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HEALTH TECHNOLOGIES IN THE MANAGEMENT OF OBESITY
TECNOLOGIAS EM SAÚDE NO MANEJO DA OBESIDADE
TECNOLOGÍAS SANITARIAS EN EL MANEJO DE LA OBESIDAD

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ABSTRACT

Objective*:** to identify the scientific production on the health technologies used and their effects on the management of obesity. ***Method*:** it is a bibliographical, descriptive, integrative review type study, resulting from searches in the MEDLINE, LILACS and BDENF databases between 2015 and 2020. The descriptive analysis of the results was carried out based on the data, with a reflective and detailed reading. ***Results*:** 21 articles describing health technologies for the management of obesity were included. Dietary and pharmacological interventions were used with the support of mobile technology, among which the use of text messages, phone calls, and mobile applications were highlighted. As for the effect of the use of these technologies, there was a greater adherence to physical activity, to the replacement of caloric diets, and to the control of the various anthropometric indices, including the weight of overweight and obese patients. ***Conclusion: with the use of these technologies in the management of obesity, there was improvement in the control of the disease, in the social relationship among patients, and in the dissemination of knowledge among users.

Descriptors: Obesity; Obesity Management; Health Technologies; Review; Health Education; Health Promotion.

RESUMO

Objetivo: identificar a produção científica sobre as tecnologias em saúde utilizadas e seus efeitos no controle da obesidade. Método: trata-se de um estudo bibliográfico, descritivo, tipo revisão integrativa, a partir das buscas nas bases de dados MEDLINE, LILACS e BDENF entre 2015 e 2020. Procedeu-se à análise descritiva dos resultados a partir dos dados, com leitura reflexiva e criteriosa. Resultados: incluíram-se 21 artigos que descreviam as tecnologias em saúde voltadas para o manejo da obesidade. Utilizaram-se intervenções alimentares e farmacológicas com o auxílio da tecnologia móvel, dentre as quais destacaram-se o uso de mensagens de texto, ligações e aplicativos móveis. Quanto ao efeito do uso dessas tecnologias, houve maior adesão à prática da atividade física, à substituição de dietas calóricas e ao controle dos variados índices

antropométricos, incluindo o peso de pacientes com sobrepeso e obesos. Conclusão: através do uso dessas tecnologias no manejo da obesidade, houve melhora no controle da doença, na relação social entre pacientes, além da disseminação de conhecimento entre os usuários.

***Descritores*:** Obesidade; Manejo da Obesidade; Tecnologias em Saúde; Revisão; Educação em Saúde; Promoção da Saúde.

RESUMEN

Objetivo: identificar la producción científica sobre las tecnologías sanitarias utilizadas y sus efectos en el control de la obesidad. Método: se trata de un estudio bibliográfico, descriptivo, tipo revisión integradora, basado en búsquedas en las bases de datos MEDLINE, LILACS e BDENF entre 2015 y 2020. Se realizó un análisis descriptivo de los resultados de los datos, con lectura reflexiva y juiciosa. Resultados: se incluyeron 21 artículos que describían tecnologías sanitarias enfocadas al manejo de la obesidad. Se utilizaron intervenciones alimentarias y farmacológicas con ayuda de la tecnología móvil, entre las cuales se destacó el uso de mensajes de texto, llamadas y aplicaciones móviles. En cuanto al efecto del uso de estas tecnologías, hubo mayor adherencia a la práctica de actividad física, el reemplazo de dietas calóricas y el control de los diversos índices antropométricos, incluyendo el peso de los pacientes con sobrepeso y obesidad. Conclusión: mediante el uso de estas tecnologías en el manejo de la obesidad, se logró una mejora en el control de la enfermedad, en la relación social entre pacientes, además de la difusión del conocimiento entre los usuarios.

***Descriptores*:** Obesidad; Manejo de la Obesidad; Tecnologías de la Salud; Revisión; Educación en Salud; Promoción de la Salud.

