



October 2024

## Preventing Musculoskeletal Disorders in Navajo Weavers

Ramona F. Yazzie

*Rocky Mountain University of Health Professions - USA, ramona.yazzie@rm.edu*

Kimberly Masker

*Rocky Mountain University of Health Professions - USA, kimberly.masker@rm.edu*

Kristin Biggins

*Rocky Mountain University of Health Professions - USA, kristin.biggins@rm.edu*

Follow this and additional works at: <https://scholarworks.wmich.edu/ojot>



Part of the Occupational Therapy Commons

### Recommended Citation

Yazzie, R. F., Masker, K., & Biggins, K. (2024). Preventing Musculoskeletal Disorders in Navajo Weavers. *The Open Journal of Occupational Therapy*, 12(4), 1-5. <https://doi.org/10.15453/2168-6408.2265>

This document has been accepted for inclusion in The Open Journal of Occupational Therapy by the editors. Free, open access is provided by ScholarWorks at WMU. For more information, please contact [wmu-scholarworks@wmich.edu](mailto:wmu-scholarworks@wmich.edu).

---

## Preventing Musculoskeletal Disorders in Navajo Weavers

### Abstract

The Navajo Nation is one of the many reservations that lack access to health care services, leading to increasing chronic health conditions. Navajo rug weaving is a common creative occupation on the reservation. Navajo rug weaving involves multiple steps in creating a beautiful rug. The multiple steps include repetitive gripping, pinching, reaching, pulling, and prolonged sitting. Therefore, weavers are at risk for developing musculoskeletal disorders (MSDs), preventing individuals from participating in meaningful occupations. Occupational therapists have the skills to provide appropriate education through active listening, visual handouts, and family members. However, occupational therapists must demonstrate and understand cultural sensitivity to address cultural occupations. This article will provide strategies for modeling understanding of the Navajo people, *Diné*, and rug weaving.

### Comments

The authors declare that they have no competing financial, professional, or personal interest that might have influenced the performance or presentation of the work described in this manuscript.

### Keywords

cultural competency, cultural sensitivity, Native Americans, occupational therapy, weaving

### Credentials Display

Ramona F. Yazzie, OTD, OTR/L; Kimberly Masker, OTD, OTR/L, CHT; Kristin Biggins, OTD, OTR/L, CHT, CLT

Copyright transfer agreements are not obtained by The Open Journal of Occupational Therapy (OJOT). Reprint permission for this Opinions in the Profession should be obtained from the corresponding author(s). Click [here](#) to view our open access statement regarding user rights and distribution of this Opinions in the Profession.

DOI: 10.15453/2168-6408.2265

The Navajo people, *Diné*, reside in New Mexico, Arizona, and Utah. Traditional Navajo stories tell the creation of the people and how deities created meaningful objects for the *Diné* to use on earth. The *Diné* believe every living thing and occupation has a meaning behind it. The deities representing the earth, sun, rain, and lightning created rug weaving. Creation stories say Spider Woman, a deity who helped create the universe, taught the *Diné* how to weave. Navajo rug weaving is a meaningful occupation, as once mastered, it is believed that the individual will not experience poverty. Today, many female and male *Diné* are weavers.

Creating a beautiful rug involves a tremendous amount of work, starting with gathering sheep wool and then cleaning, carding, spinning, and dyeing the yarn. Assembling the weaving loom is another process that involves warping the strings around the loom bars. The weaving process occurs in a quiet room and is completed only during the daytime. Many weavers sit on the floor, representing a connection with Mother Earth. Some weavers can sit for hours weaving and singing or in complete silence in their thoughts.

