

# Water is K'é: Learning from the Navajo Community to Promote Early Child Health

Carmen George, MS<sup>1,2</sup>  
Brianna John, MPP<sup>1,2</sup> ORCID 0000-0002-1482-5869  
Renee Goldtooth-Halwood, MPH<sup>3</sup>  
Ken Hecht, LLB<sup>4</sup>  
Christina Hecht, PhD<sup>4</sup>  
Laura Vollmer, MPH<sup>4,5</sup>  
Louise Benally, MA<sup>6</sup>  
Asia Soleil Yazzie, BA<sup>2</sup>  
Rachel Whitman, BS<sup>1,2</sup>  
Malyssa Egge, MS<sup>6</sup>  
Nora Nelson, MA<sup>8</sup>  
Kerlissa Bitah, BA<sup>7</sup>  
Eva Bennet, AA<sup>7</sup>  
Olivia Mott, MPH<sup>1,9</sup>  
Janet Mark<sup>10</sup>  
Shine K. Salt, MLS<sup>1,2</sup>  
Tierra H. M. Edison, BS<sup>2</sup>  
Sonya S. Shin, MD<sup>1,2</sup>

## AFFILIATIONS:

1. Division of Global Health Equity, Brigham and Women's Hospital, Boston MA
2. Community Outreach and Patient Empowerment Program, Gallup NM
3. Notah Begay III Foundation, Albuquerque NM
4. Nutrition Policy Institute, University of California, Division of Agriculture and Natural Resources
5. Cooperative Extension, University of California, Division of Agriculture and Natural Resources
6. Community member
7. T'iis Nazbas Community School, Teec Nos Pos AZ 86514
8. DigDeep, Los Angeles CA, 90021
9. Tulane University School of Public Health and Tropical Medicine, New Orleans LA 70118
10. Beclabito Day School, Beclabito NM 87420

## CORRESPONDING AUTHOR:

Carmen George  
cvgeorge@mgb.org

*Submitted 30 June 2023, revised 28 August 2023, accepted 2 October 2023.*

George, C., John, B., Goldtooth-Halwood, R., Hecht, K., Hecht, C., Vollmer, L., Benally, L., Yazzie, A.S., Whitman, R., Egge, M. Nelson, N., Bitah, K., Bennet, E., Mott, O., Mark, J., Salt, S.K., Edison, T.H.M., Shin, S.S. (2024) Water is K'é: Learning from the Navajo Community to Promote Early Child Health. *Progress in Community Health Partnerships*. (Forthcoming.) 3 January 2024.

**FUNDING SOURCES:** Robert Wood Johnson Foundation, Notah Begay III Foundation

**ACKNOWLEDGEMENTS:** We would like to express our gratitude for our Water is K'e Community Advisory Group and all of the community members who took part in our programs. In particular, we are indebted to the elders who generously shared their wisdom with us. We would like to thank the other Water First! Community Learning teams for their shared knowledge and ideas as we journeyed together to promote healthy beverages and reduce sugary drinks in our respective Native communities. We would like to express our sincere gratitude to the Navajo Nation Health Research Review Board for their valuable guidance and support during the research process (NRR-21.409).

**ABSTRACT:**

**Background:** Drinking water instead of sugary drinks is key to reducing health disparities. Since beverage habits are shaped by complex personal, community, and environmental factors, community input is critical to design any intervention promoting water.

**Objectives:** We worked with community partners to design a program to promote healthy beverage habits among young Navajo children.

**Methods:** The socioecological model, community-based participatory methods, and strengths-based principles shaped our process. In Phase 1, multigenerational feedback taught us about the cultural importance of water and how water quality concerns influence beverage choices. In Phase 2, our Water is K'é Community Advisory Group (CAG) played a leading role to design the intervention centered around cultural connection, health literacy, and water access.

**Lessons Learned:** Water is K'é was created through community partnership. Community listening and mini-pilots take time but allows the program to meet community's needs and interests.