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INTRODUCTION

Obesity is known to be a chronic and multifactorial disease characterized by the accumulation of body fat in the individual, being closely linked to a chronic imbalance between the levels of energy absorbed and spent in the body. This imbalance stems, in turn, from factors related to lifestyle, to neuroendocrine, socioeconomic, environmental, metabolic and emotional changes, which emphasizes the complexity of its etiology.[1]

According to the World Health Organization (WHO), obesity is considered one of the greatest public health problems in the world, consisting of the second most important risk factor for the increase in morbidity for Chronic Non-Communicable Diseases (CNCDs), such as cardiovascular diseases, diabetes, and hypertension.[2] According to data from the Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Inquiry (VIGITEL) survey, the obesity rate in the country increased from 11.8% to 19.8% between 2006 and 2018, with a high rate in the age groups between 25 and 34 and 55 and 64 years old, as well as with lower education levels.[3]

In view of this, studies indicate that obesity has been growing, which can be explained by the frequent adaptation to the modern globalized world with greater consumption of processed foods, fast meals, less time for physical activity, as well as the disparity of existing social inequalities, especially in underdeveloped countries, becoming a problem increasingly associated with poverty due to limited information and the consumption of cheaper and caloric foods, thus hindering access to food that is considered healthy.[4]

Given the complexity of obesity and its high prevalence in today's world, the search for favorable conditions of easy applicability and eligible treatment has been gaining space in the world of health technologies, since the treatment for obesity is one that must be multiprofessional and interdisciplinary.[5] The following are considered health technology: medications; technical equipment and procedures; organizational, informational, educational and support systems; health care programs and protocols, by means of which health care attention is delivered to the population.[6]

Thus, the use of health technology applications can be observed to be growing as they allow remote support to patients, such as self-protection and health care management. In this context, the following question arises: "What are the health technologies used and their effects on obesity management?".

The theme becomes important once delimiting the technologies employed in the management of obesity by health professionals can be an indication of which strategies are most effective in the care provided to the obese individual.

OBJECTIVE

To identify the scientific production on the health technologies used and their effects on obesity management.

METHOD

This is a bibliographic, descriptive, integrative literature review study, developed based on the following steps: elaboration of the guiding question; literature search or sampling; data collection; critical analysis of the included studies; discussion of the results; and presentation of the integrative review.[7]

The integrative review, in turn, aims to gather and synthesize survey results on a given theme or issue, allowing the pooling of evidence in clinical practice, being the broadest methodological approach to reviews, with the inclusion of experimental and non-experimental studies for a complete overview of the analyzed phenomenon.[8]

This review was based on the following guiding question: "What are the health technologies used and their effects on obesity management?". As a research strategy, writers and keywords were used following the terminology of the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH) which were cross-referenced with the boolean marker "*and*", the following search strategy being employed: health technology *and* obesity *and* obesity management.

Therefore, throughout the month of April 2020, a search was conducted in the scientific literature in the following databases: Medical Literature Analysis and Retrieval System Online (MEDLINE), Latin American and Caribbean Health Sciences Literature (LILACS), and Nursing Database (BDENF), via the Virtual Health Library (VHL).

The criteria for inclusion of articles in the sample were defined as: original articles in full, available in the selected databases in Portuguese, English, and Spanish, published between 2015 and 2020, which answered the guiding question. The following were excluded from the study: monographs, dissertations, theses, books, review articles, non-scientific materials, articles that were not related to the theme, and articles duplicated in more than one database.

In order to evaluate the results, the articles were classified into seven levels of evidence: Level 1- Systematic review or meta-analysis of all relevant randomized controlled clinical trials; Level 2 - Well-designed randomized controlled trial; Level 3 - Well-designed non-randomized clinical trials; Level 4 - Well-designed cohort and case-control studies; Level 5 - Systematic review of descriptive

and qualitative studies; Level 6 - Descriptive or qualitative study; Level 7 - Opinion of authorities and/or report of expert committees.[9]

The results of the publications presented by the original authors were analyzed descriptively by two reviewers and interpreted based on the literature associated with the study topic. The synthesis of knowledge is presented in the discussion and results sections. It should be emphasized that the researchers' original ideas were maintained.

