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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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EFFICIENCY OF MOBILE APPS FOR SELF-MANAGEMENT IN TYPE II DIABETES: (REVIEW)

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Abstract.

Diabetes affects millions of patients worldwide. Despite huge improvements in diabetes pharmacotherapy, innovations in glucose diagnosis and monitoring, and the use of insulin pumps, many people with diabetes are not meeting their glycemic control targets and would benefit from greater flexibility and more individualized diabetes management. All guidelines for the management of type II diabetes mellitus focus on lifestyle changes and self-management. Self-management includes changing eating habits and increasing physical activity. Nowadays, computer and mobile applications are increasingly convenient and widespread tools for self-help, their functions include glycemic control, adapted diets, and educational materials about the disease. Users can be not only patients but also medical personnel.

Mobile apps can help people manage their health and well-being, promote healthy lifestyles, and access useful information whenever and wherever they need it. These tools are being implemented almost as quickly as they are being developed. Experts estimate that in 2017, for example, there were 325,000 medical applications available on smartphones, which corresponds to 3.7 billion downloads of mobile medical applications by smartphone users worldwide.

The article presents an overview of the effectiveness of electronic devices, programs, and applications for smartphones for the self-management of patients with type II diabetes.

Key words. Type II diabetes, diet, Lifestyle, digital instrument, smartphone apps.

Introduction.

According to the International Diabetes Federation, type II diabetes is the most common type of diabetes, accounting for about 90% of all cases of diabetes. The overall prevalence of diabetes among adults in 2021 was estimated at 10.5% (536.6 million people) and was predicted to increase to 12.2% (783.2 million people) in 2045 [1]. The cornerstone of treatment for type II diabetes is behavioral factors such as diet and exercise. Insufficient time for effective individual work for nutrition correction with each patient can be solved by modern digital technologies for personalized medicine, which include computer programs and applications for smartphones. These programs and mobile apps for diabetes differ in the range of features they provide. There are simple applications with a set of educational information for patients that do not require daily interaction to improve health. Along with them, most applications allow the patient to enter glucometer or nutrition data and save this data for later consultation with a doctor, a feature of some applications is the ability to pair with a glucometer and automatically copy the glucometer data to the application. Also, some applications have functions for calculating the value of glycated hemoglobin and the bolus of insulin that should be administered to the patient. Also interesting is the calculation of bread units in insulin-dependent patients, a reminder, and the volume of physical exercises. Computer programs allow you to calculate the necessary physical activity and, most importantly, to calculate an individual diet [2-5].

Recently, the use of mHealth apps for diabetes has increased from 6.7 million times in 2015 to 46.3 million times in 2019, representing approximately 11% of patients diagnosed with diabetes worldwide in 2019. Of the installed mobile apps for health, 35.8% target T1DM, 47.6% T2DM, and 32.0% GDM.29 [6-8].

Based on the available studies, the effectiveness of programs and applications is not always clear-cut. It should be noted that not all patients have sufficient literacy and commitment to the use of these tools [9]. According to patients, using a digital diabetes diary requires hard work, but not more than the effort associated with maintaining a healthy lifestyle and more controlled blood glucose levels. Support from medical staff with knowledge of diabetes is needed to confirm decisions made based on the use of the application and receive additional support for self-management [10].

Materials and methods.

Design: A literature review was conducted of published primary randomized and controlled trials reporting digital tools and mobile apps to support the self-management of DM.

Search strategy: We searched PubMed databases using a combination of medical subject headings (MeSH) and free text to cover search terms. Literature searches were conducted between September 2021 and September 2022. The search was limited to human studies in the last 5 years.

Inclusion Criteria:

Original studies were included that reported on qualitative and quantitative studies of digital tools (web technologies, telemedicine, and smartphone applications) aimed at supporting diet and lifestyle for patients with type II diabetes.

Inclusion criteria included studies in which:

Diabetic patients used digital tools to manage diet and lifestyle in type II diabetes

Exclusion Criteria:

Exclusion criteria were studies in which:

Patients without type II diabetes.

