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"We Live in a Very Toxic World": Changing Environmental Landscapes and Indigenous Food Sovereignty

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ABSTRACT *The purpose of this article is to understand how historical oppression has undermined health through environmental injustices that have given rise to food insecurity. Specifically, the article examines ways in which settler colonialism has transformed and contaminated the land itself, impacting the availability and quality of food and the overall health of Indigenous peoples. Food security and environmental justice for Gulf Coast, state-recognized tribes has been infrequently explored. These tribes lack federal recognition and have limited access to recourse and supplemental resources as a result. This research fills an important gap in the literature through exploring the intersection of environmental justice and food insecurity issues for this population. Partnering with a community-advisory board and using a qualitative descriptive methodology, 31 Gulf Coast Indigenous women participated in semi-structured interviews about their healthcare experiences and concerns. Through these interviews, participants expressed concerns about (a) the environmental impacts of pollution on the contamination of food and on the health of tribal members; and (b) the impact of these changes on the land, such as negatively impacting gardening practices. The authors of this study document how environmental changes have compounded these concerns and contribute to the overall pollution of food and water sources and unviability of subsistence practices, severely effecting tribal members' health. In conclusion, we show how social and environmental justice issues such as pollution, industry exploitation, and climate change perpetuate the goals of settler colonialism through undermining cultural practices and the overall health of Indigenous peoples.*

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Environmental injustice is a contemporary form of historical oppression (Burnette & Figley, 2017; Burnette et al., 2018) that is increasingly being explored in relation to Indigenous sovereignty and health disparities (Hoover et al., 2012; Singer, 2018; Tsosie, 2007; Vinyeta et al., 2016). Historical oppression of Indigenous peoples has occurred across time through land dispossession via coercive treaties and forced relocation, and as a result of settler colonialism. It continues today through chronic, pervasive, and intergenerational forms of environmental injustices, which have disrupted cultural continuity, diet and well-being (Burnette & Figley, 2017; Burnette et al., 2018). The environmental justice framework provides activists and scholars a way of conceptualizing how social justice issues, and historical and contemporary forms of oppression intersect with environmental issues such as land use, pollution and resource extraction.

Indigenous peoples experience disproportionate rates of acute and chronic health conditions, which are often linked to diet, and are an important social justice concern (Blue Bird Jernigan et al., 2012, 2013, 2017; Milburn, 2004; Sowerwine et al., 2019). Food security is the availability, access, and ability to procure safe and nutritious foods that are aligned with the food preferences of groups and consistent with their social and cultural customs and values (Pinstrup-Andersen, 2009). Despite the pronounced impact that climate change and other environmental justice issues have on food production and the contamination of local resources (Adamson, 2011; Smith Ahern, 2020), the intersections between environmental justice, social justice, overall health and food security have been underexplored.

Food security and environmental justice have also been understudied for state-recognized Indigenous peoples who experience additional obstacles posed by a lack of federal recognition and the associated impairment in controlling and regulating their land and resources (Crepelle, 2018; Fletcher, 2006). This is an important social justice issue facing members of the tribe in this study. Tribes located in the Gulf Coast experience environmental injustices, climate change, and land loss at accelerated rates due to both the impacts of climate change (e.g., rising sea levels) and industrial exploitation (e.g., oil company activities which weaken the land and accelerate wetland loss) (Austin, 2006; Maldonado, 2014). It is important to note that while the particular environmental injustices experienced by Indigenous peoples are place-specific, parallel environmental injustices related to industry exploitation (e.g., oil extraction in Standing Rock, Peru, and Ecuador (Gilio-Whitaker, 2019; Sawyer, 2004)) and the impacts of climate change (e.g., warming oceans and rising sea levels in Alaska (Ahtuangaruak, 2015)) are extensively documented among Indigenous peoples throughout the US and across the world (Hoover, 2017).

This research fills a gap in the exploration of the interrelationships between health, environmental justice, social justice, and foodways for state recognized Indigenous peoples who are impacted by colonization and place in distinctive ways. It is important to explore state recognized tribes specifically, as these tribes have not only undergone historical oppression related to colonization, but also continue to experience restrictions in acknowledgements and resources due to a lack of federal recognition. This research contributes to greater understanding about the connection between environmental justice issues, health and food security for Indigenous peoples, necessary to develop targeted interventions and policies promoting the sovereignty and well-being of Indigenous peoples.

