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Cultural Practice and ʻĀina Connectedness as Tenants of Mauli Ola, Optimal Health and Wellbeing

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Abstract: Mauli ola, optimal health and wellbeing from a Hawaiian perspective, is achieved by being pono, or morally just and upright, and maintaining an intricate balance physically, mentally, spiritually, and emotionally through one's relations. Cultural practices, including practices that foster a connection to the water, land, ocean, and natural environment, may serve as protective and resilience factors, thereby promoting health and wellbeing. This paper starts by sharing the genealogical foundations of cultural practices in Hawaiʻi as the foundations of Native Hawaiian lifestyles and ways of knowing. The paper proceeds with data analyses that aim to better understand the role of cultural practices in relation to connectedness to ʻĀina (the land, nature, and the environment, which nourish our bodies) and Native Hawaiian health based on cross-sectional correlations and qualitative data. The findings demonstrate the importance of cultural practices, specifically ʻĀina practices, and identify ʻĀina protection, restoration, and conservation as major health priorities. The correlations demonstrate statistically significant relationships between cultural practices; a physical, mental, spiritual, and emotional connection to ʻĀina; and health outcomes. These findings continue to support literature and other declarations that support healthcare and medicine that are culturally grounded in Indigenous values and traditional systems of medicine.

Keywords: Native Hawaiian; Indigenous; culture; cultural practice; land; nature; environment; health; qualitative; survey methods

1. Introduction

Native Hawaiian perspectives of mauli ola, health and wellbeing at their fullest potential, require an intricate balance physically, mentally, and spiritually. In alignment with this worldview are the concepts of pono, living morally and righteously with oneself; kānaka (humankind); ʻĀina (the land, nature, and the environment, which feed and nourish our bodies); and akua (the spiritual realm), including one's ancestors, family guardians, and the natural elements. These worldviews of health center on relationships and connectedness, including reciprocity with the surrounding environment, with a deep understanding that the land and the abundant resources of land provide sustenance that nourishes, feeds, and protects one's body. Therefore, the health and wellbeing of the land reflects the health and

wellbeing of the community. Hawaiian ʻŌlelo Noʻeau, or proverbs and sayings, validate these ways of life, including the ʻŌlelo Noʻeau "He aliʻi ka ʻĀina; he kauwā ke kanaka. The land is a chief; man is its servant" [ʻŌlelo Noʻeau #531].

With these worldviews in mind, the first step to promote health and wellbeing and thus address health inequities among Native Hawaiians is to better understand the role of cultural practices in relation to connectedness to ʻĀina. Therefore, the purpose of this paper is to explore qualitative data and the associations between cultural practices and ʻĀina connections. A secondary purpose is to explore the relationships between cultural practices and ʻĀina connections in relation to specific biomedical health-related outcomes. To address the purpose of this study, the paper begins with the genealogical foundations of cultural practices in Hawaiʻi to set the tone for Native Hawaiian perspectives of health, lifestyles, and ways of knowing. The authors then describe the disruptions in mauli ola and Native Hawaiian practices as a result of colonization, historical trauma, and larger structural determinants of health. The paper proceeds with a description of the methods and analyses that demonstrate the importance of cultural practices, specifically ʻĀina practices, to Native Hawaiian health and wellbeing. The paper concludes with a summary of the larger implications of these findings, with recommendations for future research, practice, and policy.

This paper is written from a Native Hawaiian perspective, with all of the authors identifying as Kānaka Maoli, Kānaka ʻŌiwi, or Native Hawaiians, the Indigenous Peoples of Hawaiʻi. Each author is also engaged in various cultural practices, including cultural practices that are discussed in this manuscript, and we therefore provide our knowledge and wisdom based on our kumu (foundations, teachers, and sources), collective schools of thought, knowledge, and lived experiences in combination with various resources, as cited in the paper.

1.1. Mauli Ola, Optimal Health and Wellbeing

Native Hawaiian worldviews of health emphasize being pono and maintaining balance, which extends to our relationships. Imbalance contributes to maʻi (sickness), which could result in sickness or illness in the kino (body), maloko (within but not within the body; for instance, within the family), or mawaho (outside of the body) (Pukui et al. 1972). Traditionally, if maʻi occurred, kāhuna, experts in a specific practice and trade, would be consulted to observe and assist with treating the sickness or illness (Gutmanis 2004; Gutmanis and Williams 2013; Pukui et al. 1972). The restoration of health and mauli ola were further enhanced through spiritual practices, such as pule (prayer and spiritual connectedness), and cultural practices that promote balance and proper body maintenance. Thus, cultural practices were seen as ways of life that helped to maintain pono and balance. For instance, the practice of hāhā required knowledge and understanding of the body's functioning, while the practices of lapaʻau focused on treating an illness. Lāʻau lapaʻau, as an example, allows for treatment with the incorporation of medicinal herbs and plants. As a preventative method, ʻai pono, or healthy eating, and lāʻau lapaʻau focused on wellness through healthful consumption of foods. In cases of imbalance that resulted in maʻi mawaho or maloko, practices such as hoʻoponopono would assist in restoring balance and making things right.

Engagement with such practices required the proper protocol and spiritual grounding. Spirituality is a belief in a higher power that connects all things and relationships. The practice of spirituality was so profoundly ingrained in Native Hawaiian ways of life that Native Hawaiian kūpuna, the elders and ancestors of Native Hawaiian communities, practiced spirituality in a living, breathing, omnipresent way that required daily awareness and focus (Paglinawan et al. 2020). Spiritual entities in the Hawaiian worldview manifested within us, ʻaumākua (ancestral gods) and genealogical lineages that may be manifested through experiences or as kuleana, a deep responsibility, which was a privilege and birthright. Respectfully, when Kānaka ʻŌiwi, or Native Hawaiians, accept the power and depth of spirituality in the Hawaiian sense, these individuals also take on the obligation to learn

about the culture by affirming and understanding the critical importance of spirituality. This connection allows individuals to realize their cultural identity, truths, and kuleana, which will serve them, their families, and their community (Paglinawan et al. 2020).