**Conclusions:** The solutions to health disparities lie within the community itself.

**KEYWORDS:**

Navajo, preschool, early childhood, nutrition, beverages, sugar-sweetened beverage, water, Indigenous, community engagement

## Background

Among rural Indigenous communities, access to drinking water and consumption of sugar-sweetened beverages (SSBs) are important drivers of diet-related disparities, such as childhood obesity and type 2 diabetes.<sup>1-3</sup> Diet-related diseases disproportionately affect Indigenous youth, particularly in communities affected by water insecurity.<sup>1,4,5</sup>

The Navajo Nation reservation is a rural territory of more than 27,000 square miles across parts of Arizona, New Mexico, and Utah. Approximately 30% of households do not have reliable access to clean drinking water (i.e. safe and appealing). Since many families must drive more than an hour to reach the nearest town,<sup>6,7</sup> local options include hauling water from community filling stations, using unregulated sources such as wells and natural springs, purchasing bottled water at local convenience stores or gas stations, or relying on water trucks operated by non-profits. Many families use multiple sources, balancing complex factors such as water safety, cost, and distance when deciding where to get water and how to use it.<sup>8</sup>

Many water access issues on Navajo Nation today can be traced back to federal policies and industrial practices that amount to centuries of colonialism and systemic racism.<sup>9</sup> Surface water has become increasingly scarce, as rivers passing through the reservation have been dammed upstream or contaminated. Ground water sources are threatened due to resource extraction, such as mining of uranium and coal and fracking. Long after such activities cease, groundwater remains contaminated.<sup>10,11</sup> It is no surprise that many community members have continued concerns regarding local water quality, including tap water from Navajo Tribal Utility Authority

despite reassuring Consumer Confidence Reports.<sup>12</sup> This legacy has also led to grass-roots efforts to address issues of health, food and water sovereignty, and environmental justice.<sup>13-16</sup>

Since 2017, our team has worked in the Four Corners region of Navajo Nation to create a model to promote early child health by increasing healthy beverage consumption among Navajo children and their families. This manuscript describes the community-led process to develop a culturally-tailored intervention, Water is K'é, including each phase of our journey along with lessons learned.

## **METHODS**

This project came about in 2016, after our team had successfully launched a Produce Prescription Program<sup>17</sup>, but sought to understand more about beverage consumption as another important determinant of early child health and prevention of future chronic disease risk. At that time, the Notah Begay III (NB3) Foundation launched a grant (described below) which catapulted us into a journey of community listening and community-engaged program design.

### **Conceptual model**

The socioecological framework posits that health risk and outcomes are shaped by embedded spheres of inter-connected influence.<sup>18,19</sup> Families have the greatest self-efficacy when healthy choices are an “easy default” by eliminating access barriers and establishing positive social norms. Applying the socioecological framework, we sought to understand and address

interrelated spheres of influence: environmental (water access, contamination), community (confidence in tap water, Diné culture and traditions), interpersonal (intergenerational sharing, caregiver dynamics) and individual (child's behavior and health).

### **Community-based participatory approach (CBPR)**

CBPR is a process in which “the community is involved as an equal partner with the scientists... to ensure that interventions created are responsive to the community’s needs.”<sup>20</sup> By building community capacity and equitable research partnerships, CBPR is more likely to translate into sustainable evidence-based programs and advance health equity<sup>21</sup>. CBPR is particularly relevant for Indigenous community- research collaborations, providing a framework and evidence-based tools to build trusting, equitable partnerships and maximize benefits to the community<sup>22</sup>. For our team, CBPR was essential to ensure Water is K'é was culturally informed, impactful, and sustainable.

At the heart of our work is the Water is K'é Community Advisory Group (CAG). Members include early education teachers, community activists, cultural experts, health promotion experts, parents, and elders. While we began to hold meetings with an informal group of community advisors in 2019, the CAG was formalized in 2020 to review information gathered and co-design the intervention. Members were chosen to represent diverse community perspectives such as teachers, healthcare providers, public health specialists, and cultural specialists. The group has been very open, allowing people to attend as often as they wish. CAG input has included survey development, connecting to local events and early child education

(ECE) programs, doing interviews, designing, and troubleshooting the intervention, interpreting findings, and recommending next steps. For example, one CAG member (LB) interviewed elders and created a video on traditional teachings and cultural perspectives about water. The CAG also designed lesson plans and met monthly to troubleshoot challenges, including how to make sure teachers could offer the lessons even when COVID-19 required remote learning. The CAG met with annually broader community stakeholders to review progress and develop recommendations for next steps. While our team includes both academic researchers and community partners, this is not a distinct dichotomy as the majority of researchers are Navajo; as shown in **Table 1**, our team has complementary, overlapping expertise and shares a deep commitment to community engagement.