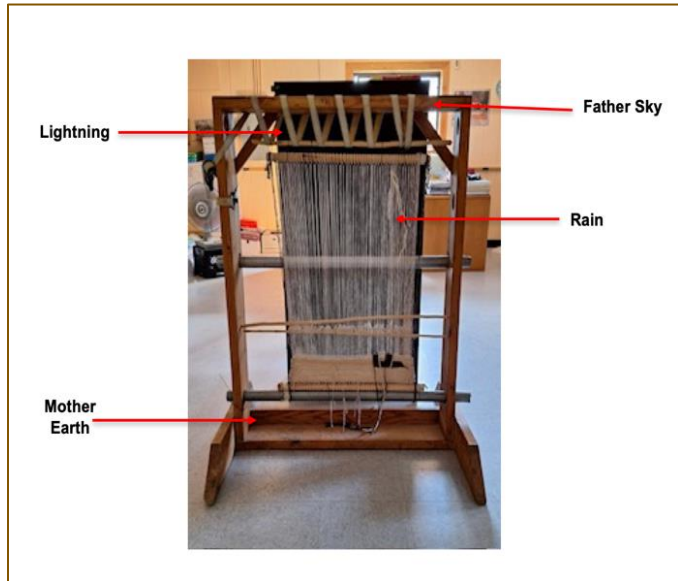
Weavers are more likely to report developing health problems, particularly musculoskeletal disorders (MSDs), that affect the back, shoulders, and wrists (Afshari et al., 2015). Navajo weavers are at risk for developing MSDs as a result of prolonged sitting, repetitive gripping and pinching, and overhead reaching. The Navajo Nation is one of the many reservations that lack access to health care, often leading to the neglect of health conditions or injuries (Rizzo, 2019). MSDs are one of the leading causes of disability in the United States, affecting at least 50% of adults 65 years of age and older (Ottesen et al., 2022). MSDs lead to health problems in the joints, cartilage, muscles, nerves, tendons, ligaments, and skeletal system (Mallapiang et al., 2021). According to Ottesen et al. (2022), the percentage of MSDs and the availability or accessibility of orthopedic surgical care is unknown in American Indians and Alaskan Natives, putting individuals at risk for chronic conditions.

The American Occupational Therapy Association's (AOTA) *Vision 2025* aims to provide accessibility and effective solutions for patients to participate in everyday activities (AOTA, 2017). Occupational therapists work in different settings and populations to help implement interventions through adaptation and modifications. Cultural sensitivity must be demonstrated to build patient trust and respect. Cultural competency will help provide a better understanding of the culture, environment, and meaning behind an occupation, ensuring that occupational therapists can deliver quality care in preventing injuries and disabilities. Understanding the meaning behind each structure and the tools used in Navajo rug weaving is extremely important for occupational therapists to provide appropriate interventions.

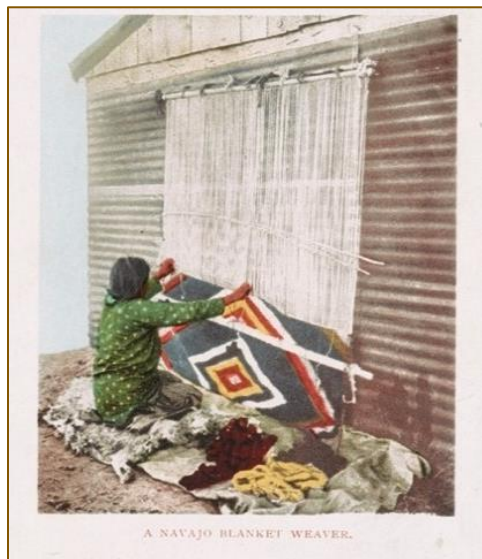
### **Weaving Experience**

The Navajo loom structures have different representations. In Figure 1, the lower bottom loom represents Mother Earth, the warps represent rain, the top of the loom bar represents the sky, and the rope that holds the tension bar and the permanent bar on top represents lightning. The traditional Navajo weaving loom was created to be upright following the representation of the loom. It also makes the height more accessible for the weaver sitting on the floor. In Figure 2, the weaving comb is used to push down the yarn and make a beating sound representing thunder. The weaving comb is also believed to protect an individual from starvation.

It has been said that the weaving process represents life. Therefore, the weaving process is imperfect, meaning mistakes will be woven into the rug without knowing. Mistakes in the rug represent life challenges, but the unique designs are the steps to overcome difficult situations, resulting in a beautiful rug. Drawing the design of a rug is never done; it is completed in thought and silence.