Native Hawaiians view akua and ʻĀina as inextricably intertwined concepts (Kamakea-Ohelo 2022). Defining the term "akua" alludes to this concept, where akua refers to both a god or goddess (Pukui and Elbert 1986; Ulukau 2023a) but also refers to fungus in other contexts (Pukui and Elbert 1986; Ulukau 2023b). It is critical to view and acknowledge the natural environment as akua rather than as an inanimate object. One Hawaiian newspaper article, "No Ka Mahiai" (Anoilani 1865), highlights this relationship by describing the gods living in the undergrowth of a forest as Indigenous microorganisms. To care for and acknowledge these gods is to care for the resources that ʻĀina requires in order to thrive and thus to care for the health and wellbeing of kānaka.

Spirituality and overall mauli ola include spaces of wahi pana aloha ʻĀina, storied places of resistance. These spaces are place-based with stories of resistance that occur in the name of aloha ʻĀina. Aloha ʻĀina is a Hawaiian worldview and epistemological concept that perpetuates the genealogies of tradition and allows kānaka to deepen their love of awareness and connection to the land (Ioane 2022). Before modern materials, ʻĀina provided kānaka with food, tools, materials, and a way of life that allowed the people to thrive for generations (Summers 1999). The connection to ʻĀina is beyond tangibility. Kānaka ʻŌiwi placed intention in everything they did, which allowed them to connect physically, mentally, and spiritually with ʻĀina.

Presently, ʻĀina restoration and cultivation serve as a form of resistance, and thus resilience, that perpetuates cultural practices and lifestyles related to food and nourishment (Kamelamela et al. 2022). Traditional cultural practices are one form of resilience and revitalization that demonstrates the depth and importance of ʻĀina while also utilizing the ʻŌiwi methodologies of moʻokūʻauhau to guide the rediscovery of what it means to steward in an Indigenous way (Kurashima et al. 2018). Recognizing the meaning of the place we steward, our genealogical and reciprocal connections to ʻĀina, and the heavy obligation to steward and practice our cultural traditions manifests a positive bioculture that leaves a legacy for future generations and sustains our knowledge of the land, culture, and health. Purpose, reconnection, revitalization, and collective-minded resilience are fostered and nurtured when functional ʻĀina restoration, cultivation, and conservation practices are reestablished and occur properly (Graham-Tutt and Broderick 2020; Kurashima et al. 2018). Thus, the health and wellbeing of Indigenous Peoples are inextricably linked to their ancestral lands. To this end, it is critical to understand the historical and current systems of socio-ecological change Hawaiʻi has endured over the last several hundred years in order to promote Indigenous stewardship for resource management benefits that will drive collective wellbeing (Kurashima et al. 2018).

While ʻĀina is often loosely translated as nature, the land, and the environment, ʻĀina extends to include Wai (fresh water) and Moana (ocean). Similarly, just as Native Hawaiian worldviews center spirituality in cultural practice, there is also a spiritual component to the Moana (ocean), thus making the Moana essential to Native Hawaiian existence. Native Hawaiians are acknowledged as masters of ocean practices, including practices such as fishing, swimming, paddling, surfing, sailing, and long-distance voyaging (Walker 2008). Lawaiʻa were those engaged in fishing techniques and practices, who would do so for sustenance, which was maintained through practices such as the creation of ʻupena net or loko iʻa (fishponds) to gather fish, with fish being an important lean protein to traditional Native Hawaiian diets (Blaisdell in Fujita et al. 2004; Kawelo 2014). Similarly, surfing is a cultural identity that Native Hawaiians may enjoy regardless of status, age, or gender. Hawaiian ocean traditions continue today and provide Kānaka ʻŌiwi with a space of refuge that connects them to all the elements. This connection is part of who Kānaka ʻŌiwi are as Hawaiians (Walker 2008).

The intention, forethought, and intricate connections between ʻĀina and kānaka were so advanced prior to Amer-European colonization that forms of ancestral knowledge

are sustained by modern kānaka today. Knowledge continues to be retained through practices such as ʻĀina restoration, including land and watershed restoration along coastal regions and in reef zones. Other cultural practices include the continuation of stewardship in loʻi, loko iʻa, limu conservation and cultivation, other farming adaptations, personal gardening in mala, and the processes of gathering and making food. These practices and the Hawaiian language are all intentionally connected and provide Kānaka ʻŌiwi with a deeper understanding of self-cultural identity, ancestral roots, and collective legacies.

In Kānaka ʻŌiwi, or Native Hawaiian cosmology, the Kumulipo (creation chant) cites all the life forms in Moananuiākea, the vast ocean, thereby demonstrating the interconnectedness between all living things (Hoʻomanawanui 2023). Similar to other cultures and communities with oral traditions, the Kumulipo would be chanted as a way of demonstrating interconnections and to honor akua, or specific Gods and the spiritual realm. Oli, or chanting, is an oral practice that serves many functions and purposes. For instance, oli might be chanted to describe the moʻokūʻauhau or genealogy of a person, to ask for permission to enter a space, to receive knowledge and guidance while engaging in other practices, and even as a form of protection.