The purpose of this article is to explore the intersection of environmental injustice, social justice, health and food security among women from a state-recognized Indigenous tribe in the Gulf Coast of the United States. The overarching research question is: "How has historical oppression undermined the health of Indigenous peoples through environmental injustices and food insecurity?" We situate these experiences to show how settler colonialism, which began with the forced removal and genocide of Indigenous peoples, is an ongoing process; it continues in the present through the exploitation of Indigenous resources by industry and land loss related to climate change, industrial exploitation, and the precarious geographical location of the tribe resulting from forced tribal relocation (Burnette & Figley, 2017; Glenn, 2015; Hixson, 2013; Wolfe, 1999).

Settler Colonialism, Food Security, and Indigenous Peoples

Many of the contemporary and historic injustices experienced by Indigenous communities can be linked to the history of settler colonialism, which has included genocide and the forcible removal of Indigenous peoples from their ancestral land. Settler colonialism is a component of historical oppression (Burnette & Figley, 2017); far from being viewed as a discrete, historical event, it can instead be understood as an ongoing process (Burnette & Figley, 2017; Glenn, 2015; Hixson, 2013; Wolfe, 1999). As such, the extensive and concomitant health disparities experienced by Indigenous peoples are not exceptional occurrences but are, in fact, consistent with the settler colonial project.

Forms of historical oppression experienced by tribes in this region include both past and contemporary social and environmental injustices, from being forcibly removed from ancestral land onto less desirable land to frequently experiencing exploitation by industries (Ahtuangaruak, 2015; Burnette et al., 2019; Billiot, 2017; Billiot & Parfait, 2019; Burnette et al., 2018; Crepelle, 2018; Gilio-Whitaker, 2019; Hoover, 2017; Liddell & Kington, 2021; Liddell et al., 2021; Sawyer, 2004). Moreover, it is well documented that Indigenous peoples are exposed to high levels of pollution in the air, water

and land (Thompson & Kwok, 2004). While pollutants are context specific, they have important implications for food security as pollution can render food unsafe and unusable (Hoover, 2017; Rotkin-Ellman et al., 2012). This article examines how environmental and social injustices such as these affect sovereignty and enculturation of Indigenous peoples by negatively impacting food security. The continuation of environmental injustices and resulting food insecurity is an extension of settler colonial goals, in which Indigenous peoples' control over land and resources is impeded.

Tribal Setting and Context

The focal tribe resides on the Gulf Coast, and lives throughout a large geographic region that is home to bayous, wetlands, and river systems (Austin, 2006; Lambeth, 2016; Maldonado, 2014). This setting contributes to the economic, cultural, physical and mental well-being of the tribe in a variety of ways, including through the provision of food (Austin, 2006; Crepelle, 2018; Lambeth, 2016; Maldonado, 2014). Activities such as gardening, raising livestock and especially fishing provide both nutritional sustenance and important cultural activities for the tribe (Burnette et al., 2018).

The focal tribe experiences oil and gas industry exploitation (Crepelle, 2018; Sawyer, 2004), as well as issues of land loss. Climate change has caused rising sea levels, and more severe and more frequent hurricanes, both of which exacerbate coastal erosion (Austin, 2006) and increased flooding (Lambeth, 2016; Tully et al., 2019). Oil company infrastructure and activities, such as the dredging of canals, is prevalent in the region, and exacerbates these issues by weakening the land and leading to increased loss of wetlands, which are a natural buffer against flooding and storm surges (Austin, 2006; Tully et al., 2019). Indigenous peoples in this region are adversely affected by oil rigs due to pollution, oil spills and this dredging of canals, but are also often employed by the oil industry, making them dependent on these corporations for their livelihood. This simultaneous oppression and reliance on the oppressor – due to their greater wealth, power and status – is a characteristic challenge of historical oppression (Burnette & Figley, 2017).

While the effects of climate change and industrial activities on land loss, flooding and hurricanes is widely acknowledged, the issue of saltwater intrusion receives less attention, perhaps because it is not as visible (Tully et al., 2019). Saltwater intrusion can have a variety of causes and sets off a cascade of dramatic biogeochemical and environmental changes. The coastal region this Indigenous group resides on experiences some of the primary causes of rapid saltwater intrusion, including sea level rises, storms and tides which push seawater inland, and increased water connectivity due to oil canals and levees (Tully et al., 2019). Saltwater has around 400 times more

salt than freshwater, and this dramatic change of ionic concentration causes significant osmotic stress to organisms not adapted to saltwater; very few plants can grow successfully in saltwater (Tully et al., 2019).

