian children selected the White and Japanese photos (Alameda, 1998).

Providers

As with many minority populations, the pediatric providers for Native Hawaiian children and adolescents are often not Native Hawaiian.[33] Recent data indicated that only 0.6% of all board-certified pediatricians were Native Hawaiian or Pacific Islander (NHPI) in 2007. In previous years, however, NHPI pediatricians were aggregated with Asian pediatricians (AANHPI). Comparatively, 0.6% of patients were NHPI in 2007; in previous years, aggregated AANHPI patients constituted 5.3% (1993) and 6.7% (2000) of all patients seen. For all of the underrepresented pediatricians included in the surveyes, they were statistically more likely to see patients from

underrepresented groups than non-minority physicians, including Asian physicians.

Discussion

Contextually, several studies have emphasized that both risk and resiliency factors are at least additive, and may need to be analyzed in terms of levels, rather than the previous view of upstream and downstream.[34,35] Thus, in examining the matrix of risk and resilience, certain factors may or may not be more pertinent, given the diversity of the Native Hawaiian population: for Native Hawaiian children and adolescents with affluent, educated parents, it may be that their degree of cultural affiliation has more explanatory power than for children with less affluent, less educated parents. In other cases, poverty combines with limited economic opportunities structured by colonial legacies and the everyday oppression of perceived second-class status in one's own homeland to increase the probability of negative health outcomes.

Determinants of Health

While there has been limited focused examination of the determinants of health for Native Hawaiian infants, children and adolescents, parallels can be drawn to the similar studies done for the children of other indigenous peoples. The social determinants of health are the factors contributing to the environment to which individuals receive exposure, and in return can influence development and health over the lifespan.[36] Income has usually been recognized, along with education, as one of the two most powerful determinants of health. In examining national data, household income was negatively associated with childhood asthma, migraine and other severe headaches, and ear infections.[37] Parental mental health was also a significant negative mediator of child health, as having a family with more children. But data on the SDOH and Native Hawaiian child and adolescent health is for the most part lacking, and it may be that the lack of published research on this subject contributes to the further marginalization of this population.[38]

Racism and Colonialism

Along with social determinants of health such as poverty, educational opportunities, and housing, history may continue to affect the health status of Native Hawaiian children. Racism and colonialism can have both direct and indirect effects on health. Directly, racism and colonialism differentially structure the distribution of power, resources, and money. Indirectly, racism and colonialism contribute to chronic stress and increase allosteric load.[39,40] Racism has been demonstrated to have deleterious health effects in a number of settings: racial inequities in health in Maori self-reported health,[41,42] Aboriginal self-reported psychological and physical health,[43] African American lack of health care trust, sleep quality, and fatigue,[44,45] and Latino post traumatic stress disorder symptoms.[46]

Pathophysiology

In order to understand the development of health inequities in Native Hawaiian children and adolescents, it is important to be able to trace the often barely visible or invisible trace of their genealogies. These genealogies connect the determinants of health with individual and family health outcomes, and often become erased in a strictly biomedical model, which could be seen to constitute a colonial enterprise to naturalize health inequities as genetic or cultural. Unfortunately, much of the research to recover these genealogies has yet to be conducted, so by necessity this review depends more on work done in other communities.

Developmental Origins of Health and Disease and Epigenetics

The theory of the developmental origins of health and disease (DOHD) posits that factors influencing a fetus and child will affect later childhood and adult health. There are ten generally agreed upon principles of DOHD, from positing critical periods of development for certain tissues, to the key role of the placenta in programming to the costs of fetal compensation and a differential of programming effects in males and females.[47,48] Thus, factors such as maternal nutrition and psychosocial stress are mediated by the genome and epigenome to influence fetal programming, which in turn eventually effects the risk profile for coronary heart disease, diabetes, depression, and cancer. (Kajantie 2008) In areas such as the development of adult serious and persistent mental illness, it is the interaction of genes and environmental risk factors that can produce schizophrenia, depression, and dementia.[49] Maltreatment in childhood can produce structural and functional changes in the brain and hypothalamic-pituitary-adrenal axis.[50] Applying this theory to Native Hawaiian child and adolescent health, more research is required to both more clearly quantify the determinants that influence preconceptual, prenatal, and early child health, as well as to define the pathways between these variables and later health and/or disease.

Allostatic Load

Allostatic load is the sum total of stresses encountered over the life of an individual.[51,52] In this way, it relates to Krieger's conception of embodiment, that we carry our life's experiences, from positive to negative, as our phenotype. Biologic markers measure allostatic load, and their levels can assess the impact of acute and chronic stress. High allostatic load, in combination with genetic and environmental factors can precipitate risky behaviors such as adolescent alcohol use.[53]

Chronic Stress

Chronic stress functions to cause dysregulation through multiple pathways in development. Excessive stress can disrupt the normal development of the neuroarchitecture of the brain.[54] Another pathway is through allostatic load, where the cumulative stresses through a lifetime contribute to disease. A third pathway is through the disruption of self-regulation and coping. Here, disrupts the orderly function of the hypothalamic pituitary adrenal axis (HPA), and may cause degeneration of areas of the prefrontal cortex and hippocampus. The socioenvironmental context in which a child develops heavily influences the ability of a child to regulate her emotions, and thus to moderate the effects of the HPA. If a child grows up in a household that is not nurturing, surrounded by aggression and/or a lack of affection, their ability to self-regulate is damaged, and they develop chronically negative emotional states.[55] Thus, chronic stress may not only contribute to disease and ill health via higher allostatic load, but also disrupts areas of the brain responsible for self-regulation and coping.[56]