Other forms of ancestral knowledge are passed on through other oral practices, including mele (songs), pule (praying), and moʻolelo (storytelling). Various genres of mele have been used to record and recount histories, stories, and ideas about the lives of the people and the land. Mele is a vital part of Hawaiian cultural belief systems and practices. It is a way in which we connect to ʻĀina, traditional ways of thought, and former religion and spiritual or cultural practices. It has also been a form of expression in political theory, ideas, practice, and resistance (Basham 2008). For example, one of the most distinguished mele in the Kingdom of Hawaiʻi was written by Queen Liliʻuokalani, "He Mele Lāhui Hawaiʻi", which was composed during a time period when Hawaiʻi's engagement with colonial people and nations was increasing, making it necessary to distinguish Hawaiʻi as a lāhui, or nation (Basham 2008).

Poetry, a composition of mele, is the most appropriate language for prayers or pule. It is a vital way to address nā akua, the deities. The Hawaiian belief around language, especially for chants or prayer, is the imbued spiritual essence of mana, thus affirming and influencing how this form of language is focused and directed (Silva 1997). Ancient poets were carefully selected as individuals who were worthy of carrying on this art form and could interweave nature's intricacies, expressing knowledge, love, celebration, and truthful intention (Pukui 1949).

In Hawaiian culture, moʻolelo is another form of preserving knowledge, in which the storytelling process allows those sharing and receiving the story to learn lessons and receive deeper messages (Johnson and Beamer 2013). The word moʻolelo stems from the root word moʻo, referring to the succession of stories, legends, and traditions, as well as ʻōlelo, referring to the speaking and oral narration process. For instance, a well-known and significant moʻolelo to Kānaka ʻŌiwi is the story of Hāloanakalaukapalili, a child of Wākea and Hoʻohokukalani whose stillbirth resulted in the growth of a kalo (taro) plant that was cared for by its younger sibling, Hāloa, the first kānaka, or first person (Hoʻomanawanui 2023). This story also emphasizes our role as people and the way we are younger siblings to ʻĀina. In modern times, storytelling offers an authentic experience by allowing individuals to express, articulate, and understand lived experiences of present-day experiences and stories that have been passed down over generations (Johnson and Beamer 2013).

Moʻolelo may be expressed through hula and is immensely and innately felt by both the dancer and the audience (Osorio 2021). Hula is a traditional and sacred practice that combines art, poetry, storytelling, and dance. The stories expressed through hula celebrate gods, goddesses, ʻĀina, and highly ranked individuals in society (Emerson 1906). It is essential to acknowledge that these expressions of gods, goddesses, and people are perpetually linked to the unique ecology of Hawaiʻi. This translates to the practice of hula being a method for practicing and understanding ʻĀina (Emerson 1906). In ancient times, hula was customary for aliʻi and kānaka (Barrère et al. 1980). However, after the arrival of

Protestant, Calvinist, and Congregationalist missionaries circa 1820s, the art was deeply looked down upon and negatively scrutinized for many years (Barrère et al. 1980). As a result, countless historic dances embedded with ancestral knowledge were lost. Fortunately, the art of hula was revitalized, largely due to specific mōʻī, including King David Kalākaua, as well as the emergence of the Hawaiian Renaissance in the 1970s (Barrère et al. 1980). Today, hula serves as a treasured repository of knowledge and is at the core of perpetuating Hawaiian culture.

From a Native Hawaiian perspective, the piko is the beginning of life of an object or being. In ulana, or weaving, the piko is the center of the object. The piko builds upon the framework of understanding that weaving is more than simply plaiting or turning individual fibers into an object (Dewhurst et al. 2013). When kānaka make lei, ulana (plaits or weaves) lau hala, ulana ʻupena (fishing net), or Kōkō (knotted cordage nets), the weaver's aloha and mana are placed into action. They become spiritually alive. This allows the weaving of the relationship between teacher and student to deepen and the weaving of community to be reborn and thrive as an act of cultural genealogy. Natural materials like hala represent a collection of diverse wisdom that belongs to our kūpuna. These teachings are a gift that provide the weaver with the cultural knowledge to bring forth not just a piece of art but a breathing object (Dewhurst et al. 2013).

1.2. Disruptions in Mauli Ola and Native Hawaiian Practices

The first documented contact with non-Indigenous persons in the Hawaiian Islands occurred when James Cook arrived in 1778. At this time, the Indigenous people were noted to live "in a highly organized self-sufficient, subsistent social system based on communal land tenure with a sophisticated language, culture, and religion" (Public Law No. 103–150, 170, Stat. 1510). The arrival of Westerners subsequently resulted in population decimation through the rapid transmission of infectious and sexually transmitted diseases, with a substantial reduction in the population of more than 90%. Numerous historical, political, religious, and economic impacts systematically dismantled Indigenous resource management (Winter et al. 2023).

Rapid changes to cultural practices, Hawaiian ways of life and knowing, and overall mauli ola resulted from colonization and cultural and historical trauma. Changes in lifestyle substantially influenced the traditional and cultural practices of Hawaiʻi. In addition, these impacts shifted the agroecology and aquaculture system that supported more than one million people to a central approach built on capitalism, thus causing significant habitat loss and extinction (Winter et al. 2023). Scholars argue that these rapid changes in lifestyles and ways of knowing due to ongoing cultural and historical trauma influence the current health status of Native Hawaiians (Blaisdell 1996). Based on the historical trauma theory presented by Brave Heart and colleagues, the negative consequences of historical trauma are often transmitted intergenerationally, thereby impacting individual and subsequent generations (Brave Heart and Chase 2011). In alignment with Sotero's framework of mass trauma experiences, cultural dispossession is one of the four primary ways in which cultural and historical trauma comes about (Sotero 2006).