### **Strength-based approach**

Water is K'é is grounded in the strengths of Navajo culture, including the central concept of K'é. The Diné Policy Institute describes K'é as the “system of kinship observed between Diné people and all living things in existence<sup>7</sup>.” Actions motivated by affection, love, compassion, and solidarity are grounded in K'é. In this way, K'é is the foundation of family values, allowing people to map relations through their clans and underlying the responsibility of parents, grandparents, and extended relatives in raising a child. K'é extends beyond relationships among people to include our interconnectedness with the natural and spiritual world of living beings, water, and earth. The Diné people have a deep relationship with water, which is a living spiritual presence. The goal of this project is to strengthen these feelings through Diné culture and empower families and communities to raise healthy children.<sup>23</sup>

## **Phase 1: Community Listening**

We started with a community-based assessment from 2016-2019 as a grantee of the NB3F Community Action Grant. This grant supported community-driven strategies to reduce SSBs and increase access and consumption of drinking water and breastfeeding.<sup>24</sup> NB3F worked to strengthen capacity among Native American community groups through a mutual peer learning cohort and helped each group uplift a community-driven assessment to transition to policy, systems, and environmental strategies that moved beyond program development and grant objectives. Our team was grateful that NB3F included this assessment in the grant process, allowing us to first understand community knowledge about water and its impact on health, gather topics of interest, and gauge traditional beliefs and interests. This community input would, in turn, respectfully inform our planning.

**Data collection and analysis:** We decided to gather perspectives from multiple generations, using different methods for each age group. For adults, we developed a survey with 26 questions on demographics, water consumption, and traditional knowledge beliefs, which was administered at community events, such as Chapter House meetings and parent-teacher meetings. We also worked with DigDeep to hold a community focus group to understand water access conditions and potential solutions. For elders, a CAG member (LB) identified traditional knowledge holders through her personal connections and recorded video interviews discussing the sacredness of water, how water was used and how our relationship with water has changed over the years. For students (K-12), we collected a survey asking how often they consumed



different types of beverages. For children under seven with caregiver permission, we held “Rez Café” sessions at ECE sites, asking kids to put stickers on posters next to their favorite drinks and color how many glasses of water they drank. Participants consented to surveys, interviews and/or video recordings and received a thank-you gift, such as a water bottle. For quantitative data, we used Excel to generate descriptive statistics. Qualitative analysis combined open-ended survey responses and elder interviews; we developed a code book, coded interviews, and analyzed findings to identify predominant themes. We received approvals from the Northern and Eastern Navajo Agency Councils, Navajo Nation Board of Education, and the Navajo Nation Human Research Review Board (NRR-21.409).

**Community Needs Assessment Results:** From April 2017 to June 2018, we surveyed 109 community members. About 70% of respondents were female; 8% were 20 years or younger, 30% were 21-30 years old, 21% were 31-40 years old, 10% were 41-50 years old, and 31% were over 50 years old. Respondents consumed purchased water more than tap water (**Figure 1**). While 56% felt it was fine to drink tap water, 29% believed tap water contained unhealthy chemicals and only 41% thought tap water tasted good. Reasons for avoiding tap water included taste (26%), color (10%), and smell (9%), and safety (19%). From a cultural perspective, 77% felt that Diné traditions influenced what food and beverages they offered to their children.

From qualitative findings, elders shared the importance of water in Diné culture (**Box 1**), and parents and other younger adults expressed their wish to learn more about traditional teachings and pass this information to their children (**Box 2**). Both age groups felt that

parents / caregivers were the child’s “first teacher” in terms of teaching healthy lifestyles and Diné traditions. The listening session shared community views and practices that reflected long-standing environmental stewardship: families were careful to conserve water, using as little as two to three gallons per day (compared with 88 gallons used by average Americans). These frugal behaviors were influenced by traditional teachings advising to “take only enough” when it comes to food and water.<sup>8</sup>

We also learned a lot from children. Of 270 students who completed a survey, 124 were in pre-K through 4<sup>th</sup> grade, 134 were middle school, and 12 were in upper school. About half were girls, and 81.9% had running water at home. Almost all children drank water the day prior (**Figure 2**). Younger children drank more plain milk, flavored milk and fruit juice, while older children drank more regular soda. One of the most enjoyable events were the Rez Cafés, in which 45 children shared their preferences for SSB, especially drinks marketed to children (**Figure 3**).

We took away four lessons from our community listening. First, people connected water to their identity as Diné people and felt it was important to revitalize Diné culture, including teachings relevant to everyday practices, such as drinking water. Second, concerns about water safety and palatability influenced beverage choices. Purchased water was sometimes trusted more than tap water, leading to increased cost and reduced access. Third, SSBs were still popular among young children, suggesting an ideal age group to promote healthy beverage habits. Finally, the topic of water and health resonated strongly with community members who were eager to discuss this topic, better understand local water sources, and suggest future projects.

Building on a history of grass-roots activism, we sensed that communities were ready and empowered to bring about change.