The Gulf Coast region also experienced the impacts from the historic and catastrophic 2010 BP oil spill, which dumped more than 4.9 million barrels of oil into the Gulf of Mexico, causing rapid contamination of the environment, including the contamination of previously relied upon food sources. This devastating event led to negative mental and physical health outcomes, as well as decreased employment and negative economic impacts for those in the region (Cope et al., 2013; Patel et al., 2018). The impacts felt by this Indigenous group resulting from disasters such as this, climate change and petroleum activities is especially injurious considering the history of forced tribal relocation to this area (Fitzgerald, 2015).

Although this Indigenous tribe has been well-documented in the region and is recognized by the state, they have been unable to gain federal recognition, a process that is highly political with little standardization in enforcement (Fletcher, 2006). Without federal recognition, tribes are unable to receive benefits and resources afforded to them under federal treaty agreements which impedes their ability to receive resources following disasters (U.S. Commission on Civil Rights, 2004). Additionally, without federal recognition, tribes are unable to exercise authority over the use of the land on which they reside, including the preservation of sacred sites, and cannot enact environmental regulations as they desire, an important social justice issue (Burnette et al., 2019; Liddell et al., 2021; Maldonado, 2014). A lack of federal recognition has also helped to facilitate environmental exploitation in the region by petroleum industries, and allowed BP to deny them resources following the oil spill since they only recognize claims from federally-recognized tribes (Crepelle, 2018; Liddell et al., 2021).

Occupational options for the tribe have been limited due to the history of educational discrimination, and the most common employers among the tribal members are the fishing and oil industries; this complicates the relationship many members have with oil companies (Crepelle, 2018; Maldonado, 2014). While previously many tribal members relied on Indigenous healers for healthcare, this trend has been decreasing, potentially as a result of the changing landscape and the negative impact it has had on plants and medicines used in healing (Bates, 2016; Maldonado, 2014; Vinyeta et al., 2016). This is an example of the multiple pathways through which the changing environment is impacting Indigenous health and well-being.

Methods

Research Design

Data was drawn from a larger qualitative descriptive study that took a holistic ecosystemic, life course, and resilience informed approach to investigate the reproductive and sexual health experiences of women from an Indigenous Gulf Coast tribe (Liddell, 2020; Liddell & Kington, 2021; Liddell & McKinley, 2021; Liddell & Doria, 2022; Liddell & Lilly, 2022). Although the broader study focused on women's health, given that health, resilience and land are inseparable among many Indigenous communities (Kirmayer et al., 2009), environmental concerns came up emergently and frequently, warranting their own attention. This qualitative study centered the historical and social context for the focal tribe and deferred to participants' voices, following their lead throughout the interview process. As such, many themes related to the environment, land, gardening and health emerged organically; these are the focus of this article. Qualitative descriptive methodology has been frequently used and recommended for research with Indigenous peoples (Burnette et al., 2014; McKinley et al., 2019). The straightforward interpretation of findings elevates the real experiences of participants as portrayed by their own words, enabling a more accurate understanding and working to limit bias (Denzin et al., 2008).

The project utilized a community engaged research approach designed in collaboration with a community advisory board (CAB) made up of tribal members. The principal investigator (PI) was invited to do this project by one of the CAB members based on the PI's previous engagement with the tribe. The study protocol and interview guide were designed with CAB members, as were discussions about study findings and potential uses of research findings. The CAB and the Tribal Council approved the study and offered feedback on the research study during each step of the research process. In addition, the steps outlined in Burnette et al.'s (2014) "Toolkit of Strategies for Culturally Sensitive and Ethical Research with AI/AN Communities" were followed throughout. The qualitative descriptive methodology utilized semi-structured, in depth, qualitative interviews and conventional qualitative content analysis, the analysis of choice for qualitative descriptive studies.