By 1920, Native Hawaiians were classified as a "dying people". In 1983, it was noted that neither Western medicine nor traditional Hawaiian healing practices could help to address the rapid decline in the Native Hawaiian population (Alu Like 1985). In 1985, the first comprehensive Native Hawaiian health needs study was conducted by Native Hawaiian doctors and researchers to assess the health status of Native Hawaiians (Alu Like 1985). The alarming statistics portrayed Native Hawaiians as experiencing poorer health outcomes compared to other major ethnic groups who were living in Hawaiʻi, their ancestral homeland. The health needs assessment also provided potential solutions and recommendations, including the integration of Native Hawaiian traditional practices for health and healing. This recommendation aligns with other declarations provided by the United Nations, who affirm the rights of Indigenous peoples to practice healthcare and use medicine that is culturally grounded in Indigenous values and the right to their traditional

systems of medicine, which extends to include the conservation of vital medicinal plants, animals, and minerals (U.N. 2008).

While efforts have been made to restore Native Hawaiian traditional health and healing practices, contemporary Hawaiians continue to experience adversities and inequities linked to the negative effects of colonization and ongoing historical trauma. Despite these many adversities, significant movements of resiliency have allowed for the revitalization, resurgence, and continued cultivation of Hawaiian culture and traditional health practices. Movements such as the Hawaiian Renaissance and renowned Indigenous scholars and leaders have perpetuated cultural and traditional worldviews of health and wellbeing that continue to allow Native Hawaiians to perpetuate connectedness to ʻĀina as a mechanism of health and resilience while engaging in these practices with a pono approach. Additionally, cultural practices may mediate the negative effects of the adversities and structural determinants of health that continue to impact Native Hawaiians.

1.3. Purpose of Paper

The purpose of this paper is to explore qualitative data and the associations between cultural practices, ʻĀina connections, and health-related outcomes. While we explore the associations in this paper, the authors explicitly disclose the intention to better understand the role of cultural practices as a whole and in relation to health outcomes. Thus, the authors do not explore the strength of the associations for specific cultural practices as a mechanism for recommendations or as a discussion point given the hypothesis and the inherent understanding that all cultural practices play an important role in the health and wellbeing of Native Hawaiians.

2. Materials and Methods

The data from this study are based on the Ke Ola O Ka ʻĀina (KOOKA) Project. Ke Ola O Ka ʻĀina loosely translates to the life of the land. Through this name, we honor the various ʻĀina that continue to nourish us, as people, to engage in this work as people of the land. The KOOKA Project is grounded in community knowledge and solutions, which prioritize ʻĀina and ʻĀina connectedness as a core tenant of mauli ola.

2.1. Participants

The KOOKA Research Team and Thought Partners developed throughout the duration of the project and included communities and ʻĀina who contributed deeply to this project. The KOOKA Research Team and Thought Partners include partners across the Pae ʻĀina of Hawai'i (the Archipelago of Hawai'i), including the Hoʻokena community, Hawai'i Island, Kamāwaelualani, Kaua'i Island, Maui Island, Moloka'i Island, Lāna'i Island, the Waimānalo community, and Oʻahu Island (Antonio et al. 2023). The KOOKA Research Team and Thought Partners collectively recruited participants using convenience and snowball sampling methods for the qualitative and survey methodologies. This study reports on the findings from the survey methodologies.

The participants included Native Hawaiian adults who completed the KOOKA Comprehensive Health Survey. In total, 383 adults consented to participate in the survey. Of the 383 who consented to participate, 24 were omitted from the final dataset as they did not meet the required inclusion criteria of being an adult (at least 18 years of age) or Kānaka Maoli or Native Hawaiian. An additional 18 people who met the inclusion criteria (Native Hawaiian adults) were removed due to incomplete data (i.e., the survey was not completed after the consent page). Thus, the final dataset comprised 341 Native Hawaiian adults.

2.2. Measures

2.2.1. Cultural Practices and Connection with ʻĀina

For the overall KOOKA research project, a systematic scoping review explored the existing measures of nature, the land, environmental and cultural connectedness, and their psychometric properties (Keaulana et al. 2021). Qualitative methods were then used

to identify major themes of ʻĀina connectedness in relation to Native Hawaiian health. The scoping review and qualitative methods helped to inform the development of the ʻĀina Connectedness Scale, which was co-developed with key leaders in Native Hawaiian communities, community partners, and the KOOKA Research Team and Thought Partners. The ʻĀina Connectedness Scale was then included in a comprehensive health survey, which included measures of health and health-related behaviors, including Native Hawaiian cultural practices.

The questions related to Hawaiian cultural practice included the following questions: "Do you practice Hawaiian culture?" "If you answered yes (to the previous question) please specify which practice(s)" and "In which of the following ways do you connect with ʻĀina?". This question was followed by a list of cultural practices that were most commonly identified during the qualitative methods phase which helped to inform the development of the ʻĀina Connectedness Scale and the comprehensive health survey. Lastly, the participants were asked to prioritize cultural activities and/or practices for connecting with ʻĀina for the future. In particular, participants were asked to respond to the following open-ended question: "Thinking about the future, which activities would you prioritize to connect with ʻĀina, specifically in relation to health and wellbeing?"

One of the components of the ʻĀina Connectedness Scale asked participants to report on their physical, mental, spiritual, and emotional connectedness to ʻĀina. For this study and due to non-parametric data, Spearman's Rho was calculated to determine the associations between practicing culture (Yes/No), endorsement of engaging in cultural practices to connect with ʻĀina, and physical, mental, spiritual, and emotional connectedness to ʻĀina (refer to Section 2.3. Procedures and Data Analysis).