RESULTS

A total of 490 records were identified in the databases and 47 articles were chosen for full analysis, 21 of which were selected to compose the review. To organize and present the summary of the selection of studies, the *Preferred Reporting Items for Systematic review and Meta-Analysis Protocols* (PRISMA)[10] flowchart model was used, as shown in figure 1.

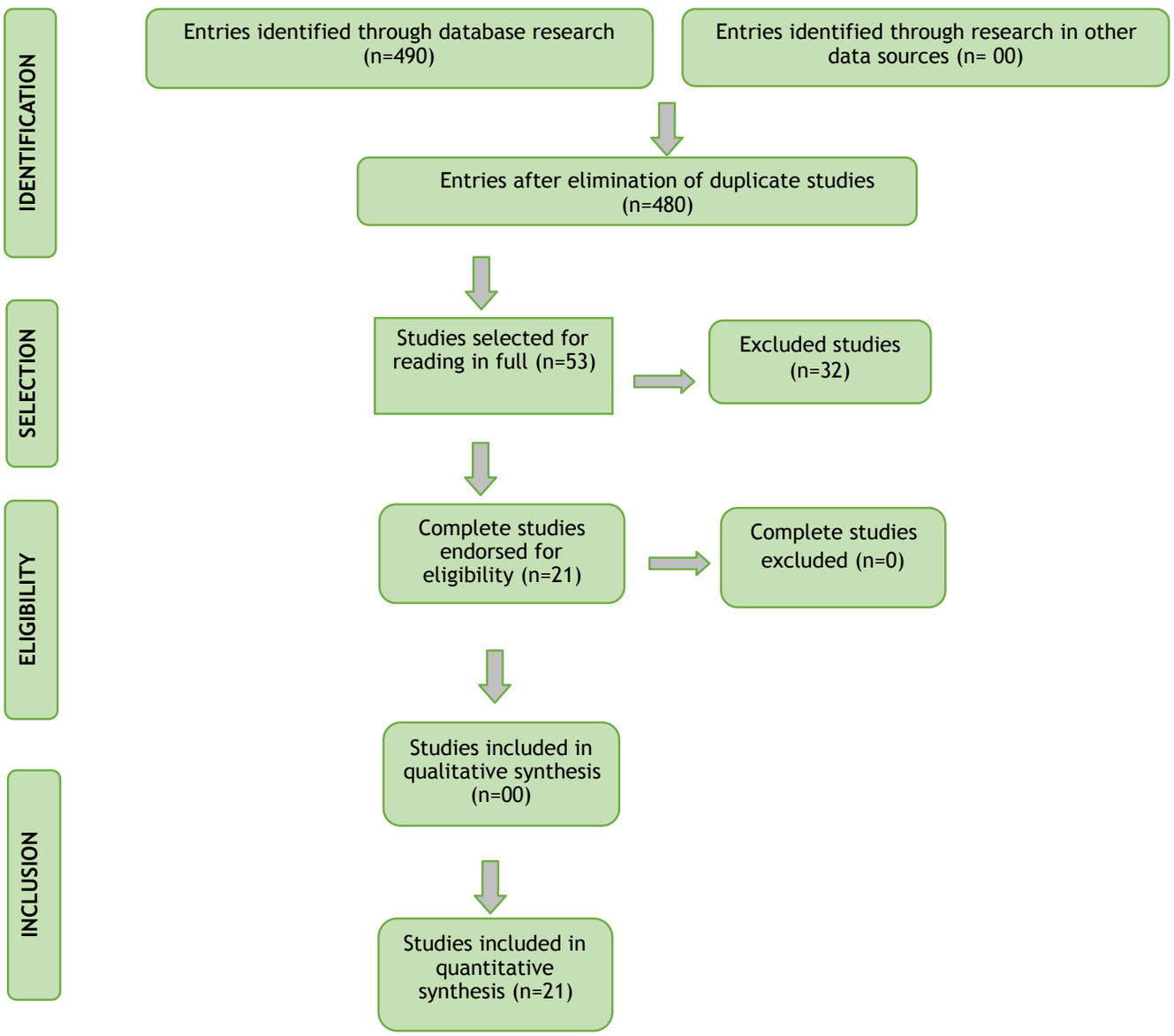

Figure 1. Study selection flowchart adapted from *Preferred Reporting Items for Systematic review and Meta-Analysis Protocols* (PRISMA 2009). Picos (PI), Brazil, 2020.