Setting and Participants

The first author conducted interviews with 31 women from a state-recognized Indigenous tribe located on the Gulf Coast. The tribe's identity remains anonymous due to agreements with the tribal council, who requested their name not be included. This is congruent with best practices in conducting research with Indigenous peoples and is related to previous

negative experiences other Indigenous peoples have had with researcher exploitation (Burnette et al., 2014). To qualify for the study, participants needed to be 18 years or older and self-identify as a woman and a member of the tribe. Participants' ages ranged from 18 to 71, with a median age of 51.17. Most participants (83.4%) had at least one child, and those with children had an average of two or three children.

Data Collection & Analysis

Institutional Review Board (IRB) approval was granted from both Tulane University, and the tribal council. Recruitment flyers were posted at tribal and community centers, and purposeful snowball sampling was assisted by the community advisory board. A semi-structured interview guide was used, informed by responsive interviewing (Rubin & Rubin, 2011), and questions followed the life trajectory to gain overtones of a life course approach (Sandelowski, 2000). A life course approach was used to identify generational changes in health experiences, to understand life experiences with the context in mind, and to explore differences in perceptions about health issues. Participants were asked a range of questions about their health experiences, including questions related to health barriers and supports in the tribe. Here we focus on responses related to food and diet brought up by participants. See Liddell & Kington (2021) for the full interview guide. Interviews were conducted from October 2018 to February 2019, and ranged from 30-90 minutes in length, with an average interview lasting 66 minutes. Participants were offered a $30 gift card to compensate them for their time. Interviews were recorded with participant permission, transcribed via a professional transcription service, then checked by the PI to make sure they had been transcribed verbatim. Data were analyzed with NVivo software using conventional content analysis. This approach began with open coding to identify broad themes, followed by direct coding to identify subthemes (Milne & Oberle, 2005). All but three participants were provided a summary of all research findings (two were unable to be reached, and one declined to participate) through member checking. Participants were supportive of findings and did not request that any changes be made. A summary of findings was also presented at a tribal council meeting and was approved by the tribal council. In the following quotes, interviewees are given anonymous identifiers to show how themes were represented across participants.

Results

The importance of food in family and community traditions was a recurrent theme among women. Nineteen of 31 women described concerns related to

food and diet when asked about community health barriers. Food was often described as an important reason for social gatherings. However, many women also mentioned concerns they had about food, including the themes of *"food contamination"* and *"barriers to gardening."* Women made explicit connections with changes they saw occurring in the environment and the themes of contamination of food and changes in the ability to garden.

"We Live in a Very Toxic World," and "The Food Doesn't Taste the Same": Food Contamination

Participants described their concerns that environmental changes were negatively impacting the health of the community by polluting the food people have access to. Participant 6 described concerns that the food people ate was being poisoned by toxins in the environment, noting that many of her family members died of cancer following the B.P. Oil Spill:

> All at the same time we lost them one after the other. And this is all after B.P. and my dad worked for them…that had a lot to do with it. So I think it might have been the seafood or something…I know after B.P. that's when they [relatives] started falling like flies…You can tell it's not…good stuff…. Now, it stinks when you're out there [on the water]. Very nasty. I think that's got a lot to do with the people getting sick too...I guess the old people, they lived longer because they didn't have all this nonsense they have now because back, long time ago, the people used to live longer than they live now.

This participant felt that tribal members used to live longer before the environmental contaminants introduced by the B.P. Oil Spill. Participant 20 also described how tribal members used to live to old ages:

> My grandma was [a] 100 when she died. My great grandma was 96 when she died. Yeah. Or 97. She was, way up there, right… but nowadays…Their diet is, I mean it's, it's seafood… Whatever they can go out and catch… So I'm sure there's a link.

This woman felt that the decrease in life expectancy could be directly tied to changes in diet, and especially to contamination of seafood. Participant 4 further highlighted how pollution in the water not only undermined tribal members' ability to consume seafood from the water, but also the ability of tribal members to financially survive:

> Because now there's no shrimp. You can't make a living off of shrimp no more… There's no shrimp nowhere…Even the crabs are not like when they used to be... [Because of] pollution in the water.