Digital tools that did not include dietary and physical activity recommendations.

Abstracts and unpublished studies were not included in this review.

Results.

Study selection.

An initial search revealed 14 titles and abstracts. After reviewing the title and abstract, the full texts of 10 potentially relevant articles were extracted for further study, and their links were manually checked to identify articles not included in the original search. However, no additional articles were received in a result of this process.

Results.

Most of the studies included small samples. The sample sizes of the selected studies ranged from 20 to 305 subjects/treatment or control, with 1 research (10%) containing no groups of more than 30 subjects/group, 2 pieces of research (20%) containing 30–60 subjects/group, and 8 pieces of research (80%) with >60 subjects per group. All studies (8%) involved women and men.

It is noteworthy that the prevalence of the use of mobile applications affecting nutrition and other indicators is growing, as shown by a recent survey of 217 respondents with type I diabetes (38.25%) and type II diabetes (61.8%), from 4 continents (Australia, Europe, Asia, and America). It turned out that about half of the respondents (48%) use applications, mainly with the functions of tracking blood glucose (56.6%), blood pressure (51.9%), and food calories (48.1%). In the future, patients would like to see a reflection of the nutritional values of foods (56.7%), blood glucose levels (54.8%), exercise tracking (47%), health data analytics (42.9%), and self-management training for diabetes (40.6%) [11]. These data indicate that the use of applications will become significant in changing the behavioral factors of patients with diabetes due to their wide availability and convenience. Several types of research confirm the effectiveness of mHealth in patients with type II diabetes in terms of nutrition, exercise, and glycemic parameters [12].

Thus, a randomized trial conducted in Singapore demonstrated a decrease in glycated hemoglobin in the intervention group - 99 people compared to the control group, as well as a decrease in weight and energy intake, however, interventions using a mobile application were available to young people and who spoke English and were excluded patients with depression, which reduced sample representativeness Smartphone use resulted in greater reductions in HbA1c among participants with an HbA1c level of 8% or higher Between-group differences in favor of intervention were also noted for fasting blood glucose, diastolic blood pressure, and dietary changes [13].

Chinese authors in a study on the efficacy and safety of lifestyle interventions in elderly patients with type II diabetes mellitus through a mobile application showed that after 3 months, patients in the intervention group experienced a significant improvement in postprandial plasma glucose levels. After 6 months, patients in the intervention group tended to decrease in postprandial plasma glucose and glycated hemoglobin levels compared with baseline and those in the control group [14].

Participants in another web-based lifestyle intervention for adults with type II diabetes achieved significantly greater weight loss compared to conventional care. Patients had access to a fully automated ANODE program to improve their lifestyles. They were given a personalized menu and shopping list for the day or week and were assigned physical activities. Body weight, waist circumference, and HbA1c changes improved significantly during the intervention. The use of the app resulted in a significant improvement in dietary habits [15].

The "DhealthBar" application in 96 participants in China also demonstrated an improvement in carbohydrate metabolism during a 6-month intervention [16].

An interesting study examined the feasibility and potential efficacy of remotely supported intermittent low-energy diets and continuous low-energy diets in people with type II diabetes. Both groups received support by phone or through the Oviva app. A decrease in HbA1c was achieved in 42% of both groups, indicating the effectiveness of the diet and dietary support through mobile interventions [17]

Indian authors gave patients with type II diabetes and obesity an app that tracked their weight, physical activity, and diet, as well as 12 weekly DM2 prevention video lessons and coach calls, while the control group received routine care. The intervention group experienced significant weight loss per 1 kg, while the control group lost 0.3 kg. More people in the intervention group (n = 139.15%) achieved the target of 5% weight loss than in the control group (n = 131.9%). In addition, interestingly, within the intervention group, those who watched the video lost more weight (2.4 kg) than those who only attended the trainer's calls (0.9 kg) [18].