## **Phase 2: Program Design and Refinement**

From 2018 through 2021, we worked to design the Water is K'é intervention. We decided to focus on sharing traditional water-based practices and incorporating cultural Navajo knowledge, while also increasing children's access to drinking water. This strength-based approach supported the community's wishes for inter-generational sharing of Navajo culture to younger generations. Also, rather than viewing local water sources as problematic, we took care to acknowledge the legitimacy and respect for water found in nature for its lasting physical and spiritual presence. Navajo culture has many strong ties to natural elements, and by navigating these issues through a cultural lens, we sought to bring positive harmony and have a more successful impact. Finally, we decided to focus on two to five year-olds and their parents / caregivers attending ECE programs, given national data and our community observations of SSB consumption in young children.<sup>25</sup> This approach would also build on our partnerships with ECE sites, such as Family and Child Education (FACE) and Head Start Programs. For context, FACE is a national tribal early childhood education / parental involvement program initiated in 1990 that supports families with children from prenatal to 5 years of age.

Using a socioecological framework, Water is K'é was built as a multi-level intervention with three strategies: sharing traditional teaching related to water; building health literacy; and promoting access to safe and palatable drinking water (**Figure 4**). Under the leadership of the

CAG, we used a test-and-learn process, developing and testing separate activities in “mini-pilots” to gauge community response and refine based on CAG reflections.

At the individual and inter-personal level, we developed a set of lesson plans for use by ECE teachers to promote healthy beverages. Multimedia activities were designed to engage children (painting, coloring, dancing, Water Warrior” picture frames) and parents/caregivers (parent-only sessions, parent tips to increase children’s access to water in the homes) to convey the importance of water in Diné tradition, promoting water as the healthiest beverage, and the effect of sugary drinks on children’s health. Each lesson was grounded in Diné culture, such as teaching words in Diné language, sharing Navajo stories, and viewing a 10-minute video featuring elder interviews along with imagery of local water sources. Sessions also used evidence-based behavior change strategies, such as goal-setting<sup>26</sup>.

At the environmental level, we designed a strategy to address water safety and palatability and increase access to children by allowing each ECE site and each family to identify steps to address any concerns about safety or taste based on their preferences. Since ECEs and families may have different concerns and solutions, we sought to honor preferences by “meeting them where they are at” rather than a one-size-fits-all approach. For instance, one Head Start might prefer to offer bottled waters at a self-serve station, whereas another may want to set up an infused water station using filtered tap water. Likewise, one family might be comfortable drinking tap water whereas another family may prefer purchased water. Allowing tailored “access plans,” while more complex, reflects a community-centered approach by trusting families and ECEs to identify solutions based on a menu of evidence-based options.

At the community level, we developed a campaign to promote positive social norms, creating posters that featured well-known local champions promoting water. The posters were designed to promote a “culture of health” by messaging the importance of water in Diné culture and celebrating local inter-generational heroes as positive role models<sup>27,28</sup>. In a mini-pilot, we distributed hundreds of posters to schools, stores, Chapter Houses, and healthcare facilities. The posters were well-received, and one community wanted to make a poster with their own local hero. As a result, we created an editable poster that allows a photo to be added, allowing each community and each family to honor their own champions.

An unexpected obstacle in this phase was the emergence of COVID-19. While we had initially envisioned an ECE-based intervention, we had to shift our approach to reach ECE and home settings since many ECEs changed to hybrid or home-based learning. We created flexible lesson plans that could be delivered in the home or classroom and added access plans to address water safety and palatability in homes (e.g., filtered water pitchers). We also included parent/caregiver water promotion strategies, i.e., frequently offering water to children at home. Adapting to the context of COVID-19 required deeper community leadership since CAG members had front-line insight as teachers and parents. While challenging, the adjustments resulted in a program with built-in flexibility to engage both home and ECE influences on child health.

## **LESSONS LEARNED**

Our journey of developing a culturally-based strategy to promote early child health has been a nurturing process of learning from the community. Over five years, our multidisciplinary team partnered with a dedicated CAG to learn from community members and then develop a multi-level intervention to promote healthy beverages among young Navajo children. Our team has reflected on several key lessons learned.

Community engagement takes time and resources. We have been fortunate to work with mission-driven sponsors that have allowed us to allocate time and funding to incorporate community-based participatory methods. The CAG was fundamental to this process; over time, their leadership deepened and required CAG formalization. This core group of dedicated stakeholders helped us throughout all phases, and their longitudinal involvement created a team with deep, collective understanding of the program's history. The CAG was even more crucial than anticipated when COVID-19 emerged, since only front-line teachers and community members had the expertise needed to pivot the program to meet community needs. We acknowledge CAG members as co-creators and recognize that Water is K'é belongs to the community and to the Navajo Nation.