Another participant (11) also described her concerns that the oil spill had caused there to be contaminants in the seafood:

> It's [that the oil spill is causing health problems] being kind of discredited because people are self-reporting… like… people say they have symptoms from like exposure from the cleanup, the dispersants… They're like [government agency], "no, it's not bad. It's totally fine." But it's [contaminants] like killing animals and stuff. Like I don't think it's totally fine. And not to mention all it does is make the oil sink. So that's going to reemerge, and you know when it's going to reemerge is when there's a hurricane, like another bad hurricane that kind of stirs all that up… that was one of the things we've kind of talked about hoping that we can maybe do is come up with some type of way to test seafood for these hazards because so many people, especially like tribal communities rely on the seafood.

This participant also noted that tribal knowledge was often being discredited; despite tribal members' noting the changes to the seafood and the environment, government agencies often dismissed this type of experiential knowledge and data. This participant went on to state:

> So, if you can't put money to it, it's just like, might as well not exist. And it's just like, well no, you [outsiders] don't understand. Like these people eat shrimp like three or four nights a week and now they're having to go to the store…because people didn't eat seafood for a while [following the B. P. Oil Spill]. Like they said, they were pulling up crabs, crabs where like the gills were black.

Women also expressed that it was getting harder to find high-quality seafood, and noted concerns about possible toxins. Participant 1 reported feeling like there were more toxins in the food:

> I believe it's our diet that has caused the cancer, you know, and then all of the preservative[s] and all the fast foods…because that's not healthy… it's either chemical, all these things, it's made out of a lab or do you take a chance and eat the chemicals from the water? Yeah, it's kind of give or take. What else do you do? The cancer rate over here is so alarming down here. It is very alarming.

This participant felt that there was a risk for tribal members in eating food from the environment, while also describing feeling that the increase in fast food and processed foods was dangerous for the health of tribal members as well.

Reduction in the ability to live off food from the environment meant that tribal members had to rely more on fast food and processed food. Participant 11 described the increase in processed food, in addition to discussing her concerns about the lack of regulation of food and its impact on health:

> We live in a very toxic world from everything that we touch and put in our bodies and breathe and drink and expose ourselves to… we live in a very contaminated world, especially with the food, processed food … I think it's getting worse… the EPA and the food administration and all these other

> organizations that control all of these things, the more, lax, they get on regulations… the more spikes that we're going to see because… you don't see it until it's too late… we don't see what we're putting in our bodies and I'm guilty- I mean, I just ate a hamburger from Wendy's… I'm in a lot of circles where I know… that eating processed meat is one of the worst things that you can do because the high rate of chemicals that are feed to these cows that are pumped with hormones, that are put into a facility that's not completely… like the whole trail from grass to cow to facility to manufacturer, to plastic company to the supermarket…. we poison ourselves every day, with everything that we do… there's not enough… water containers and… antibiotics soap that's gonna stop it.

This participant connected eating more processed food with existing health issues. Participant 12 noted that food tasted different than when she was growing up:

> I feel like the food that you get from nature, that you get in the wild, don't taste the same when I was growing up…. The food doesn't taste the same… I like ducks and I like [Indigenous name for a type of marsh hen] and stuff like that… They don't taste the same, I really don't eat... And I used to be crazy about that and I really don't care for... In fact, I don't even eat chicken or pork anymore… Because when I see chicken, that the legs are this big, I won't eat it… That's not healthy.

When she was asked what she thought caused this change, she answered, "all the chemicals." This participant also described getting eggs from her son, who had his own chickens: "He grows his own chickens… I get my fresh eggs from my son." This participant noted that in her own family she was seeing a return to, and a desire to still live off the land.

"They Going to Die in That Saltwater": Barriers to Gardening

Although many women described gardening as being important in their families, especially while growing up, many stated that because of increased saltwater and flooding, it was getting harder and harder for people to continue to garden. Participant 1 described not seeing young people garden as much, although she also reported being excited to work on her relative's garden: "Gardening… I see some, young people doing that, but not like a whole bunch you know?... that's what I told my aunt… she's got a big garden…. [I'm] excited to be able to start helping out there cause I haven't been gardening forever." This participant noted that growing up she had helped her grandmother garden, and that helping out in the garden was a common chore for younger children:

> We all had our part to do, duties. Both of my grandmothers lived on the same street. When we were in school… we would go eat at our grand, one of the

> grandparents' house and walk over there… and then after school we would have to help with the garden, cause they both had huge gardens. So we had to all help out with that. All of us. So we grew up doing a lot of gardening.