According to the selection, 21 articles that addressed the use of health technologies in the management of obesity were obtained. As for the characterization of the studies, diversity was identified regarding the methodological design, level of evidence, objective, and countries in which they were conducted. These characteristics are shown in figure 2.

Author/Year/Country	Design	Evidence Level	Objective
Holt, Gossage-Worrall, Hind, Bradburn, McCrone, Morris, et al. 2019.[11] England	Randomized controlled study	II	To evaluate whether "STEPWISE", a group-structured, theory-based lifestyle education program, could support weight reduction in people with schizophrenia.
Dean, Griffith, McKissic, Cornish, Johnson-Lawrence. 2018.[12] USA	Experimental Study	III	To evaluate the feasibility and acceptability of exercise-teaching sessions in small groups, text messaging (SMS), and a wearable physical activity tracker to increase physical activity and improve health outcomes.
Vigilone, Bouwman, Rahman, Fang, Beasley, Sherman, et al. 2019.[13] USA	Randomized controlled study	II	To determine the feasibility and acceptability of the "Goals for Eating and Change (GEM)" intervention when compared to the Enhanced Usual Care (EUC).
Shirin, Richter, Matalon, Abramowich, Maliar, Shachar, et al. 2019.[14] Israel	Experimental Study	III	To examine the safety, tolerability and effectiveness of a biodegradable encapsulated EPITOMEE weight-loss device.
Jakicic, Davis, Rogers, King, Marcus, Helsel, et al. 2016.[15] USA	Randomized controlled study	II	To examine whether adding wearable technology to a behavioral intervention would improve weight loss over 24 months among 18- to 35-year-olds.
Chen, Guedes, Cooper, Lung. 2017.[16] USA	Randomized controlled study	II	To measure the effects of an innovative mobile phone technology-based intervention for overweight and obese adolescents, and to examine the feasibility of the intervention for use in primary care clinics.
Haas, Hayoz, Maurer-Wiesner. 2019.[17] Switzerland	Experimental Study	III	To evaluate the effectiveness and feasibility of weight loss counseling using the OVIVA mobile application for overweight or obese adults.
Han, Cho, Kwon, Son, Lee, Lee, et al. 2019.[18] South Korea	Experimental Study	III	To develop and verify an integrated, personalized weight management program based on a mobile technology called Health-On, optimized for the workplace.
McRobbie, Hajek, Peerbux, Kahan, Eldridge, Trépel, et al. 2019.[19] United Kingdom	Randomized controlled study	II	To determine the clinical and cost-effectiveness of reaching a disadvantaged population with a task-based intervention in a multimodal group (Weight Action Program).
Feijão, Ingersoll, Powell, Stern, Evans, Wickham, et al. 2018.[20] USA	Randomized controlled study	II	To examine the three- and six-month effects of a Motivational Interviewing (MI) score on dietary intake, physical activity, and Body Mass Index (BMI) - z-score.
Gray, Wyke, Zhang, Anderson, Barry, Boyer, et al. 2018.[21] United Kingdom	Cohort study	IV	To investigate the long-term maintenance of weight loss, behavioral outcomes and cost-effectiveness following the "Football Fans in Training (FFIT) program".
Parks, Moore, Li, Bishop-Gilyard, Garrett, Colina, et al. 2018.[22] USA	Experimental Study	III	To examine the feasibility of using private social media groups along with traditional weight management to promote engagement in obesity treatment and reduce attrition rates in adolescents with severe obesity.
Thomas, Raynor, Bond, Luke, Cardoso, Wojtanowski, et al. 2017.[23] USA	Randomized controlled study	II	To evaluate the effects of the Weight Watchers On-line (WWO) program, with and without providing a smart scale, with weighing instructions, personalized daily and weekly feedback on weight loss, as well as frequent self-monitoring of body weight.