Community listening and flexible mini-pilots allowed us to try different activities and build a multi-component strategy. Rather than approaching the community for feedback on pre-conceived ideas, we listened with an open mind to all age groups, from toddlers to elders. Based on the listening phase, we then moved to the program development phase using an open exploratory approach. Mini-pilots of different components helped us gauge community response

and respond to their feedback. By refining core components that collectively mapped onto our conceptual framework, we were able to distill the final Water is K'é “package.”

Factors shaping beverage behaviors were complex and in turn required multi-level interventions. We came to appreciate that caregiver decisions are shaped by a complex set of factors including health literacy, family tastes and preferences, cultural teachings, and water access. Furthermore, understanding access to water requires appreciating physical access (e.g. running water in the home, distance to a store), economic access (cost of travel and water) and feeling assured about water quality. Our interviews revealed that a significant portion of individuals felt their tap was not safe (29%) or tasty (41%). Similar findings have been described among Indigenous communities and other communities of color resulting in a preference for bottled water over tap, particularly when trust in public systems has been historically eroded<sup>29,30,31,32</sup>. While infrastructure improvements were rarely suggested among community members, this could be due to the nature of our questions (which did not specifically probe this topic) or due to respondents' preference to focus on cultural solutions. Based on these findings, our intervention was designed to address both behavior and access, while respecting each family's preferred water sources. Our intervention also provided messaging to increase water consumption and reduce SSB, since we saw opportunities to shift both aspects of beverage intake.

COVID-19 presented unexpected challenges and opportunities. Our original goals for Phase 2 were to carry out a randomized community trial, funded by a Robert Wood Johnson Foundation Healthy Eating Research grant. Instead, we were forced to re-think the intervention

and push back our study timeline. In Spring 2020, ECE teachers expressed the urgent need for “easy-to-use” remote lesson plans that met teaching requirements; our lesson plans met those needs and thus facilitated teachers’ work. Without such changes, it would have been impossible to pilot a program that demanded additional teacher effort in the midst of a pandemic. We feel that our ability to offer *Water is K’é* to more than 100 children at six FACE programs from 2022 to 2023 reflects our strong partnerships and the benefits of the program perceived by teachers and families. Regardless, our study was hampered: we were unable to roll out all components, focusing instead on the lesson plans and family access plans, without implementing changes to ECE settings or the community campaign. Furthermore, given delays and roll out challenges, we shifted our evaluation efforts from a controlled trial to a pre-post pilot evaluation. Nonetheless, the rewards of developing a flexible user-friendly program and being able to support ECE partners during COVID-19 far outweighed the sacrifices. A future comparative study could provide more rigorous evaluation of the program’s effectiveness.

## CONCLUSIONS

This study describes how a community-based intervention was designed through community partnership, from initial listening to program development. The program was guided by a CAG, whose leadership deepened over time. Building on the partnerships, community leadership, and promising program design, next steps will include evaluating pilot results and exploring interest for expanding to other ECE programs throughout Navajo Nation.