**Figure 1***A Navajo Weaving Loom***Figure 2***A Handcrafted Weaving Comb*

There is limited literature on Navajo rug weaving, although some literature exists about other cultures and rug weaving. Rug weaving is practiced in countries such as India, Pakistan, Bangladesh, Iran, Turkey, and China (Pavana & Mica, 2021). It is a source of income for the *Diné* weavers and is considered art that can be hung on the walls of a home. Navajo rugs are also worn as traditional dresses for special occasions, such as ceremonies. Through the beautiful creation, the preparation and process require dedication and diligence. Iranian rug weavers have a looming structure similar to the *Diné*. Afshari et al. (2015) described that carpet weavers perform the task with their arms elevated and unsupported and their trunks flexed forward while sitting on the floor for long periods (see Figure 3). According to the authors, weavers expose themselves to MSDs from a back posture and prolonged sitting without appropriate rest breaks. Mallapiang et al. (2021) examined the posture and MSDs in the Lip'Sa'be Mandar weavers in Karama Village in Indonesia. The authors found that the weavers were at moderate to high risk for developing MSDs because of poor posture. Another study by Nejad et al. (2021) found that MSDs lowered the carpet weavers' grip and pinch strength over time.

**Figure 3***A Navajo Blanket Weaver*

Note. A Navajo weaver sitting on the ground. Adapted from A Navajo blanket weaver, by Wikimedia Common. In the public domain.

([https://commons.wikimedia.org/wiki/File:A\\_Navajo\\_Blanket\\_Weaver\\_\(NBY\\_428893\).jpg](https://commons.wikimedia.org/wiki/File:A_Navajo_Blanket_Weaver_(NBY_428893).jpg))

## Cultural Competency

Many occupational therapists work in underserved communities and encounter a variety of diagnoses and diverse patients. According to Grandpierre et al. (2018), cultural competency has been a concern in rehabilitation services because of increasingly diverse populations. Language and cultural barriers affect care access, leading to health concerns. The authors stated that culturally competent services are challenging because culture influences values, beliefs, health-related practices, rehabilitation interventions, and assessment bias that can lead to misdiagnosis. Occupational therapists have faced challenges through language barriers and the influences of cultural differences. Language barriers are a challenge for occupational therapists because they cannot communicate effectively, which prevents building rapport between the patient and the occupational therapist, affecting the patient relationship. The influence of cultural differences depends on how an individual views their disability, independence, and role. For example, some cultures take care of their loved ones with an illness by doing their household and self-care activities for them. These barriers prevent delivering effective therapy treatment and compliance.

Therefore, understanding the Navajo way of life will help health practitioners deliver appropriate services to prevent health concerns. The Navajo way of life is described as having balance, harmony, and beauty, known as *hózhó*. *Hózhó* is a Navajo philosophy taught by the elders to the younger generation. Positive thought, communication, respect, and relationships are significant values. Living in harmony consists of being humble, intelligent, respectful, thoughtful, an active listener, generous, spiritual, understanding, and exhibiting self-control (Kahn-John [Diné] & Koithan, 2015). Any negative thought, speech, or behavior disturbs the balance of *hózhó*. In the case of imbalance, individuals seek prayer, ceremonies, or medical attention to bring them back to harmony.

Communication in the *Diné* culture is valued and powerful. Negative thoughts and speech should never be spoken; wishing negativity against self or others is taboo. To demonstrate active listening, silence in conversation is appropriate (Rizzo, 2019), demonstrating respect for the individual speaking.

The value of relationships is based on kinship, known as *Ké*; it connects an individual through family, clan, community, and environment (Kahn-John [Diné] & Koithan, 2015), bringing a unique connection through respect and trust. The *Diné* have four clans representing who they are and where they come from. A person is identified through kinship, based on their clans; one is greeted based on relationships, such as *amá* (mom), *azhé'é* (dad), *amá sání* (grandmother), *acheii* (grandfather), and *awéé'* (child), demonstrating respect. Using kinship terms builds a sacred bond and trust with one another. Often, *Diné* extends relationships to animals, spirits, objects, and elements of nature. For instance, livestock, such as sheep and goats, are valuable and commonly raised to sell wool or the wool is processed to create rugs and blankets for income (Rizzo, 2019).

Occupational therapists need to practice cultural competency through listening and learning about the culture. Understanding an individual's story will help build rapport and trust in providing effective services. It would further benefit occupational therapists to understand the representation of the weaving loom as meaningful, in addition to the idea that the prayers and songs behind the story of weaving can lead to *hózhó*.