Young, Cohen, Goldberg, Hellemann, Kreyenbuhl, Niv, et al. 2017.[24] USA	Randomized controlled study	II	To determine whether computerized weight management provision with peer-coaching could be more effective than face-to-face delivery or the usual care, and whether it would be feasible and acceptable to patients.
Kalantari, Mohammadi, Rafieifar, Eini-Zinab, Aminifard, Malmir, et al. 2017.[25] Iran	Randomized controlled study	II	To implement a comprehensive health promotion intervention and evaluate the effects on different anthropometric indices in adolescents of 12 to 16 years of age.
Shih, Chen, Hsiao, Liu, Li. 2019.[26] China	Randomized controlled study	II	To evaluate the effects of a WSP-MR formula on body weight management in white-collar workers.
Rogers, Lang, Gibbs, Davis, Burke, Kovacs, et al. 2016.[27] USA	Randomized controlled study	II	To compare a face-to-face group-based behavioral weight loss intervention to technology-supported interventions in adults with obesity.
Lightowler, Schweitzer, Theis, Henry. 2019.[28] United Kingdom	Randomized controlled study	II	To evaluate the effects of a reduced energy diet containing isomaltulose (ISO) versus sucrose (SUC) on body weight loss.
Melchart, Low, Wurh, Kehl, Weidenhammer. 2017.[29] Germany	Randomized controlled study	II	To examine whether the HCI intervention strategy is superior to a control condition in which there is usual care regarding weight reduction at month 12 in people with overweight or grade I obesity.
Willis, Szabo-Reed, Ptomey, Steger, Honas, Al-Hihi, et al. 2017.[30] USA	Randomized controlled study	II	To evaluate the feasibility and effectiveness of using social media to deliver a weight loss program.
Hernández- Reyes A, Cámara- Martos F, Recio GM, Molina- Luque R, Romero- Saldanã M, Rojas RM, 2020.[31] Spain	Randomized controlled study	II	To evaluate the effectiveness of push notifications in an intervention aimed at improving the body composition of overweight or obese adult women through a dietary procedure.

Figure 2. Results found in the studies according to author/year/country, design, evidence level and objective of the studies. Picos (PI), Brazil, 2020.

Based on figure 2, the diversity of publications was verified in terms of methodological design. The research showed high impact designs, since most (70%) were randomized controlled studies in search of effective technologies in the management of obesity and, as for the country of origin, almost half of the studies (47%) were conducted in the United States of America (USA).

Figure 3 shows the health technologies used in the management of obesity.

Implemented health technology	Main results
Structured education lifestyle program: STEPWISE.[11]	After 12 months, weight reduction did not differ among the groups (mean difference 0.0 kg, 95% CI - 1.6 to 1.7, P= 0.963). There was no behavioral change supported in diet and physical activity necessary to promote weight loss.
Men in Motion Program - Nashville.[12]	Significant increases in self-reported levels of light, moderate, vigorous, and sport-related physical activity, as well as cholesterol and high-density lipoprotein levels and a significant reduction in weight ($p< 0.05$) and body fat (mean 1.2%) between baseline and final assessment ($p< 0.05$).
Health Training Intervention: Goals for Eating and Moving (GEM).[13]	The technology employed was cell phone counseling, as it may be more effective than direct personal counseling. There were no statistically significant differences in changes in diet and physical activity between the two groups. The GEM participants tended to lose more weight at 3, 6, and 12 months of the intervention when compared to the EUC.
Pharmaceutical Polymers: Encapsulated biodegradable EPITOMEE device and lifestyle counseling.[14]	Those who completed the 12 weeks as proposed by the study using the EPITOMEE device along with lifestyle counseling showed clinically significant weight loss (≥ 5%). There were no serious adverse effects related to the device.