1. Bullock A, Sheff K, Moore K, Manson S. Obesity and Overweight in American Indian and Alaska Native Children, 2006-2015. *Am J Public Health*. Sep 2017;107(9):1502-1507. doi:10.2105/AJPH.2017.303904
2. *Sugary Drinks in Communities of Color: Recent Research and Policy Options to Reduce Consumption*. 2015. Accessed 9/2/2019. [http://www.kickthecan.info/system/files/Leadership%20for%20Healthy%20Communities\\_Sugary%20Drinks%20in%20Communities%20of%20Color.pdf](http://www.kickthecan.info/system/files/Leadership%20for%20Healthy%20Communities_Sugary%20Drinks%20in%20Communities%20of%20Color.pdf)
3. Rousham EK, Goudet S, Markey O, et al. Unhealthy Food and Beverage Consumption in Children and Risk of Overweight and Obesity: A Systematic Review and Meta-Analysis. *Adv Nutr*. Oct 2 2022;13(5):1669-1696. doi:10.1093/advances/nmac032
4. Mitchell FM. Water (in)security and American Indian health: social and environmental justice implications for policy, practice, and research. *Public Health*. Nov 2019;176:98-105. doi:10.1016/j.puhe.2018.10.010
5. Dabelea D, Mayer-Davis EJ, Saydah S, et al. Prevalence of type 1 and type 2 diabetes among children and adolescents from 2001 to 2009. *JAMA*. May 7 2014;311(17):1778-86. doi:10.1001/jama.2014.3201
6. Executive Summary Navajo Nation Department of Water Resources. Accessed December 29, 2022, <https://nndwr.navajo-nsn.gov>
7. Eldridge D MJ, Jackson R, Denny A, Yazzie R, Crotty A, Curley C. *Diné Food Sovereignty: A Report on the Navajo Nation Food System and the Case to Rebuild a Self-Sufficient Food System for the Diné People*. 2014. Accessed September 24, 2019. <https://www.dinecollege.edu/wp-content/uploads/2018/04/dpi-food-sovereignty-report.pdf>
8. McGraw G, Fox R. *Closing the Water Access Gap in the United States: A National Action Plan*. 2019. Accessed January 16, 2023. [https://static1.squarespace.com/static/5e80f1a64ed7dc3408525fb9/t/6092ddcc499e1b6a6a07ba3a/1620237782228/Dig-Deep\\_Closing-the-Water-Access-Gap-in-the-United-States\\_DIGITAL\\_compressed.pdf](https://static1.squarespace.com/static/5e80f1a64ed7dc3408525fb9/t/6092ddcc499e1b6a6a07ba3a/1620237782228/Dig-Deep_Closing-the-Water-Access-Gap-in-the-United-States_DIGITAL_compressed.pdf)
9. Water Security on the Navajo Nation Office of Environmental Policy and Compliance, Department of Interior. Accessed June 19, 2023, <https://storymaps.arcgis.com/stories/591cdbfe18eb4aaea687139fc10c0c90>
10. Water Sampling Results in the Navajo Nation. United States Environmental Protection Agency. Accessed June 19, 2023, 2023. <https://www.epa.gov/navajo-nation-uranium-cleanup/water-sampling-results-navajo-nation>
11. Murphy M, Barney Y, Begay M-G, et al. Investigation of Household Drinking Water Sources and Contaminant Exposures in the Navajo Nation, 2008-2009. *Epidemiology*. 2011;22(1)(S114)doi:10.1097/01.ede.0000392017.19012.35
12. 2021 Consumer Confidence Report. Navajo Tribal Utility Authority. Accessed June 19, 2023, <https://www.ntua.com/2021-ccr.html>
13. Shapiro E. "It's Critical That The Rivers Continue to Flow." Environmental Activist Nicole Horseherder on Reclaiming Water Rights for Native Americans. Time Magazine 2021.
14. Sanchez C. Nobody Can Live Without Water. Harpets Bazaar 2021.
15. Our Story: the Indigenous Led Fight to Protect Greater Chaco. Accessed June 19, 2023, <https://www.wearegreaterchaco.com>
16. *Understanding the Healthy Diné Nation Act of 2014*. Accessed June 19, 2023. <https://nec.navajo->

[nhs.gov/Portals/0/Projects%20Webpage/HDNA%20Webpage/HDNAbooklet.v7b.Oct8.2019.PRINTQUALITY%20\(002\).pdf](https://nhs.uk/portals/0/projects%20webpage/hdna%20webpage/hdna-booklet.v7b.oct8.2019.PRINTQUALITY%20(002).pdf)