## Moving Forward in Beauty

Occupational therapists have the knowledge and creativity to provide patients with effective interventions. Based on previous literature, occupational therapists can successfully provide ergonomic interventions through modification based on education and demonstration of cultural competency.

Occupational therapists can offer quality services for Navajo weavers who may suffer from MSDs by practicing cultural sensitivity and understanding Navajo culture through relationships and communication.

In delivering a diagnosis of MSDs to a *Diné* patient, using positive talk, a soft tone, and speaking in the third person is best to show respect. Visual handouts will be helpful to educate on anatomy related to the specific diagnosis (e.g., carpal tunnel anatomy) and to give the patient an understanding of the causes of their signs and symptoms. Studies have shown that visual handouts help patients understand their diagnosis (Lalla et al., 2020), especially for MSDs, which can be complex. It reassures the patient that MSDs can be prevented through proper body mechanics, adaptive techniques, and a home exercise program.

In addition to visual handouts, demonstrations can be helpful when educating Navajo weavers to understand proper body mechanics, modifications, and other recommendations to improve their work area. Ramdan and Candra (2021) found that when weavers adjusted the looms and seat height, their posture improved, and they had fewer pain complaints. Occupational therapists can provide different strategies to prevent MSD complications through recommendations, such as adjusting the weaving loom height and sitting on a supportive cushion or a chair to keep elbows and wrists neutral.

A systematic review by Roll and Hardison (2017) examined the effectiveness of occupational therapy interventions for adults with MSD and found various interventions like splinting, exercises, and early activity movement were beneficial treatments. Night or full-time splinting with stretching, tendon, and nerve gliding was found to be an effective treatment for carpal tunnel syndrome. Occupational therapists can also include built-up handles or design handles to provide wrist support that Navajo weavers can use while weaving.

Other literature addressed improving the loom and chair height to improve work posture and reduce MSDs in workers (Mallapiang et al., 2021; Ramdan & Candra, 2021). Pavana and Mica (2021) suggested that frequent breaks and back support will help reduce lumbar stress, demonstrating that ergonomic improvement can promote the health and well-being of weavers and promote cultural importance. Older literature has found that adapting or modifying weaving tools for use by Iranian carpet weavers was more comfortable and acceptable. Such modifications included increasing the hand grip size to avoid a forceful grip and increasing the handle length to keep the wrist neutral (Motamedzade et al., 2007).

Since relationship or kinship is valued in the *Diné* culture, it is beneficial to involve family members in patient education and interventions. Family members have been found to be patients' prominent supporters in the home by helping them manage their health (Lalla et al., 2020). Interpreters and family members also help establish patient-therapist relationships through rapport and trust, which could help break the communication barrier to provide quality services (Grandpierre et al., 2018).

Knowledge of the *Diné* culture will help occupational therapists develop effective and relevant interventions. Practicing positive communication, providing visual aids for education and home exercise programs, and involving family members during treatment will benefit Navajo weavers and help prevent MSDs in the future.

## Conclusion

Although cultural competency is a concern in health care, understanding a person's culture and values will help develop cultural awareness and bring connectivity. Knowledge of the Navajo culture and values will guide appropriate interventions and treatment delivery. Practicing the Navajo



philosophy *hózhó* through positivity will impact an individual's health and lifestyle. Occupational therapists can educate and recommend proper body mechanics and adaptive techniques to prevent upper extremity MSDs. Health care providers should honor and respect *Diné* culture in planning and implementation to provide successful medical care.

In conclusion, there is a need for further research in occupational therapy to address Navajo weavers and cultural occupations and provide appropriate treatment and interventions. Research is necessary to improve cultural competency for occupational therapists who work in rural American Indian communities and to provide information on how to integrate effective interventions through education, family, and interpreters. Research is also required to help advance effective treatment and prevent medical health conditions in underserved areas so that occupational therapists can continue to provide evidence-based practice and interventions to cultural minorities.

