

Oral-health and quality-of-life assessment in adult outpatients using an iPad-app

Thomas Wolf, Ines Willershausen, Pommerenke Mirko, Brita Willershausen

Department of Operative Dentistry, University Medical Center Johannes Gutenberg University, Mainz, Germany

Aim

An increasing number of physicians and researchers take advantage of smartphones or other mobile devices during their daily professional routine in order to facilitate the retrieval of medical information and to improve their patients' treatment. Mobile health apps have gained tremendous popularity; however, most of them are devoted to easing medical processes or to simplifying the patients' understanding of their diseases rather than providing a tool to actively screen patients with regard to the prevalence of a certain disease. The aim of the present study was to develop an iPad app intended for the screening of adult outpatients with regard to their oral health status and their dental treatment needs as well as their health-related quality of life and their depressive predisposition. The iPad app is also designed to facilitate data acquisition. It includes a dental examination sheet (WHO oral health questionnaire) and two patient-based questionnaires.

The objective of this study was to facilitate a screening of outpatients with regard to dental treatment, oral health-related quality life (OHIP-G14), and Beck Depression Inventory (BDI-II) as well as to test our iPad app with regard to its practicability in a clinical setting.

Materials and methods

A total of 196 healthy adult outpatients, reporting to the Department of Operative Dentistry, University Medical Center, Mainz, Germany, for check-up visits were enrolled in the study. For this investigation, an iPad app was developed with the goal of facilitating dental screenings of outpatients (Fig.1). We also wanted to facilitate the evaluation of the questionnaires by directly digitally implementing the data into an Excel sheet. We used the highly standardised WHO oral health assessment questionnaires for the acquisition of the dental parameters. All the patients were also asked to document their answers for the OHIP-G14 (scale: 0-37) and BDI-II (scale: 0-63) questionnaires directly into the iPad App.

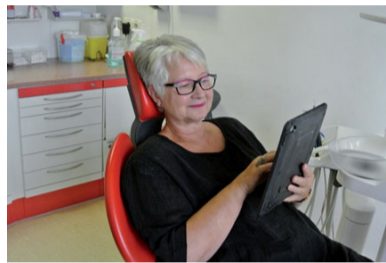


Fig.1 63-year-old female outpatient using the iPad app



Fig.2 Gingival inflammation and numerous crowns in an 53-year-old male patient



Fig.3 Pronounced dental fluorosis in an 58-year-old male patient



Fig. 4 Severe enamel and dentine erosion in a 45-year-old female patient

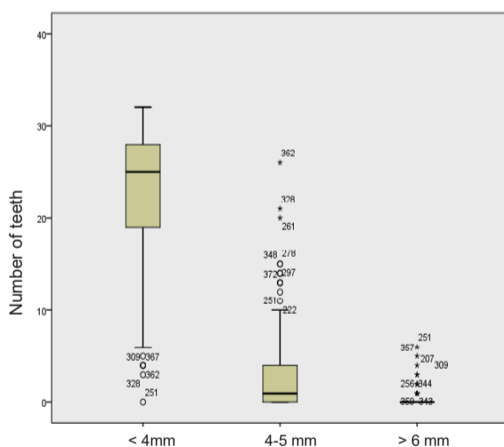


Fig 5. Distribution of pocket probing depth

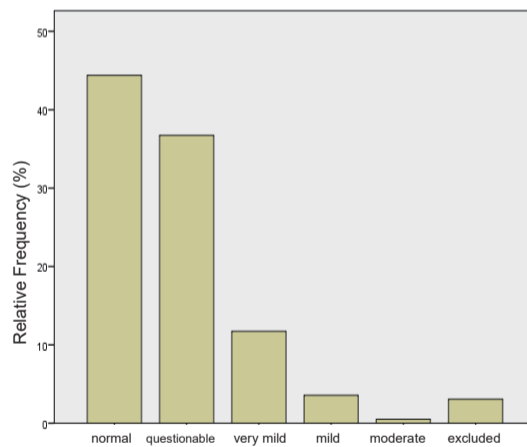


Fig.6 Distribution of fluorosis severity

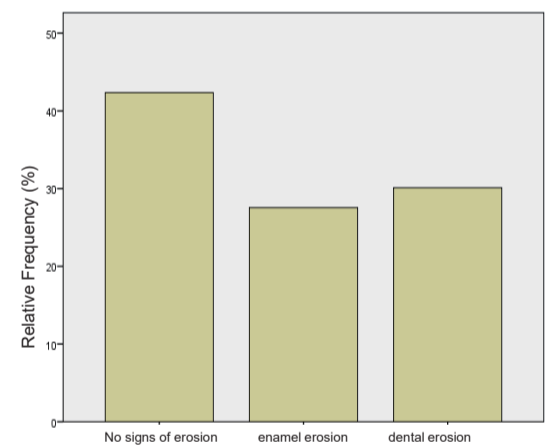


Fig. 7 Dental erosion severity

Results

This study included 94 male and 102 female patients (mean age 39.8 ± 16.9 , 18-83 years). The mean number of teeth was 26.5 ($SD \pm 3.8$). A high number of teeth showed restorations or crowns (11.1 ± 5) (Fig.2), and there were also a high number of teeth free of caries (16 ± 7.1). Less than one tooth (0.7 ± 0.9) showed primary or secondary caries. Most of the teeth (mean: 22.6 ± 7) showed a pocket depth of < 4 mm, and a marginal number (mean 3 ± 4) showed a pocket depth between 4-5 mm (Fig.5).

17.3% of the subjects were smokers, and 82.7% were non-smokers. No enamel fluorosis was detected in 47.3%, 14.5% had mild fluorosis, and 38.2% were classified as questionable (Fig.3 and 6). Enamel or dentinal erosions were observed in 39.1% (Fig.4 and 7). The BDI-II score was 4.4 ± 5 (1-44), and the OHIP-G14 score was 3.9 ± 5.8 (0-24). Mucosal lesions were detected in 10%; 87.3% were lesion-free. Treatment need was urgent in 11.8%, 49.1% required preventive or routine treatment, and no treatment was needed in 39.1% (Fig 8).

Conclusions

The investigated outpatients represent a cross-section of the oral health care situation of the German population. The data resemble the results of the DMS V recently published in Germany. The use of the novel app is well-suited for the detection of cohorts; however, some older subjects had difficulties using a tablet computer, which required extra time.

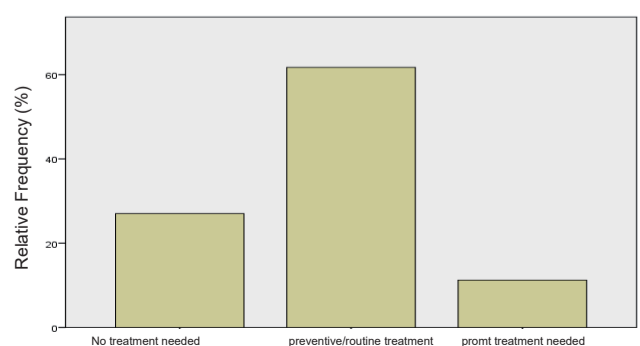


Fig. 8 Distribution of intervention urgency