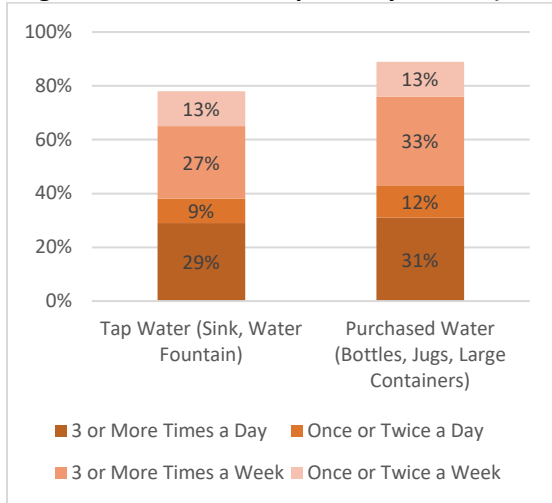
17. Sundberg MA, Warren AC, VanWassenhove-Paetzold J, et al. Implementation of the Navajo fruit and vegetable prescription programme to improve access to healthy foods in a rural food desert. *Public Health Nutr.* Aug 2020;23(12):2199-2210. doi:10.1017/S1368980019005068
18. Bronfenbrenner U. Ecological models of human development. *International Encyclopedia of Education* Elsevier; 1994.
19. Willows ND, Hanley AJ, Delormier T. A socioecological framework to understand weight-related issues in Aboriginal children in Canada. *Appl Physiol Nutr Metab.* Feb 2012;37(1):1-13. doi:10.1139/h11-128
20. Community-Based Participatory Research Program (CBPR). National Institute on Minority Health and Health Disparities. Accessed January 3, 2023. <https://www.nimhd.nih.gov/programs/extramural/community-based-participatory.html>
21. Wallerstein NB, Yen IH, Syme SL. Integration of social epidemiology and community-engaged interventions to improve health equity. *Am J Public Health.* May 2011;101(5):822-30. doi:10.2105/AJPH.2008.140988
22. Ortiz K, Nash J, Shea L, et al. Partnerships, Processes, and Outcomes: A Health Equity-Focused Scoping Meta-Review of Community-Engaged Scholarship. *Annu Rev Public Health.* Apr 2020;41:177-199. doi:10.1146/annurev-publhealth-040119-094220
23. Skouteris H, Bergmeier HJ, Berns SD, et al. Reframing the early childhood obesity prevention narrative through an equitable nurturing approach. *Matern Child Nutr.* Jan 2021;17(1):e13094. doi:10.1111/mcn.13094
24. NB3 Foundation releases eight-part video series highlighting Water First! community partners. Accessed June 19, 2023, <https://www.nb3foundation.org/2019/12/11/nb3-foundation-releases-eight-part-video-series-highlighting-water-first-community-partners/>
25. Welker EB, Jacquier EF, Catellier DJ, Anater AS, Story MT. Room for Improvement Remains in Food Consumption Patterns of Young Children Aged 2-4 Years. *J Nutr.* Sep 1 2018;148(9S):1536S-1546S. doi:10.1093/jn/nxx053
26. Epton T, Currie S, Armitage CJ. Unique effects of setting goals on behavior change: Systematic review and meta-analysis. *J Consult Clin Psychol.* Dec 2017;85(12):1182-1198. doi:10.1037/ccp0000260
27. Building a Culture of Health. Robert Wood Johnson Foundation. Accessed June 19, 2023, <https://www.rwjf.org/en/building-a-culture-of-health.html>
28. Water Is K'é. Community Outreach and Patient Empowerment. Accessed June 19, 2023, <https://www.copeprogram.org/water-is-k-e>
29. Brooks SK, Patel SS. Psychological Consequences of the Flint Water Crisis: A Scoping Review. *Disaster Med Public Health Prep.* Jun 2022;16(3):1259-1269. doi:10.1017/dmp.2021.41
30. Dupont D, Waldner C, Bharadwaj L, et al. Drinking water management: health risk perceptions and choices in First Nations and non-First Nations communities in Canada. *Int J Environ Res Public Health.* May 30 2014;11(6):5889-903. doi:10.3390/ijerph110605889
31. Colburn AT, Kavouras SA. Tap Water Consumption and Perceptions in United States Latinx Adults. *Nutrients.* Aug 28 2021;13(9)doi:10.3390/nu13092999

	Navajo citizen	Academic research	Water, environment	Early child education	Nutrition, Health Promotion	Policy	Community engagement	Cultural expert	Parent, Caregiver	Student
CG	x	x	x				x		x	
BJ	x	x				x	x			x
SKS	x	x	x			x	x			
RGH	x	x	x		x	x	x	x	x	x
KH		x		x	x	x	x		x	
CH		x	x		x	x			x	
LV		x	x		x	x				
LB	x		x				x	x	x	
ME			x	x	x	x	x			
NN		x	x			x	x	x		
THME	x	x		x	x		x			
KB	x			x			x		x	
RW	x	x					x			x
EB	x			x	x		x		x	
OM		x	x		x		x			x
ASY	x	x	x	x	x		x	x	x	x
JM	x			x			x		x	
SSS		x			x		x		x	

32. Hess JM, Lilo EA, Cruz TH, Davis SM. Perceptions of water and sugar-sweetened beverage consumption habits among teens, parents and teachers in the rural south-western USA. *Public Health Nutr.* Jun 2019;22(8):1376-1387. doi:10.1017/S1368980019000272

**Table 1: Team Expertise**

**Figure 1: Water consumption, By Source (N=109)**



**Box 1: Quotes from Elders**

*“[Water] has influenced me culturally, we used to plant corn, melons, beans, squash and we were very healthy. Water was all that we drank, and water was cold and clear that came down from the mountains.”*

*“Water is life. Water sustains all life. We come from water, we have clans from water. Water is very important.”*

*“I was told that water was always considered life. They use water in many of our ceremonies.”*

**Box 2: Quotes from Younger Adults**

*“I have changed my lifestyle to try to be healthier. Grandma and Cheii (Grandpa) always say, ‘Drink more water. Water is life, water is medicine, water heals, water was here before us.’”*

*“I sometimes need a refresher on traditional teachings to be motivated to buy the right foods.”*

