Innovative mDentistry eHygiene pilot study showed promise in dental care

J Xiao¹, D Kopycka-Kedzierawski¹, LA Mendez Chagoya¹, K Funkhouser², T Lischka², TT Wu¹, K Fiscella¹, KS Kar¹, N Al Jallad¹, N Rashwan¹, J Ren¹, C Meyerowitz¹

¹Eastman Institute for Oral Health University of Rochester Medical Center, ²Kaiser Permanente Center for Health Research

Background

The COVID-19 pandemic presented dental healthcare professionals with challenges such as preventing crosscontamination, managing a shortage of high-level PPEs, and handling time and resources. To address these issues, the mDentistry eHygiene model (Figure 1) was developed, combining virtual dental visits with digital mobile health tools like intraoral cameras for comprehensive oral health screening, treatment planning, virtual hygiene examinations, and interactive oral health education. The mDentistry eHygiene Study was conducted to evaluate the acceptance of these virtual dental examinations by both patients and dental healthcare personnel.

Methods

• The eHygiene study was conducted with 85 patients and 18 dental health care personnel from 12 practices from the Northeastern node of the Network.

Data Collection

- The mDentistry model supplemented traditional dentistry with virtual visits supported by mobile devices and mHealth tools (See Figure 1.B)
 - **eHygiene session**: the 1st stage assessed the acceptance and barriers of the eHygiene sessions among patients and



Figure 1. Current and proposed mobile dentistry (mDent) model for dental examinations. PPE: personal protective equipment.



dental health care personnel.

- A dental hygienist took x-rays, and intraoral photos of the patients using Mouthwash Teledent. A dentist reviewed the x-rays and photos and conducted a virtual visit with the patient to review findings and treatment plans.
- **SELFIE session**: the 2nd stage assessed the patient's capability to generate intraoral images using mHealth tools.
 - Patients used intraoral cameras while being supervised by a dental hygienist to take a series of intraoral photos of the front and posterior teeth (See Figure 2).

Measures and Data Analysis

- Patients and the dental health care personnel answered a survey and were interviewed.
- Outcomes: System usability scale (SUS), dentist-patient communication, and themes of acceptance and barriers to the eHygiene and SELFIE sessions.



Figure 1.B. Specific aims, study design, and outcome measures. DPC: dentist-patient communication; SUS: System Usability Scale.

Results

- The eHygiene examination model was well-accepted by patients, with a 70.0±23.7 SUS score. A SUS score above 68 indicates above-average usability. Females reported higher SUS scores. Patients had low SUS scores when they spent more time on the virtual visit.
- The eHygiene model was moderately accepted by dentists (SUS 51.3±15.9) and hygienists (SUS 57.1±23.8). Dentists' and hygienists' SUS scores appear to be associated with a learning curve, the SUS score rated by Dentist and Hygienist increase after more patients were seen. Dentists and patients had good communication during the eHygiene examination.
- In the SELFIE session, patients could complete tasks with • minimum challenges and obtain diagnostic intraoral photos.
- Patients and dental health care personnel suggested that although eHygiene has the potential to improve oral health care services, it should be used selectively depending on patients' conditions.
- The dental health care personnel raised concerns regarding • monetary and reimbursement issues. For instance, the time required for intraoral photo capturing and virtual dental visits was not traditionally reimbursed under the current dental fee schedule.

Figure 2. Patient self-taken intraoral photos: (A) front view taken on an iPhone X, on which gingival erythema and multiple white spots (decalcification) are seen; (B) posterior photos taken with a Mouthwatch intraoral camera, where the upper panel includes photos of the lower left first molar and lower panel photos of the upper right first molar.

Conclusions

The mDentistry eHygiene model exhibited potential in the field of dental care. Dental healthcare personnel managed to carry out eHygiene sessions, albeit with moderate satisfaction and concerns about reimbursement. Patients, on the other hand, showed greater acceptance of the eHygiene session than healthcare personnel and successfully used the intraoral camera for the SELFIE session. However, additional evaluation of the model is necessary to determine its efficacy and applicability in dental practices.



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