Behind the Smile: Detecting Chronic Kidney Disease Through Oral Health Screenings

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The Spotlight on Nursing is a recurring column from the University of Hawai'i at Mānoa Nancy Atmospera-Walch School of Nursing (NAWSON). It is edited by Holly B. Fontenot PhD, APRN, WHNP-BC, FAAN, FNAP; Associate Dean for Research, Frances A. Matsuda Chair in Women's Health, and Professor for NAWSON, and HJH&SW Contributing Editor; and Joanne R. Loos PhD, Science Writer for NAWSON.

Acronyms

CKD = chronic kidney disease
KEDS = Kidney Early Detection Screening
NKFH= National Kidney Foundation of Hawai'i
PSR = Periodontal Screening and Recording
UHM= University of Hawai'i at Mānoa

Oral health was once thought of as a separate entity from a patient's total health status. However, research has highlighted the links between patient's oral condition and their overall health. Health practitioners recognize that the mouth is a powerful diagnostic tool in the clinical assessment of overall health and well-being.[1-2] For example, poor oral health and dentition (missing teeth, number of cavities, bad breath, gingivitis) are serious health conditions and have been associated with other chronic diseases, including early stages of chronic kidney disease (CKD).[3-4] The consequences of poor oral health may be more severe in CKD patients because of advanced age and the common comorbidities of diabetes and hypertension. [5-6] These factors relate to an increase of systemic consequences of undiagnosed, unrecognized, or untreated symptoms, such as periodontal conditions.[7] Therefore, novel interventions are needed to integrate oral health assessments into routine screening for other chronic diseases, specifically CKD.

There are an estimated 35.5 million adults (14%) in the United States living with CKD.[8] Kidney disease develops slowly and without symptoms; 1 in 9 individuals have kidney disease but are undiagnosed and under-treated.[8] Patients may have no symptoms and may not be aware of their early stages of CKD. Hawai'i's kidney failure rate is 30% higher than the national level.[9] Cross-sectional studies of community-dwelling participants in Hawai'i indicate that Native Hawaiians and Filipinos had the highest risk profiles for CKD.[10-13] Reducing these health disparities requires raising CKD awareness, providing preventive early diagnostic screening care that is culturally tailored, and removing barriers to care coordination.[14]

Inflammatory reactions are a major contributor to the development of CKD.[15] Changes in the oral cavity are common in CKD patients because of systemic consequences such as inflammation, infections, and immune dysfunction, which may contribute to increased morbidity and mortality.[3] Poor oral health and CKD are interrelated and well established in the literature.[16]

Periodontal disease may be associated with microbially triggered chronic inflammatory disease, which is a major mechanism in the development of CKD.[17] There is a close connection between renal dysfunction and poor oral health with systemic inflammatory response by oral infection, and the release of inflammatory cytokines and their mediators.[18-19] Therefore, it is likely that the inflammatory reactions caused by periodontitis or poor oral hygiene management may affect the development of CKD, and screening for oral health and kidney disease concurrently would be a preventive strategy.

In 2021, the Department of Dental Hygiene at the University of Hawai'i at Mānoa (UHM) was invited to join the National Kidney Foundation of Hawai'i (NKFH), Kidney Early Detection Screening (KEDS) program Symptom Management Think Tank for CKD. The Think Tank was composed of representatives from the NKFH, UHM dental hygiene faculty, UHM nursing faculty, and other volunteer nurse practitioners from various Hawai'i health care organizations. The objective of the Think Tank was to collaborate with nursing and dental health care professionals in the clinical setting and academia to revise the KEDS program intake form to include a periodontal health evaluation.

Oral Health Integrated into the NKFH KEDS Program

In order to address the objective of oral health, the multidisciplinary group developed a strategy for the integration of oral health screening into the statewide grassroots NKFH KEDS program. In Fall 2022, the NKFH relaunched the KEDS program on the island of O'ahu, with oral health integrated into the program. The early detection screening events were expanded from 5 to 7 stations; with inclusion of oral health. The new oral health screening included the following components: (1) a patient-report questionnaire that included a list of oral conditions, (2) an oral hygiene survey on oral hygiene habits (eg, brushing, flossing) and cultural practices for oral hygiene care (eg, chewing sticks for cleaning teeth), and (3) a dental hygiene examination using the Periodontal Screening and Recording (PSR) tool. The PSR is a screening tool and is not meant to replace a full periodontal examination.[20-21] The PSR is commonly used as a screening method for the measurement of depth of gingival sulcus and the clinical attachment level of periodontal probing. Six measurements for each tooth were obtained, utilizing a special ball-tipped probe. The probe is plastic or metal to be used to record the sextant score along with the date (month, day, year), bleeding, calculus/defective margins, and probing depth. This tool was used to record the participant's periodontal status.

Outcomes of UHM Dental Hygiene's Oral Health Screening

Oral health has been seamlessly integrated into the NKFH KEDS program. The partnership between the UHM Dental Hygiene program and the NKFH KEDS program is in the preliminary phase. To date, dental hygiene students have participated in 4 community-based screening events ranging from 50 to 74 patients per event.

Formative evaluations from students, faculty, and key leaders of the KEDS program have been instrumental to the overall success of this partnership (eg, increased partnership with the community in promoting oral health, interdisciplinary team approach to systemic health). Some participants of the overall screening events did not choose to participate in the oral health portion of the KEDS program. This could have been due to (1) backup and waiting time for dental screenings, and/or (2) participant reluctance to have their mouths examined. When there was significant backup and waiting time, many participants went on to other screening stations but did not return to the oral health station. Evaluation feedback highlighted that the backup was not from the screening process itself, but from the desire of the participant to talk to the dental hygiene students and faculty about their dental health issues. The team decided that the participants should have the time and opportunity to ask questions and receive dental health information specific to their concerns. Second, participants may have had reluctance to have dental screenings for a variety of reasons. Anecdotally, a few participants self-reported that they were uncomfortable disclosing their dental status because they were not happy with their appearance or the poor state of their dentition.

Current Developments and Future Steps

In response to some of the challenges, the team developed and piloted new methods to reduce wait times and provide additional education. First, the oral health station has volunteers to keep the screening process on track. Second, a separate oral health education table has been established. At this education table, participants may spend more time if they choose to ask questions and receive oral health information. Each participant returns home with an oral health kit complete with a toothbrush, toothpaste, and floss. A poster board with important oral health information was created by the dental hygiene students. Students also developed printed educational material for distribution to the participants. *The Chairside Instructor*,[22] a digital book of patient-oriented oral health information created by the American Dental Association was also available for participants to view on an iPad. By the comments NKFH received from participants, the oral health education table was very well received, and there are plans to have this separate substation become permanent at future screening events. Future steps include a continuous evaluation of the oral health screening process and the sustainability of maintaining the oral health station in seeking further resources and funding.

Conclusion

This successful partnership between the UHM-Dental Hygiene program and NKFH will continue to provide community outreach and service while raising awareness of oral health conditions that might be related to CKD. This is one example of a novel and collaborative partnership which benefits the community and the dental hygiene faculty and students.

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