*“I personally was not raised traditionally but I'm in the process of learning traditional teachings.”*

*“When we as parents make the changes to drink more water, it would be more influential for our children.”*

**Figure 2: Self-Reported Beverage Consumption Among Navajo Children (N=270)**

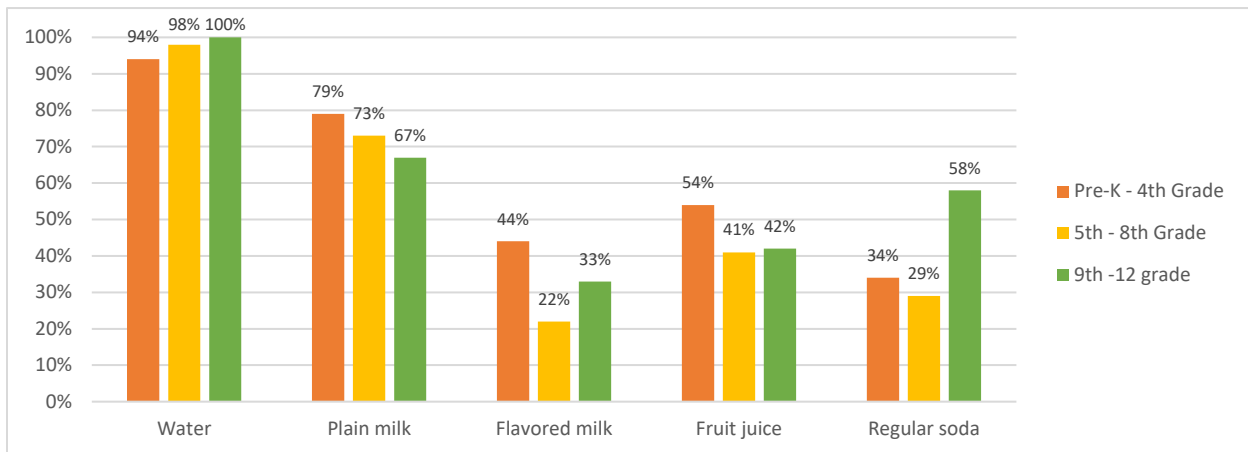


Figure 3: Children's Favorite Drinks (N=45)

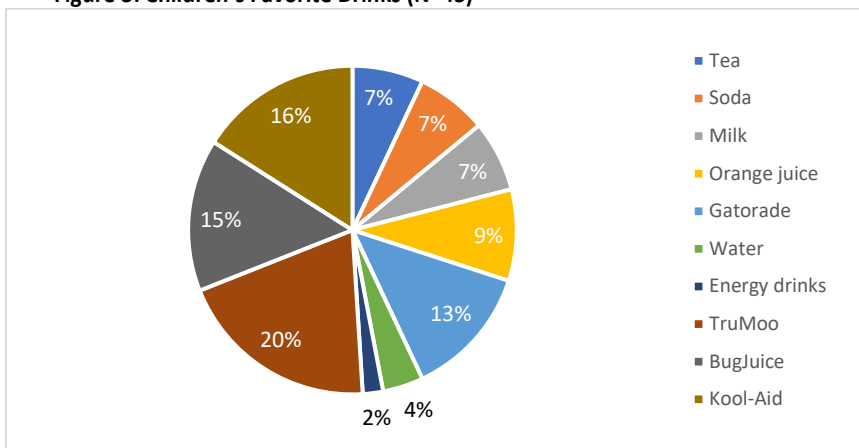


Figure 4: Water is K'é Design Based on Community Need Assessments

Strategies	Activities
 <p><b>Cultural connection</b></p> <ul style="list-style-type: none"> <li>Diné language and traditions</li> <li>Intergenerational sharing</li> </ul>	 <p><b>Lesson Plan</b></p> <ul style="list-style-type: none"> <li>Four monthly sessions by ECE staff</li> <li>Activities for kids and caregivers</li> </ul>
 <p><b>Health literacy</b></p> <ul style="list-style-type: none"> <li>Healthy benefits of water</li> <li>Health consequences of SSBs</li> </ul>	 <p><b>Access plan</b></p> <ul style="list-style-type: none"> <li>Tailored for each family and ECE site</li> <li>Ensure confidence in drinking water</li> </ul>
 <p><b>Access to water</b></p> <ul style="list-style-type: none"> <li>Confidence in water safety</li> <li>Offering water throughout the day</li> </ul>	 <p><b>Campaign</b></p> <ul style="list-style-type: none"> <li>Diné champions as local heroes</li> <li>Community-wide connection to water</li> </ul>

