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Development and feasibility testing of the smartphone-based dietary record app NutriDiary (beta version)

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Abstract

Smartphone technology has the potential to facilitate dietary assessment in epidemiological studies. Measurement error might be reduced by real time recording being more feasible with mobile methods. Our aim was to develop NutriDiary, a smartphone app for conducting three-day weighed dietary records. It provides a digital version of the established pen-and-paper method in the Dortmund Nutritional and Anthropometric Longitudinally Designed (DONALD) study, an open cohort study from infancy to adulthood. NutriDiary was developed as a text-based app including brand specific recording of food products. Usability of the beta version of NutriDiary was evaluated in the DONALD study. Participants or their parents were offered to test the app for the annual dietary record and were asked to fill in an app-integrated evaluation questionnaire. Usability was assessed by the System Usability Scale (SUS) and in-app behavior recordings. In the beta version of NutriDiary, a consumed food item is selected using a free-text search from the integrated in-house database LEBTAB. To ease the process of recording, NutriDiary offers some usability features such as a recipe editor, an integrated help mode and a photo function for collecting information on branded food products. In total, 32 mostly female participants (69%) used the app with 21 subjects recording their own dietary intake and 11 subjects conducting a record for their child. However, a relatively large proportion of DONALD participants also refused using the app because they preferred the traditional pen-and-paper method as being easier. Among participants of the feasibility study, subjective usability of NutriDiary was "good" but considerable differences in individual ratings were observed (median SUS = 80, IQR = 23.75, minimum = 45). Although 38% of participants reported technical issues, 88% stated they would use the app again. Technical problems included issues related to setting the time, editing of entered food items and the photo function. In-app behavior recordings showed that the help mode and recipe function were well-used (72% and 63%, respectively). Feedback from the study staff revealed that the post-processing of the dietary data obtained with NutriDiary was still time-consuming. Overall, the beta version of the NutriDiary app was well-received by most participants. Some aspects for improvement such as a barcode scanning function and extension of the database were identified. Moreover, NutriDiary will be further optimized by implementing an automated recipe simulation function.

Conflict of Interest

There is no conflict of interest.