Participant 4 also noted that young people no longer knew how to garden: "and the kids don't want to learn how to make a garden." Participant 11 attributed some of the decrease in gardening to environmental changes: "it's hard to grow fresh crops here with so much, so much salinity in our soil. So you won't find as many people [gardening]." Increased saltwater intrusion changed what types of crops and plants could grow in the soil. Participant 16 also noted the issue of saltwater intrusion:

> It's bad because of the saltwater. My husband plants peas and green beans but he's got it up in a container so the water don't... and everything else you can't plant orange trees because the saltwater… Even if you make a garden today when the water gets high what you going to do?... that's why we plant in those containers… I got all my flowers on my porch because they going to die in that saltwater.

Although this participant was able to adapt by putting some of her plants on her raised porch, this was not possible for a full garden and for fruit trees.

Although many women described gardening as being important in their families, especially while growing up, many stated that because of these changes to the land, it was getting harder and harder for people to continue to garden. Participant 11 attributed some of the decrease in gardening to these environmental changes:

> Food wise, it's just been decimated tremendously. Not only by processing… I mean like here in [state name] agriculture below [city name] is almost, almost nonexistent except for like sugar cane… because it's hard to grow fresh crops here with so much, so much salinity in our soil. So you won't find as many people [farming]. Our Elders, like my grandfather, he, he's been a gardener since he was six years old, helping his dad on a plantation and he's 84 years old now and he still has a garden, but he, every year he swears that he's not going to do it anymore… it's not worth the hassle because it's not producing what it once was. But a lot of that has to do with our grounds are so polluted and our grounds are so… chemical-ridden that is just like, it doesn't even pay to eat what comes out the ground sometimes… especially down here, there's so much salt in our soil that you can't even get anything to grow.

Pollution and increased saltwater intrusion changed what types of crops and plants could grow in the soil. This participant also noted that although previously many tribal members had worked in agriculture, because of the changes to the environment many of them no longer were able to grow crops and eat foods that they grew to the same extent. Participant 29 also described the hardship of growing a garden only to have it be destroyed by a storm and flooding:

> Like, you go to get just fruits and vegetables, it's expensive. Not many people grow their own things anymore either… you spend all this money having a garden… making a garden and then the flood comes in and wipes it all out… And we have a huge yard and I always say we have so much room to have a garden… it's just the floods… My brother actually was trying to grow some peppers and cucumbers and he did great… you just gotta be dedicated to it and know when to plant… around the hurricane season and you just hate to have it all wiped out if a flood comes.

Participant 10 also made the connection between the previous ability of tribal members to live off the land and their dependence now on the very companies that had destroyed the environment for food:

> And like the way we used to live… And then destroying the land… To where now we have to rely on you for the food. Like we have to rely on the Walmarts and like nobody farms anymore. [People] used to have like tons and tons of crops, people had crops, people had cattle, people had all their own livestock and everything, and so it's, all the gas exploration has really like stripped us of our ability to even care for ourselves and made us dependent on the very infrastructure that's destroying our environment.

Participant 1 described the important role that gardening played and the types of vegetables tribal members were able to grow previously:

> Oh, everything. I mean, everything was seasonal too. Green beans, okra. You know, squash, tomatoes, tomatoes, lasted pretty much all year long… tomatoes lasted. Cucumbers. Eggplant. Potatoes, onions. A lot of potatoes. We ate a lot of potatoes. We used to dig a lot of potatoes… I can just remember my grandma's garden.

Participant 11 described hoping that tribal members could learn more about aquaponics as a way to adapt to the changing conditions of the land:

> I think people learning how to do aquaponics… Where they [the plants] don't have to be necessarily in the ground… I think any kind of alternative planning like that, or self-sustaining kind of agriculture where we don't have to rely so much on what we've normally used, but adapt to these new ways of, you know, being, providing for ourselves and, and also at the same time keeping cultural… influences in there, of growing our own food… because there are people and organizations and other, and other groups that they've learned to adapt to these changing conditions… and kind of try and take back of this health crisis that we're in.

This participant noted her hope and confidence in the ability of tribal members to combat some of the changes that were happening to the land, while continuing to be able to provide for themselves.