2.2.2. Health Measures

To better understand the role of culture in relation to health outcomes, specifically from a biomedical perspective, health conditions were correlated with those who endorsed practicing Hawaiian culture and specific practices for connecting with ʻĀina. Specific health outcomes in this study included chronic health conditions, such as asthma, cancer, and diabetes, as well as depression and post-traumatic stress disorder (PTSD) or anxiety. The presence of health conditions was based on assent to the following survey item: "Have you ever been told by a doctor, nurse, or other health professional that you have any of the following health conditions?" Individuals who expressed having a health condition currently (within the last year) or previously (over one year ago) were coded as "1" and were considered to have the presence of this health condition for their lifespan (i.e., having a lifetime prevalence). Participants who responded with "no" were coded as "0", indicating an absence of the health condition.

2.2.3. Food Security

Given the importance of food during the qualitative process, food security was also explored through the United States Department of Agriculture (USDA) 6-item food security survey measure (Blumberg et al. 1999). The survey consists of 6 items, including: (1) "The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more. Was that often, sometimes, or never true for (you/your household) in the last 12 months?"; (2) "(I/we) couldn't afford to eat balanced meals. Was that often, sometimes, or never true for (you/your household) in the last 12 months?"; (3) "In the last 12 months, did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?"; (4) If the participant responded "yes" to item 3, the participant was then asked, "How often did this happen?"; (5) "In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?"; and (6) "In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?" Each item had its own categorical responses (i.e., yes or no vs. Often true, Sometimes true, and never true), which was ultimately scored as 0 or 1 in alignment with the scoring guidelines provided by the USDA.

2.3. Procedures and Data Analysis

This project utilized a community-based participatory research approach by engaging community partners, specifically from the KOOKA Research Team and Thought Partners, which include partners across the Pae ʻĀina of Hawai'i (the Hawaiian archipelago). In alignment with CBPR approaches to research, permission to engage in research and in partnership with the Waimānalo community and partnering communities and agencies was provided by the Waimānalo Pono Research Hui (Chung-Do et al. 2019; Chung-Do et al. 2022; Keaulana et al. 2019). The KOOKA research project was also approved by the university institutional review board (IRB) of the research team.

The surveys were developed and piloted between 2019 and 2020 and officially launched in 2020–2022. Piloting of the surveys consisted of two steps or phases. In the first phase, the ʻĀina Connectedness Scale and the comprehensive health survey were cognitively tested with 20 Native Hawaiian adults throughout the major islands of Hawai'i. The cognitive testing process helped to establish integrity and preliminary validity while also allowing for adaptations to the survey based on the feedback provided by those participating in the cognitive interview. Those who participated in the cognitive interview received $50 USD in the form of a gift card as a way of thanking them for their time. In the second phase, the final online survey was first administered to 10 participants as another way of establishing integrity and preliminary validity and to also ensure all items were well received. The online survey was revised and updated based on the feedback provided by the cognitive interviews and the online survey pilot and to ensure the meaningfulness of each item.

The surveys were completed anonymously through an online, secured database. Paper surveys were available upon request and mailed to/from the research team from/to the participant. To increase anonymity, proceeding with the online or paper survey after reviewing the consent form warranted consent to this study. The participants were also asked whether they were an adult (i.e., at least 18 years of age) and Native Hawaiian. Those who answered "yes" to both questions proceeded to the comprehensive survey. Those who answered "no" were thanked for their time and consideration and directed to a disqualification page.

The paper surveys were manually entered into an online, secured database. All the data were exported to Excel and analyzed using statistical software, including SPSS Statistics Version 26 and JASP 0.11.1. Frequencies and descriptive statistics were calculated for the demographic questions, items related to cultural practice, ʻĀina connectedness, and the health-related items. Correlation analyses were then conducted to identify statistically significant associations for cultural practice, ʻĀina connectedness, and health-related outcomes. Open-ended questions were coded using Excel and NVivo. Qualitative responses were analyzed using a summative content analysis approach (Hsieh and Shannon 2005). The qualitative analyses were led by the first two authors of the paper. The two lead authors reviewed the qualitative responses and created codes and salient themes based on recurring key words and synthesis of the underlying context based on the responses provided in other sections of the survey. If the coding pair disagreed, a third member of the research team was consulted to reach a consensus.

3. Results

3.1. Participant Characteristics

The final sample consisted of 341 Native Hawaiian adults. The sample primarily consisted of wāhine or female participants (n = 267, 78.3%), with a mean age of 40.6 years. The number of keiki (children) ranged from 0 to 12 children, while the number of moʻopuna (grandchildren) ranged from 0 to 26. The majority of the survey respondents were from the island of Oʻahu (n = 237, 69.5%), followed by Maui, Molokai, or Lānaʻi (n = 47, 13.8%), Hawaiʻi Island (37, 10.9%), and Kauaʻi (n = 10, 2.6%).

3.2. Qualitative Findings: Hawaiian Cultural Practices and Priorities

Of the 341 survey respondents, 268 (78.6%) endorsed practicing Hawaiian culture. Interestingly, 89.1% endorsed engaging in a listed Hawaiian cultural practice to connect with ʻĀina. Those who practiced Hawaiian culture most frequently cited ʻĀina practices. This included land stewardship and conservation, ocean practices, planting and farming practices, fishing practices, engagement in healing practices through lāʻau lapaʻau, and connecting with the land, ocean, and the natural environment. Some described ʻĀina practices in relation to food preparation, another salient theme that arose as a Hawaiian cultural practice. For instance, one participant described practicing Hawaiian culture through mea ʻai practices, including the preparation of food, gathering around food, and cooking. Kalo and fishing practices were most commonly cited as specific ʻĀina practices that promoted connection to the land and the cultivation of food.