IDEA Project (Innovative Approaches for Diet, Exercise, and Activity).[15]	The group using the wearable technology (EWLI) was less effective in weight loss as opposed to the standard behavioral intervention (SBWI), in which there was a mean weight loss of 5.9 kg at month 24 of the intervention, resulting in 2.4 kg smaller weight loss in the the EWLI in comparison to the SBWI (p=0.002). It is noteworthy that there were no significant differences for physical activity and food intake between the groups.
Mobile Telephone Technology.[16]	Adolescents in the mobile phone intervention group demonstrated an increase in physical activity and fruit and vegetable consumption, as well as a decrease in BMI, in the diastolic blood pressure, in TV and computer viewing time, and in the consumption of soft drinks and sugary beverages.
Mobile phone-based program.[17]	This intervention showed that the BMI dropped significantly (p< 0.001). Overall, 58% of the participants achieved a weight loss of 5% or more in relation to their initial weight. There was also a significant reduction in food intake, improving toward a healthier diet at both months 0 to 3 and 0 to 12 (p<0.001).
Mobile phone-based program.[18]	There were changes in the anthropometric and metabolic profiles between pre- and post-intervention, when the mean body weight was reduced by 5.8%. The weight median, waist circumference, BMI, lean body mass, and body fat percentage also improved significantly.
Weight Action Program.[19]	The intervention group (WAP) generated greater weight loss (4.2 kg, SD= 7.3) than the control group (PNI) (2.3 kg, SD= 6.6). Physical activity levels in both groups increased, with the WAP group showing a marginally greater increase (p =0,18).
Motivational Interviewing.[20]	Participants in both groups (control and intervention) showed significant reductions in BMI -z-score and energy intake, as well as increased hours of moderate and vigorous physical activity at 3 months of intervention (p<0.05). At 6 months, these improvements were sustained.
Football Fans in Training Program (FFIT).[21]	Weight loss sustained over the long term, as well as self-reported physical activity, intake of fatty and/or sugary food, fruit, vegetables and alcohol, BMI, waist circumference (WC), physical and mental quality, self-esteem.
Social media-based intervention.[22]	Participants found the social media support enjoyable, helpful in reinforcing goals for weight management, a source of motivation. However, they reported the need to implement a face-to-face weight management program along with the social media support group (92%; [12/13]).
Online commercial program: Weight Watchers Online.[23]	Both groups achieved statistically significant weight loss (p < 0.001), but the ± standard error of weight mean did not differ between the groups at 3 or 6 months. However, the intervention group achieved a clinically significant weight loss of ≥5% of initial body weight at 3 months, though this effect did not persist at 6 months.
Computerized programs: WebMOVE and MOVE SMI.[24]	The WebMOVE intervention was effective in weight loss compared to the other intervention groups, as the WebMOVE model estimated a mean change in BMI from baseline to six months from 34.9 ± 0.43 to 34.1 ± 0.43. This corresponded to a weight loss of 2.8 kg in the WebMOVE group, while there was no substantial change in the SMI MOVE group.
Health promotion school program.[25]	After the 12-week intervention, there was a significant reduction in the individuals' fat mass; however, there were no significant changes in the BMI level.
Dietary intervention.[26]	After the 8-week intervention, analysis in the WSP-MR group (intervention group) revealed a significant 5% reduction in weight loss, body fat, and BMI. The results indicated that the strategies of this weight loss intervention were effective in treating overweight workers.
Wearable Technology.[27]	There was weight loss in all treatment conditions, as well as an increase in energy expenditure in physical activity throughout the 6-month intervention (p< 0.0001). Regarding food intake, there was a reduction in total energy intake and percentage of fat in the diet (p< 0,001).
Dietary intervention.[28]	The average rate of weight loss decreased in both intervention groups, with a faster rate of weight loss in the ISO group compared to the SUC group. The results showed that the ISO-based diet, compared to that of SUC, was more effective in promoting weight loss, once there were also significant changes in fat mass reduction in the ISO group.
Lifestyle program: *Individual Health Management* (IHM).[29]	Both groups had statistically significant weight reduction between months 0 and 12 (P< 0, 001). Thus, in the intervention group (HCI) a mean decrease of 8.7 kg was observed at month 12 compared to the control group, where the mean weight was 4.2 kg. In the HCI group, all anthropometric parameters improved significantly, except for total cholesterol.
Social network online intervention.[30]	The study indicated that weight loss of an intervention delivered through an Online Social Networking system (OSR) was not significantly different compared to a group teleconference system.
Mobile technology-based intervention.[31]	The women who received push notifications lost more weight, more total body fat, and had better muscle mass results in contrast to those who did not receive such notifications.