A 26-week randomized, controlled, open study provided 234 patients with self-monitoring of blood glucose levels with automatic transmission of data on glucose, diet, and physical activity recommendations - the iCareD system. HbA 1c change, diabetes-related self-efficacy, self-care activities, and satisfaction with the iCareD system were assessed. The use of an electronic application in self-help for diabetes has shown short-term effectiveness in glycemic control, and this effect decreased over time. Participants felt comfortable using the iCareD system and demonstrated high adherence [19].

Thirteen primary care clinics in Seoul and other major cities in South Korea volunteered to participate in a multicenter, clustered, randomized, controlled, open study. Overall, 150 (9 clinics) and 97 (4 clinics) participants with T2DM were assigned to intervention and control groups, respectively. Each month, participants in both groups attended face-to-face consultations with doctors for diabetes treatment at the clinic. In the intervention group, participants had to upload their daily self-monitoring blood glucose results using a mobile phone app in addition to 3 months of outpatient treatment. The study found that a mobile phone glucose monitoring and feedback system was effective in glycemic control when used in a primary health care clinic setting [20].

In a recent study of 20 patients with type II diabetes, each participant interacted with an app called capABILITY. CapABILITY and related trigger (text) messages have integrated the components of social cognitive theory and persuasion technology into the structure of interactive communication in the healthcare sector. In this in-subject design, participants interacted with the capABILITY app and received (or did not receive) text messages in alternative blocks. The results of the study showed statistical significance for 3 of the 7 measures

of the health study (general diet, exercise, and blood glucose levels) [21].

However, we found a multicenter pragmatic randomized controlled trial with 110 participants. In the conclusions, the authors indicated that they found no difference between the intervention and control groups in the primary clinical outcome of glycemic control as measured by HbA 1c levels. Even though participants did not use the app much, contextual factors had a significant impact on overall usage. There was no effect of the intervention on secondary outcomes measuring diabetes self-efficacy, quality of life, and healthcare use behavior. However, it was found that each additional day of app use was associated with a 0.016-point decrease in the participants' 3-month HbA 1c score. Site members logged into the app for an average of 36 days over a 14-week period [22].

Discussion.

Our review shows that the majority of mHealth interventions have focused on improving eating behaviors, including diet and physical activity, and this is particularly important for the management of obesity in patients with type II diabetes. The effects of mHealth interventions are not uniform across studies, which may in part be due to different targets and measured outcomes. The selected studies assessed a wide range of health outcomes, although most studies focused on only one or two outcomes. The primary and direct results were weight loss and the control and reduction of blood glucose and HbA1c levels. The most important secondary outcomes of both types of studies were health habits such as physical activity and diet. Despite the limitations of the 10 studies, such as the short duration of the intervention, more than 9 studies reported some desirable beneficial effects on obesity and diabetes control. This makes it possible to conduct more detailed and long-term studies. More objective and accurate measurements of behavioral change are needed in future studies. The effectiveness of mobile interventions should be interpreted with caution, as all the studies reviewed had a limited number of participants and a short duration. The intervention period in more than half of the studies was <6 months. Despite these limitations, this study provides a broad overview of mHealth applications for obesity and diabetes and sheds light on future research in patients with type II diabetes.

Conclusion.

In conclusion, it should be noted that an increasing number of studies are devoted to the study of mHealth interventions for the management and treatment of diabetes in different countries, and there are no data on studies in Kazakhstan, which makes this problem relevant for our region, although there are many patients with diabetes and problems with behavioral therapy exist. Therefore, mobile technology is a promising means of promoting behavior change among patients with chronic diseases by providing them with health information and timely suggestions for improving health behavior, in particular weight loss and normalization of glycemia.

Compliance with ethical standards.

The local ethical commission of the Non-Profit Joint-Stock Company West Kazakhstan Medical University named after Marat Ospanov (Aktobe, Kazakhstan) approved the study, application No. 42 dated November 19, 2021.

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