Together, chronic stress and allostatic load beginning prenatally or during childhood may increase the susceptibility of individuals

to disease as varied as adult onset arthritis,[57] adolescent alcohol abuse,[58] and depression and other mental illness.[59,60]

Multigenerational Trauma

The theory of multigenerational, or historical trauma posits that significant negative life events are transmitted intergenerationally and thus may continue to affect future generations decades or even centuries after the inciting event. For Native Hawaiians, some cite originating trauma as the *'ainoa*, or breaking of the traditional spiritual system in 1819.[61] It is important to note that a possible explanation for the persistence of historical trauma, in addition to the magnitude of the initiating events constituting the trauma(s), but that such events are not simply in the past. There are constant new, or similar events which may contribute to historical trauma. There are constant struggles to maintain the integrity of iwi kupuna (Native Hawaiian human remains), to preserve wahi pana (sacred sites), to recognize the equality of Hawaiian with English as an official language of the State of Hawai'i. Some Native Hawaiians may see the largely ethnic differential of political and economic achievement in Hawai'i as a reminder of a second or third class status, reinforcing historical trauma. So Native Hawaiian children and adolescents may be directly experiencing their own historical trauma, in addition to being the recipients of transmitted trauma from their families.

The impact of historical trauma may be community wide depression.[62,63] This community wide depression then manifests itself both in risky health behaviors, as well as contributing directly to pathways which increase the risk of chronic disease. The risky behaviors, whether unhealthy diets, lower levels of physical activity, unprotected sex, or substance abuse, can either directly lead to higher morbidity and mortality, or indirectly contribute to higher morbidity and mortality through increasing the risk for the future development of disease.

Resilience Factors

Although Native Hawaiian children and adolescents face a multitude of challenges to their maintenance or achievement of good health, they also have a number of resilience factors. One recent study, examining risk and resilience factors for drug use among Native Hawaiian youth emphasized that risk and resiliency factors, rather than being a dichotomy, are negotiated, and importantly that familiar and community networks (which were often overlapping or the same), could be simultaneously both risk and resiliency factors for youth drug use.[64] Thus, while acculturative stress is a risk factor for Native Hawaiian youth with high degrees of Hawaiian cultural affinity, being a member of a family with high cohesion, organization, parental bonding and support is protective. (Else 2006) Else et al (2006) posit that the dissonance between the internal cultural identity of Hawaiian males and their external identities, is a major factor in creating higher suicide risk.

Limitations of This Study

Although this study was designed to be as comprehensive as possible, it did not survey all graduate theses and dissertations, as well as unpublished work. Equally important, outside the arenas of substance abuse and depression, there is a lack of studies exploring the connections between determinants of health and Native Hawaiian child and adolescent health. Thus, this study is heavily reliant on research performed outside of Hawai'i, and on other populations. Generalizations from these studies to Native Hawaiians may be of reduced validity.

Conclusion

There are significant gaps in the data available on the health of Native Hawaiian children and adolescents. In particular, the role of social determinants of health in their health is largely lacking, as well as research identifying the pathways between the social determinants and individual health outcomes. Shifting a focus away from the individual and family to structural determinants, while difficult, changes the discourse from one of essentially blaming the victim to one that recovers the political, economic, and cultural genealogy of health and illness. As more research delinks the degree of Native Hawaiian ancestry from negative health outcomes, more focus can be brought on how the perceived and experiential role of being Native Hawaiian is articulated with health and illness. As the American Academy of Pediatrics has stated, "[h]ealth disparities in children . . . will remain all too prevalent until [SDOH] are addressed through a national agenda on child health equity — an agenda informed by the global children's rights movement…pediatrics and pediatrics must expand beyond a focus on health care and health disparities to engage the broader context of health equity."[65]

While many current programs and policies aim to address individual behaviors and risk factors, it is possible that future studies will indicate that the appropriate nexus for locating interventions in the health of Native Hawaiian children and adolescents is in the social determinants of health, particularly in addressing the pervasive influence of racism and colonialism on Native Hawaiian children and adolescents. If causation is established between these structural factors and the health of Native Hawaiian children and adolescents, structural, in coordination with individual and family level interventions will be necessitated. Thus, although it is important to continue to research dietary and physical activity interventions, the political/economic genealogy of reduced access to traditional foods and lifestyle will need to be addressed, in order to tailor policies and programs that enable community and societal level changes. These changes may address areas as diverse as land tenure, water rights, food safety, and maritime shipping policies. Similarly, given the significant role of education in shaping an ethnically hierarchical society, addressing Native Hawaiian child and adolescent health may require widescale changes to the public education system, such as increasing the numbers of Native Hawaiian educators, more equitably distributing educational resources, and changing the governance of the education system. Finally, and perhaps most importantly, if, going back to Maslow's hierarchy of needs, if self-determination for Native Hawaiians is not fully actualized, it may be that health inequities will remain significant.

The authors report no conflicts of interest.

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