About one-third of the participants were hula practitioners. Given the essence of hula, it was not surprising that many of the hula practitioners also endorsed engaging in cultural practices such as mele and Hawaiian music. Cultural protocols relating to oli and pule were also identified as forms of engagement with Hawaiian culture, which were often associated with ceremonial practices. Language, specifically, writing, reading, speaking, and studying ʻŌlelo Hawaiʻi, was also identified as a critical form of cultural practice as a means to preserve Hawaiian thinking and ways of knowing. In fact, in another section of the comprehensive health survey, language and education were identified as top priorities that were needed for Native Hawaiians to thrive. While not as frequent among the general survey population, several participants endorsed being cultural practitioners of hoʻoponopono and other practices that often require extensive training by a haku.

Hawaiian culture was also frequently practiced through values and ancestral concepts, specifically aloha and mālama. For instance, one of the survey respondents indicated "Implementing Hawaiian values in my life such as Kuleana, Lokahi, Malama, Aloha, and Laulima". In Hawaiian cosmologies, aloha stems from two root words including alo, meaning front face or presence, and ha, meaning breath or an exchange of breath. Therefore, aloha embraces the breath of life and specifically the exchange of breath that comes with the essence of exchanging our divine energy and power, as well as our deep love, gratitude, and affection. Similarly, mālama loosely translates to caring, preserving, protecting, and maintaining. Recently, radical forms of aloha have been acknowledged through our continued deep connection with ʻĀina and honua as Mother Earth. When the respondents reported on practicing Hawaiian culture through mālama, the participants most frequently cited caring for ʻĀina (i.e., mālama ʻĀina) as their primary practice of Hawaiian culture, followed by caring for each other (i.e., "malama kekahi i kekahi", which loosely translates as taking care of one another).

Many of these practices were described as intergenerational practices. For instance, one of the participants described "Speaking Hawaiian and preserving language by speaking with future generations". In fact, many of the participants often cited the importance of learning these practices from kumu as being important, while also teaching their children and grandchildren cultural practices. Similarly, values were often described as being interconnected to other values and concepts such as kuleana (deep responsibility) and respect. For example, one of the participants described the importance of "teaching our moʻopuna (grandchildren) the value of listening and respecting their elders".

The participants as a whole, whether or not they endorsed engaging in Native Hawaiian cultural practices, were asked to rank cultural activities or practices for the future and for connecting with ʻĀina. The first priority included ʻĀina protection, restoration, and conservation. This extended to include water and land preservation, the restoration of lāʻau lapaʻau practices, māla conservation, the cultivation of kalo, and the restoration of loʻi kalo, as well as ocean activities, including limu planting, loko iʻa restoration, and waʻa practices. For instance, one of the participants cited the importance of prioritizing "māla and anything ocean", while another identified "anything connected to the sea" as the primary priority. Similarly, the participants identified the importance of ʻĀina activities

that incorporated growing and preparing food and thus food practices as a family and community. In particular, "sustainability, growing own foods" was identified as a priority, demonstrating the importance of "food sustainability and sovereignty on the ʻĀina, in the wai/kai (water/ocean and sea) and ala wai (freshway water)". This priority was further endorsed by specific examples such as a "community-based subsistence fishing area", "making food, growing food, eating food, food forests, and growing food for our food!", and "preserving and conserving spaces for traditional farming and growing native Hawaiian plants."

In addition to these ʻĀina priorities, spiritual connections through pule and cultural protocols were also identified as a priority. The practices were specifically identified as facets of building pilina, which are traditional and customary practices. As such, pule and protocols that embed oli and mele lay the foundation for protocols and etiquette while also perpetuating knowledge. These practices were further enhanced through other practices, such as hula and language. Storytelling, especially through elders, were also identified as a priority in perpetuating Native Hawaiian practices, epistemologies, and ontologies.

3.3. Correlational Findings of Cultural Practice, ʻĀina Connections, and Health Outcomes

To better understand the associations between cultural practice, ʻĀina connections, and health outcomes, general correlations were generated between the engagement in cultural practice and endorsement of engaging in specific cultural practices to connect with ʻĀina. Overall, 89.4% of the participants reported being physically, mentally, spiritually, and/or emotionally connected to ʻĀina (Refer to Table 1). In general, those who reported engaging in more cultural practices (i.e., the sum of all the listed cultural practices) to connect with ʻĀina were more likely to report practicing Hawaiian culture, with a Spearman's correlation of 0.59 ($r(339 = 0.59$, $p < 0.01$).

Based on the Spearman's rank correlations, those who endorsed practicing Native Hawaiian culture demonstrated a positive and statistically significant relationship with all forms of connection with ʻĀina, including physical connection ($r(339 = 0.34$, $p < 0.01$), mental connection ($r(339 = 0.33$, $p < 0.01$), spiritual connection ($r(339 = 0.29$, $p < 0.01$), and emotional connection ($r(339 = 0.32$, $p < 0.01$). The Spearman's rank correlations ranged from 0.18 to 0.51 between cultural activities and/or practices and a physical connection to ʻĀina, 0.17 to 0.43 between cultural activities and/or practices and a mental connection to ʻĀina, 0.24 to 0.40 between cultural activities and/or practices and a spiritual connection to ʻĀina, and 0.26 to 0.41 between cultural activities and/or practices and an emotional connection to ʻĀina. Engagement in any cultural practice to connect with ʻĀina had a stronger correlation coefficient when exploring the relationship between cultural practice and connection with ʻĀina. For instance, participation in any of the listed cultural practices to connect with ʻĀina had a moderate and statistically significant relationship with a physical connection to ʻĀina ($r(339 = 0.51$, $p < 0.01$), a mental connection to ʻĀina ($r(339 = 0.41$, $p < 0.01$), a spiritual connection to ʻĀina ($r(339 = 0.42$, $p < 0.01$), and an emotional connection to ʻĀina ($r(339 = 0.43$, $p < 0.01$).