**If you enjoyed this article and are able to give, please consider a contribution to support OJOT's mission of providing open-access to high quality articles that focus on applied research, practice, education, and advocacy in the occupational therapy profession. <https://secure.wmualumni.org/s/give?funds=POJO>**

## References

- Afshari, D., Motamedzade, M., Salehi, R., & Soltanian, A. R. (2015). The impact of ergonomics intervention on trunk posture and cumulative compression load among carpet weavers. *Work*, 50(2), 241–248. <https://doi.org/10.3233/WOR-131701>
- American Occupational Therapy Association. (AOTA). (2017). Vision 2025. *American Journal of Occupational Therapy*, 71(3), 7103420010. <https://doi.org/10.5014/ajot.2017.713002>
- Detroit Photographic Co. (1901). *A Navajo blanket weaver* [Photograph]. Library of Congress. <https://www.loc.gov/pictures/item/2016653224/>
- Grandpierre, V., Milloy, V., Sikora, L., Fitzpatrick, E., Thomas, R., & Potter, B. (2018). Barriers and facilitators to cultural competence in rehabilitation services: A scoping review. *BMC Health Services Research*, 18(23). <https://doi.org/10.1186/s12913-017-2811-1>
- Kahn-John (Diné), M., & Koithan, M. (2015). Living in health, harmony, and beauty: The Diné (Navajo) Hózhó wellness philosophy. *Global Advances in Health and Medicine*, 4(3), 24–30. <https://doi.org/10.7453/gahmj.2015.044>
- Lalla, A., Salt, S., Schrier, E., Brown, C., Curley, C., Muskett, O., Begay, M.-G., Shirley, L., Clark, C., Singer, J., Shin, S., & Nelson, A. K. (2020). Qualitative evaluation of a community health representative program on patient experiences in Navajo Nation. *BMC Health Services Research*, 20(1), 24. <https://doi.org/10.1186/s12913-019-4839-x>
- Mallapiang, F., Azriful, Nildawati, Syarfaini, Muis, M., & Adriansyah. (2021). The relationship of posture working with musculoskeletal disorders (MSDs) in the weaver West Sulawesi Indonesia. *Gaceta Sanitaria*, 35(1), S15–S18. <https://doi.org/10.1016/j.gaceta.2020.12.005>
- Motamedzade, M., Choobineh, A., Mououdi, M. A., & Arghami, S. (2007). Ergonomic design of carpet weaving hand tools. *International Journal of Industrial Ergonomics*, 37(7), 581–587. <https://doi.org/10.1016/j.ergon.2007.03.005>
- Nejad, N. H., Mohammadian, M., Haghdooost, A. A., & Charkhloo, E. (2021). The relationship of grip and pinch strength to musculoskeletal disorders in female carpet weavers in southeastern Iran, 2019. *Indian Journal of Occupational and Environmental Medicine*, 25(3), 138–146. [https://doi.org/10.4103/ijoom.IJOEM\\_223\\_20](https://doi.org/10.4103/ijoom.IJOEM_223_20)
- Ottesen, T. D., Amick, M., Kapadia, A., Ziatyk, E. Q., Joe, J. R., Sequist, T. D., & Agarwal-Harding, K. J. (2022). The unmet need for orthopaedic services among American Indian and Alaska Native communities in the United States. *The Journal of Bone and Joint Surgery*, 104(11), e47. <https://doi.org/10.2106/JBJS.21.00512>
- Pavana, & Mica, N. (2021). Work-related musculoskeletal disorders among traditional weavers of districts of Arunachal Pradesh – A cross sectional study. *Indian Journal of Physiotherapy & Occupational Therapy*, 15(3), 71–80. <https://doi.org/10.37506/ijpot.v15i3.16165>
- Rizzo, M. (2019). Hand surgery in underserved populations in the United States: The author's experience with the Navajo at the Gallup and Chinle Indian Health Service Hospitals. *Hand Clinics*, 35(4), 441–448. <https://doi.org/10.1016/j.hcl.2019.07.014>
- Roll, S. C., & Hardison, M. E. (2017). Effectiveness of occupational therapy interventions for adults with musculoskeletal conditions of the forearm, wrist, and hand: A systematic review. *American Journal of Occupational Therapy*, 71(1), 7101180010. <https://doi.org/10.5014/ajot.2017.023234>
- White, T., & Beagan, B. L. (2020). Occupational therapy roles in an Indigenous context: An integrative review. *Canadian Journal of Occupational Therapy*, 87(3), 200–210. <https://doi.org/10.1177/0008417420924933>