Discussion

Findings highlight the impact of environmental and social justice issues on the food security of an Indigenous tribe located in the Gulf Coast. Tribal members described environmental and social justice issues that changed the land such that tribal members could no longer grow the foods they had traditionally grown, which contributed to food insecurity and undermined enculturation and resilience by obstructing subsistence practices (Burnette et al., 2018). Participants contrasted their current difficulties in successfully growing food with the experiences of their Elders and their experiences growing up, when tribal members were able to subsist off of the land. This ability to produce one's own food, rather than simply having access to food (i.e., food security) is a key tenet of food sovereignty and social justice, and tribal members describe clear disruptions to this process (Hoover, 2017; Menser, 2018).

In addition, tribal members expressed concerns about the impact of environmental justice issues such as oil company exploitation on the health of community members, through the contamination of food and water. Importantly, participants themselves saw and described the connection between environmental injustices, its impact on food security and availability, and their health. It is important to note that participants were not directly asked about environmental changes, or food security issues, highlighting the salience and importance of these issues for interviewees.

Many tribal members experienced a dissonant relationship with their oppressor (Burnette & Figley, 2017), as they were employed by corporate oil companies that undermined food and land security and Indigenous health, whilst simultaneously providing needed employment. Still, the ability to access fresh and safe seafood was severely impacted by corporate oil companies, undermining subsistence. The tension between dependence on local industry for employment, and concerns about its impact on the land and health of tribal members was prominent for tribal participants, and is consistent with previous studies noting this important social justice topic (McKinley et al., 2019). Tribal member's ability to recognize these impacts to the land emphasizes the particular part Indigenous peoples, and women in particular, play in noticing environmental changes because of their close relationship with nature through subsistence practices (Billiot, 2017; Billiot & Parfait, 2019; Burnette et al., 2019; Hoover, 2017; Hoover et al., 2012; Liddell et al., 2021; Liddell & Kington, 2021; Vivas, 2012). These changes to the land, and their potential causes, were evidenced in the connections participants drew about the detrimental impact of increased salinity on the success of their gardening, a subsistence activity that is practiced predominately by women (Hoover, 2017; Tully et al., 2019; Vivas, 2012).

Participants expressed their concerns that harmful environmental changes were undermining cultural knowledge and practices, which is a risk factor for negative outcomes across multiple dimensions (Burnette et al., 2018;

Burnette et al., 2019; Vernon, 2015). Gardening is also important because it encourages physical activity and time spent in nature, both of which are important for physical and spiritual health and wellbeing (Burnette et al., 2018; Maller et al., 2006; McKinley et al., n.d.). Enculturation, or engagement with cultural practices, has been found to contribute to Indigenous resilience and engagement through connection to land and subsistence practices (Burnette et al., 2018). Both enculturation and subsistence practices are damaged by environmental changes, since many cultural practices involve land-based activities and time spent outside (Billiot & Parfait, 2019; Burnette et al., 2018, 2019; Jessee, 2020; Kirmayer et al., 2009; McKinley et al., n.d.) There is a need to explore alternatives for tribes where gardening and relying on local food in the traditional form may no longer be possible, or where other barriers exist. This may be especially true for the context of this Indigenous group, where the land is disappearing due to coastal erosion. Participants worried about the impact of pollution on food and water because of industrial contamination, which is consistent with previous research that notes the environmental justice experiences of Indigenous peoples (Adamson, 2011; Hoover et al., 2012; Tsosie, 2007). Pollution from industries, such as oil, is particularly salient for this Indigenous group because of their lack of federal recognition, which makes holding the oil industry accountable or regulating its continued activities, difficult (Billiot & Parfait, 2019; Crepelle, 2018; Jessee, 2020; Maldonado, 2014). In addition to changing the land itself, the pollution from local industries, such as oil, can impact subsistence food practices (Burnette et al., 2019; Liddell et al., 2021; Rotkin-Ellman et al., 2012; Tirado et al., 2010). Pollution understandably contributes to concerns about contamination of these food sources, which directly undermines Indigenous health and food security (Liddell et al., 2021; McKinley et al., n.d.; Rotkin-Ellman et al., 2012). Pollution has deleterious impacts on health and wellbeing; it not only disrupts cultural subsistence practices, which contribute to resilience and bonding through intergenerational transmission of knowledge, but it also impairs Indigenous peoples' ability to consume traditional diets, necessitating the purchase of more processed and expensive foods (Bodirsky & Johnson, 2008; Burnette et al., 2018; Gracey & King, 2009). Federally recognized tribes have successfully enforced protections of the environment, including regulating companies and local governments located off-reservation but whose activities impact tribal members (Crepelle, 2018; Gilio-Whitaker, 2019).