The lifetime prevalence of health conditions for the survey respondents varied, with a lifetime prevalence of asthma of 29.3%, a lifetime prevalence of cancer of 4.7%, a lifetime prevalence of diabetes of 11.1%, a lifetime prevalence of depression of 26.1%, and a lifetime prevalence of PTSD or another anxiety disorder of 22.3% (see Table 1). Despite the weak associations, the Spearman's rank correlations demonstrated negative and statistically significant correlations between engagement in any cultural practice to connect with ʻĀina and a lifetime prevalence of diabetes ($r(339 = -0.12$, $p < 0.01$), depression ($r(339 = -0.12$, $p < 0.01$), or PTSD or an anxiety disorder ($r(339 = -0.13$, $p < 0.01$). In other words, while the correlations are weak, engagement in cultural practices demonstrated decreased prevalence of the reported health condition. Similarly, specific cultural practices, such as hula and advocacy, demonstrated a weak yet negative and statistically significant relationship with the mental health indices, such as depression, with the correlation coefficients ranging from

−0.13 to −0.16, and PTSD or an anxiety disorder, with the correlation coefficients ranging from −0.13 to −0.22, as well as diabetes, with a correlation coefficient of −0.12.

Table 1. Participant characteristics.

Participant Characteristics	Mean (SD) or Values *n* (%)
Gender	
Wāhine or female	267 (78.3%)
Kāne or male	72 (21.1%)
Other	2 (0.6%)
Age	40.60 (14.87)
Number	
Number of keiki (children)	1.70 (1.93)
Number of keiki (children) in household	1.21 (1.57)
Number of moʻopuna (grandchildren)	1 (3.15)
Island	
Oʻahu Island	237 (69.5%)
Maui, Molokai, or Lānaʻi	47 (13.8%)
Hawaiʻi Island	37 (10.9%)
Kauaʻi Island	10 (2.6%)
Other	10 (2.6%)
Practices Hawaiian Culture	
Yes	268 (78.6%)
No	73 (21.4%)
Connection to ʻĀina through Cultural Activity and/or Practice *	
Engagement in any cultural activity to connect with ʻĀina	304 (89.1%)
Ocean activities	260 (76.2%)
By preparing or making food	255 (74.8%)
Mele (songs) or oli (chanting)	211 (61.9%)
Moʻolelo or storytelling and/or talking story	210 (61.6%)
Through pule and spirituality	195 (57.2%)
Through advocacy and protection of ʻĀina	184 (54.0%)
Mala or gardens	180 (52.8%)
ʻĀina restoration	163 (47.8%)
Loʻi kalo or taro patches and/or farming practices	147 (43.1%)
Hula	142 (41.6%)
By building or making things	123 (36.1%)
Connection to ʻĀina	
Physically, mentally, spiritually, and/or emotionally	305 (89.4%)
Physically	264 (77.4%)
Mentally	246 (72.1%)
Spiritually	248 (72.7%)
Emotionally	249 (73.0%)
Lifetime Prevalence of Health Conditions	
Asthma	100 (29.3%)
Cancer	16 (4.7%)
Diabetes	38 (11.1%)
Depression	89 (26.1%)
Post-traumatic stress disorder (PTSD) or other anxiety disorder	76 (22.3%)
Food Security	
High food security	181 (53.1%)
Low food security	101 (29.6%)
Very low food security	59 (17.3%)

* In the table above, the tenets of Connection to ʻĀina through Cultural Activity and/or Practice are listed in descending order based on frequency.

Food security was a salient qualitative theme, which was further validated by the elevated food insecurity levels among the participants of the survey. Approximately 53.1% of the participants experienced high food security, 29.6% experienced low food security, and 17.3% experienced very low food security (see Table 1). Similar to the biomedical health conditions, the Spearman's rank correlations demonstrated negative and statistically significant correlations between engagement in any cultural practice to connect with ʻĀina and food insecurity ((r(339 = −0.26, $p < 0.01$), thereby indicating that cultural practices were more positively correlated with food security. In particular, ocean practices, mele and oli, and the preparation of food demonstrated a weak yet negative and statistically significant relationship with food insecurity, with the correlation coefficients ranging from −0.13 to −0.22.

4. Discussion

Native Hawaiians, and Indigenous Peoples globally, continue to endure the negative effects that result from colonization and historical trauma, including ongoing cultural and intergenerational trauma, which contribute to the health inequities experienced by contemporary Native Hawaiians and Indigenous Peoples. Culture and cultural practices, specifically cultural practices that enhance a connection to ʻĀina, may help to mitigate these negative effects of historical trauma by serving as a protective factor, as demonstrated by the positive and statistically significant correlations between culture, cultural practice, and connection to ʻĀina. For instance, the findings from this study align with the other literature, which describes the importance of cultural strengths and traditional Indigenous practices as a mechanism of resiliency for Indigenous Peoples by restoring and revitalizing cultural practices to enhance the wellbeing of Indigenous Peoples (Goodkind et al. 2010; Ramirez and Hammack 2014). Integrating culture and cultural practices into everyday activities and lifestyles, including an integration of culture and ʻĀina wellbeing into healthcare systems, may promote overall health and wellness. These findings were further validated through qualitative findings that demonstrated the importance of cultural practices, which foster ʻĀina connections, ʻĀina protection, restoration, and conservation as major health priorities.

