

Abstract

Introduction: The prevalence of type 2 diabetes is increasing in epidemic proportions, especially in low- and middle-income countries. There is an urgent need for new methods to address the increasing incidence of type 2 diabetes. Controlling food intake is important in type 2 diabetics, which also helps in weight loss. Digital applications can be very beneficial when it comes to monitoring food intake and can also provide feedback on energy and nutritional value. The ubiquity of mobile phone use and Internet access makes mHealth technology a viable tool and aid in mode prevention and management in type 2 DM.

Objective: The aim of the research was: (1) to determine whether nutritional intervention through digital applications makes sense; (2) to determine whether we can determine weight reduction based on subjective evaluation; and (3) to determine whether the recalculation of the menu in this study is necessary.

Methods: This work was like a retrospective study. The data were obtained through the Vitadio Health program, which lasts 12 months, but in our research, the first 3 months, which indicate an intensive phase, were evaluated. A total of 473 photos from 22 users (15 men, 7 women) were obtained and analyzed. 3 consecutive entry/exit days were selected from the available menu entries. The following data from Vitadio Health pilot study participants were used: age, height, baseline weight, weight at 3 months, baseline BMI, BMI at 3 months. Total energy, carbohydrate, protein, fat, fiber, and carbohydrate/fiber ratio were evaluated. Meals were scored 1-5, with 1 representing the best and 5 the worst. Photos of dishes were evaluated using Microsoft Excel, where they were processed into graphs (correlation graphs were processed using R Software) and tables. The data were tested for normality using the Shapiro-Wilk test and then the corresponding statistical test (paired t-test, Wilcoxon paired test) was used. The correlation was evaluated using Pearson's correlation coefficient. All statistical assumptions were evaluated at a 5% level of significance. The given meals were recalculated using the Calories Table application.

Results: Nutritional intervention in a digital environment led to a decrease in the energy value of food by 148 kJ ($p = 0.02$), daily dietary fat intake by 14.4 g / day ($p = 0.001$) in patients with type 2 DM. Patients enrolled fewer daily meals before the intervention than after the intervention (3.76 ± 0.8 vs 3.3 ± 0.53 ; $p = 0.01$). However, the relationship between the number of daily meals and weight reduction was not confirmed, ie patients who included

more daily meals did not reduce more bodyweight ($r = - 0.03$; $p = 0.89$). Fat intake, although through a nutritional intervention there was a significant decrease in its daily intake (before 51.1 ± 19.2 g; after 36.7 ± 11.0 g; $p = 0.001$), did not correlate with the rate of weight reduction ($r = - 0.06$, $p = 0.77$). An interesting finding was that patients consumed, although not significantly, more fiber in the pre-nutritional intervention period (12.71 g vs 11.6 g $p = 0.2$). The carbohydrate: fiber ratio was more favorable in the post-nutritional intervention period (16.5 vs 14.6) because the difference was not significantly significant ($p = 0.44$) and post-intervention fiber intake was also related to the rate of weight reduction ($p = <0, 0001$). According to our results, this cannot be said for carbohydrate intake ($p = 0.52$). Subjective food evaluation (SHP) on a scale of 1-5 (school grade) by a nutritionist (NT) predicted success in weight reduction. The better the NT rating, the higher the rate of weight reduction in kg ($r = 0.58$; $p = 0.005$) and the more favorable the carbohydrate: fiber ratio ($r = 0.6$; $p = 0.003$). On the contrary, SHP did not predict lower fat consumption, i.e. the value of SHP was in no way related to the amount of fat consumed.

Conclusion: Nutritional therapy through digital applications in our research set made sense. The results valid for our group confirm that it is not necessary to recalculate the energy values from the diet record through the photograph to assess whether such a diet will lead to a reduction in body weight / BMI, but comparable results can be achieved by evaluating the meal through quality. qualified assessment of food photography by a nutritional therapist. However, there were also certain limits in the work, such as illegibility or distortion of photography. Therefore, further studies are needed to examine the area in nutritional therapy and digital applications.

Key words:

diabetes mellitus, modern applications of diabetology, online applications in nutritional therapy