The impacts of changes to food and gardening have especially important implications for social justice, as Indigenous peoples' physical health as well as cultural autonomy are undermined by these environmental changes. For instance, food has been described as medicine by some Indigenous scholars and activists (Adamson, 2011), and gardens have been proposed as a tool of decolonization through their reconnection with foodways and land, and as a way of addressing food security and health issues among Indigenous peoples

(Adamson, 2011; Hoover, 2017; Rudolph & McLachlan, 2013). Gardens return land and foodways to Indigenous communities in limited ways (Sowerwine et al., 2019). The relationship to land itself is distinct for Indigenous peoples; in contrast to the Western view of ownership of the land, the relationship to land for Indigenous peoples is based on recognition and reciprocity for the sustenance it gives (Kirmayer et al., 2009; Glenn, 2015). The relationship to the land also plays a role in many Indigenous conceptualizations of health and wellbeing, and resilience (Kirmayer et al., 2009). This connection to the land also means that environmental injustices may have particularly negative consequences for Indigenous peoples who live in close relationship with their environment (Cidro et al., 2015; Vernon, 2015).

Limitations

Findings from this qualitative data were emergent and sometimes unexpected, largely due to the methodology used, which prioritizes participants' voices and allows for their concerns to take precedence. A benefit to gathering data in this way is that the importance of food and food sovereignty was made salient without the participants being prompted; a limitation, is that we were not able to explore all of the relevant concepts related to food sovereignty. As such, important topics, such as the role of the community and the tribal council in reclaiming their food system and building food sovereignty in the face of these threats, were beyond this study's scope, and thus not explored in this inquiry. Future studies should explicitly follow up on emergent themes to explore food sovereignty and related topics in more depth, especially as they relate to community resilience and food sovereignty.

Another potential limitation is that the tribe's identity remains anonymous due to agreements with the tribal council, who requested their name not be identified. This is congruent with best practices in conducting research with Indigenous tribes and is related to previous negative experiences other Indigenous tribes have had with researcher exploitation (Burnette et al., 2014). Because environmental changes are often highly unique to particular geographic regions and historical and contemporary contexts, and considering the immense diversity among Indigenous peoples in the United States, these findings should remain specific to the tribe in this study. In addition, although a goal of this study was to explore the impact of environmental changes on the food practices of Indigenous women, individuals were only interviewed at one point in time. Future research may also want to explore the experiences of men who are uniquely impacted by their frequent employment by oil companies. Longitudinal studies may be better able to explore these changes. This study also focuses on self-reported experiences of the impact of environmental change on food practices, and

future research in fields such as public health or environmental sciences may be helpful in corroborating these findings.

Conclusion

Results demonstrate the importance of sovereignty as it relates to land for Indigenous peoples and highlights the significance of federal recognition for Indigenous peoples in achieving food security. The viability of land and subsistence practices are tied closely to the overall health of Indigenous peoples, particularly in areas like the Gulf Coast, where resources are frequently extracted by industry, or where the effects of climate change have more damaging consequences and important social justice implications. Despite the impact of these environmental changes and social justice issues on Indigenous food security, their interrelationships are infrequently explored. These findings fill an important gap in the literature by exploring the intersection of environmental, social justice and food security issues among a state-recognized Gulf Coast Indigenous tribe. This study documents how environmental changes have negatively impacted subsistence practices such as gardening, in addition to tribal member concerns about the impact of pollution on food and water sources, and tribal member health. This research builds upon previous research exploring the impact of environmental justice issues on Indigenous peoples and connects it to food justice and sovereignty movements (Burnette et al., 2018; 2019; Liddell et al., 2021). Viewed in the context of settler colonialism, these findings document how environmental justice issues such as pollution, industry exploitation, and climate change all further the goals of settler colonialism through undermining cultural practices and the health of Indigenous peoples. Important implications of these findings include the urgent need for federal recognition for tribal members and for their inclusion in the development of environmental policy and interventions. In addition, immediate action should be taken by both the public and private sector to address the extensive environmental damages and health impacts experienced by Indigenous communities.

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