Although the analyses demonstrated weak correlation coefficients with biomedical health outcomes, their statistical significance demonstrates their potential to mediate or moderate biomedical health outcomes through cultural practice and ʻĀina connections, with implications for future research, practice, and policy. These weak correlations could also be attributed to the impacts of COVID-19, the time period in which the survey was administered. For instance, it is possible that a larger proportion of the sample indicated a greater lifetime prevalence of depression and PTSD due to the impact of COVID, which exacerbated existing health disparities. By the same token, it is possible that individuals did not indicate practicing Hawaiian cultural practices that fostered connections to ʻĀina at the time of the survey due to the constraints that were further intensified by COVID-19. On the other hand, it is possible that cultural practices and ʻĀina connections foster mauli ola, the health and wellbeing of Native Hawaiians from a Hawaiian worldview, which is not captured within the biomedical definitions of health. Therefore, an exploration of cultural strengths, cultural practice, and ʻĀina connections should further be explored using measures of health and wellbeing from a Native Hawaiian worldview.

For instance, the current study examined health outcomes as the presence or absence of a health disease, which starkly contrasts with Native Hawaiian worldviews of health, which emphasize the balance of physical, mental, spiritual, and emotional health, which further extends to include our relations with other people, other living things, the land, nature, the environment, and our spiritual connections. Thus, it is possible that engagement in cultural practices and connection to ʻĀina were weakly associated with biomedical health outcomes due to the fostering of health from a Native Hawaiian perspective. Therefore, future research, practice, and policies should continue to explore the way cultural practice and ʻĀina connections may foster health from a Hawaiian worldview while concurrently exploring the way these factors mediate health disparities, specifically mental health

concerns and chronic health conditions, as demonstrated by the weak yet statistically significant correlations between engagement in cultural practice to connect with ʻĀina and specific health outcomes.

Along these lines, the quantitative and qualitative findings of the survey demonstrate the importance of cultural practices that foster ʻĀina connections in relation to food, food security, and food sovereignty. In particular, growing and preparing food and thus food practices as a family and community may help to alleviate health-related disparities related to food insecurity, as demonstrated by the concerning levels of low food security and very low food security, with about half of the sample experiencing food insecurity. This was further supported by priorities that demonstrated the importance of food sustainability and sovereignty at large to the land, water, and other precious resources that are necessary for communities to survive and thrive.

At the practical and clinical levels, applications of cultural humility may be key to promoting awareness of and education about the importance of cultural practice and ʻĀina connectedness. Cultural humility may also be fostered through training about Hawaiian history and the essence of Hawaiian culture to minimize appropriation due to the commodification of culture and values that has resulted from colonization. An emphasis on cultural humility and ʻĀina connectedness may also adhere to the ongoing evolution of culture. For instance, culture is not stagnant but is rather ever-changing based on the shared beliefs, attitudes, values, goals, and practices of a social group, and therefore an intersection of cultural characteristics is also important to consider when integrating culture and cultural practices into daily activities and larger systems, including healthcare and educational systems.

On the other hand, Hawaiian cultural practices and ʻĀina connectedness in Hawaiʻi, the ancestral homeland of Native Hawaiians, should be more normalized, with increased efforts and resources to enhance access to and the availability of these cultural practices. Prioritizing Native Hawaiian culture and cultural practices may promote wellbeing by mitigating the negative effects of cultural and historical trauma while also inherently promoting ea, which has been defined as self-determination and agency in other wellbeing frameworks. In alignment with Kūkulu Kumuhana, ea (self-determination) will ultimately support other dimensions of wellbeing, including pilina (mutually sustaining relationships), waiwai (ancestral knowledge and collective wealth), ʻĀina momona (healthy and productive land and people), ʻōiwi (cultural identity and native intelligence), and ke akua mana (spirituality and the sacredness of mana) (Office of Hawaiian Affairs Staff 2020). Support for culture and cultural practices adheres to the legal and social responsibility of the United States to provide federal support that ensures Native Hawaiian health needs are being met. This also aligns with articles from the United Nations, which declare the right of Indigenous Peoples to their traditional systems of medicine and health practices, which extends to include the conservation of vital medicinal plants, animals, and minerals (U.N. 2008).

This study is not without its limitations. As with any cross-sectional study, the findings of this study are limited to one point in time. Furthermore, the cross-sectional nature of the data does not allow causal statements or an analysis of data trends over time. Similarly, the findings of this study may not necessarily be generalizable, including the limits of generalizability to other Native Hawaiian individuals and communities. On the other hand, the strengths of this study highlight the importance of administering, implementing, and analyzing data with, for, and by Native Hawaiian communities. In this case, the prioritization of culture and ʻĀina connectedness will help to reframe the narrative of health by (re)centering aspects of health and wellbeing from a Native Hawaiian worldview.

5. Patents

The Ke Ola O Ka ʻĀina ʻĀina Connectedness Scale belongs to the Ke Ola O Ka ʻĀina Research Team and Thought Partners.

Author Contributions: Conceptualization and methodology, M.C.K.A., K.F., S.K., S.K.F., M.T.-L., J.L.I., K.L.M., J.K.V., L.K. and H.I.H.-L.; software and validation, M.C.K.A., K.F. and S.K.; formal analysis, M.C.K.A., K.F. and S.K.; writing—original draft preparation, review and editing, M.C.K.A., K.F., S.K., S.K.F., M.T.-L., J.L.I., K.L.M., J.K.V., L.K. and H.I.H.-L.; naming of the project, J.K.V.; funding acquisition, M.C.K.A., S.K., L.K., Ke Ola O Ka ʻĀina Research Team and Thought Partners and H.I.H.-L. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The study was conducted in accordance with the Waimānalo Pono Research Hui and the Institutional Review Board of the University of Hawai'i at Mānoa (2021-00067 approved on 30 March 2021 and 2021-00751 approved on 28 October 2021).

Informed Consent Statement: Informed consent was obtained from all the subjects involved in the study. Given the anonymous nature of the survey, proceeding to the first page of the survey implied consent to participate in the study.

Data Availability Statement: The data that are shared in this research study belong to the various communities, organizations, and individuals who are represented in this paper.

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