Oral health and quality of life assessment in hospitalised patients using an iPad app

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Aim

An increasing number of physicians and researchers take advantage of smartphones or other mobile devices in 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 hospitalised patients with regard to their oral health status, their dental treatment needs, and 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 (Fig. 1).

The objective of this study was to facilitate a screening of hospitalised patients with regard to dental treatment (Fig. 2 and 3), oral-health-related quality of life (OHIP-G14) and Beck Depression Inventory (BDI-II) as well as to test the app with regard to its practicability in a clinical setting.
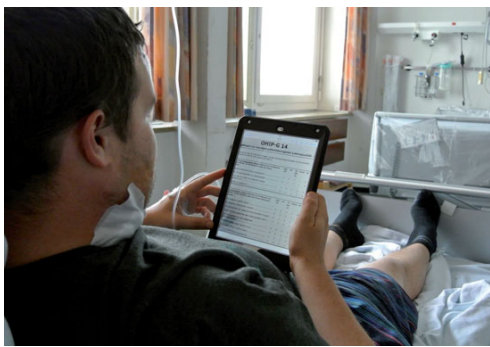

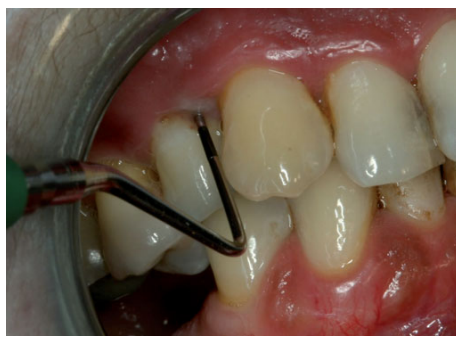Fig. 1 Hospitalized male patient using the ipad app

Fig. 2 Measuring of pocket probing depth in an 48 years old female patient

Fig. 3 Front teeth from an hospitalized 63 years old male patient with signs of erosion and oral lesions

Materials and methods

In this clinical study, a total of 145 hospitalised patients admitted to the Departments of Orthopedics and Traumatology (UC) and the Department of General Surgery (AC) at the University Medical Center of Mainz, Germany, were enrolled. For this investigation, an iPad app was developed with the goal of facilitating dental screenings of hospitalised patients (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. The patients were asked to document their answers to the OHIP-G14 (scale: 0-37) and BDI-II (Scale 0-63) questionnaires directly into the iPad app.

Results

A total of 91 male und 54 female patients with a mean age of 55.6 (SD$\pm$17) years were enrolled. The average number of teeth was 23.7 (SD$\pm$6) for the UC patients and 21.6 (SD$\pm$7) for the AC patients (Fig.4). The patients in theTraumatology Department (UC) generally showed a better oral health status with fewer signs of gingival bleeding (p=0.13; Fig.4), fewer pocket depths over 4mm (UC: 1.2; AC: 2.8) and fewer oral mucosa lesions (UC: 0.5; AC:1) than the General Surgery patients (AC). However, mucosal lesions were only found in 11.4% of all patients.

The Beck Depression score (BDI-II) showed significantly better values for the UC patients (2.9; SD$\pm$5) than for the AC patients (5.1 SD$\pm$6) (p=0.26; Fig.6). Similar observations were found for the OHIP-G14 score (UC patients 3.2$\pm$6; AC patients 5.8$\pm$8) (Fig. 7).The need for immediate dental treatment was observed in 18%; urgent problems were recorded in 14% of all cases, preventive measures were to be conducted for 31% of all patients, and no dental treatment needs were recorded for 36% of all patients.
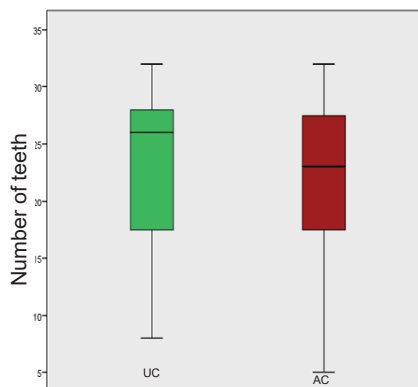

Fig.4 Total number of teeth in hospitalised patients from the Departments of Traumatology (UC) and General Surgery (AC) University Medical Center
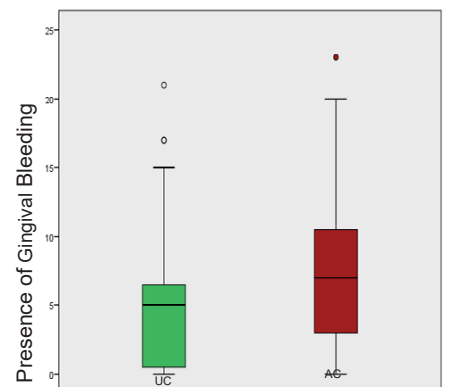

Fig.5 Presence of gingival bleeding in hospitalised patients from the Departments of Traumatology (UC) and General Surgery (AC).
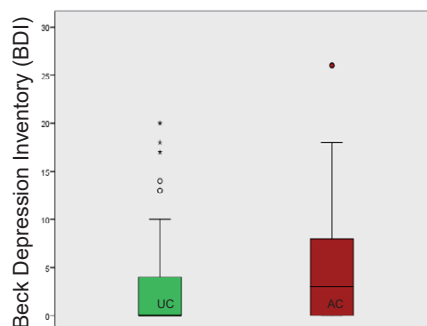

Fig.6 BDI II questionnaire in hospitalised patients from the Departments of Traumatology (UC) and General Surgery (AC)
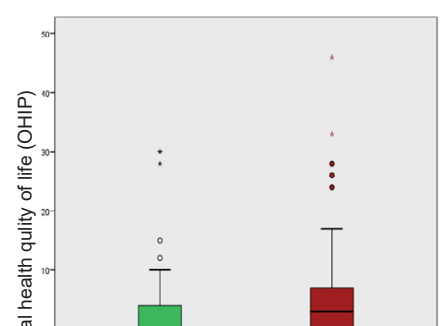

Fig.7 OHIP questionnaire in hospitalised patients from the Departments of Traumatology (UC) and General Surgery (AC)

Conclusions

Using the app is suitable for detecting cohorts in hospitalised patients. However, handling tablets proved to be difficult especially for older patients, so that additional time was necessary. A few patients refused to use the app.