Figure 3. Overview of health technologies and main results. Picos (PI), Brazil, 2020.

Figure 3 shows the diversity of health technologies developed for obesity management. Most of the studies analyzed used interventions for the control of obesity or overweight with the aid of mobile technology at some point, either through counseling via text messages, phone calls, or mobile applications. In addition, the results of these studies showed significant weight loss, as well as improvements in BMI, physical activity, diet, WC, lean body mass, fat percentage, besides a reduction in blood pressure.[16-8, 23, 27, 29, 31]

DISCUSSION

It is known that, currently, the prevalence of NCDs has become a concern of public health services, being associated mainly with cardiovascular and metabolic diseases, among which obesity.[32] This review included data on studies that used some type of health technology, obtaining positive results in weight management, BMI, WC, fat mass levels, eating patterns, and physical activity practice in overweight or obese patients. It is noteworthy that such changes, when not balanced, represent an important risk factor for the development and aggravation of chronic diseases.[33]

The prevalence of obesity among the studies is reported to have been higher among females, with the average age being between 13 and 55 years old,[14-5,17,19-20,22-3,27,31] since the investigations were carried out in distinct communities, with cultural and specific socioeconomic factors to each locality, which in most cases interfere with the predominant population of a study.

It was evidenced in a survey, after analyzing the characterization of the population with obesity, that the prevalence of both overweight and obesity was higher in females, also showing that both became more prevalent as the age range of both sexes increased, tending to decrease after 60 years of age.[34] Another study identified that the different metabolic effects that obesity is associated with, such as excessive accumulation of body fat in the form of adipose tissue, are aggravated with advancing age, when fat is easily acquired, but difficult to eliminate.[35]

The use of different definitions and methods for measuring obesity by the authors of the publications is also pointed out to have contributed greatly to the positive results in weight management among the participants in the studies. Several indicators of obesity are currently available, including BMI, considered the gold standard by the WHO, and the Conicity Index (CI), both used to identify patients at cardiovascular risk and with factors associated with medical complications and mortality rate.[35]

After the intervention based on the use of diets with white sweet potato substitutes, and the ISO, with emphasis on energy reduction and healthy eating habits, satisfactory results in weight loss and BMI were observed, as well as a reduction in energy intake and body fat.[26,28] It was also identified, in a study aimed at satiating hunger in obese people by replacing carbohydrates with fat

and fiber from avocados without increasing the energy or energy density, that such use was highly acceptable and useful in weight management.[36]

Another approach to health interventions is included, such as the applicability of Information and Communication Technologies (ICTs) that have been growing as one of the main proposals for treatment of obese people, being closely connected to three factors: increase in chronic diseases; reduction in access to clinical care; and innovations in the use of mobile technologies. Through new approaches to technology, the patient's self-learning and the enhancement of personal relationships among groups with the same disease or even among professionals are assisted, giving the client the opportunity to be an active agent, responsible for his treatment and for the care related to his health.[37]

Therefore, among the elements of the new approaches to technology is the use of counseling by health professionals that is now done by telephone, text messages, and educational materials available on websites. Two studies in the United States have evaluated the effects of counseling on physical activity and diet by using telephone and web-based devices, with both studies showing no significant differences in physical activity and dietary intake between the groups.[13,15]

The use of social media to increase physical activity and reduce calorie intake for weight management purposes among overweight and obese individuals has also been found to be quite enjoyable, with 100% of the participants in a study conducted in the United States stating that social media support is useful for reinforcing weight management goals, as well as being a source of motivation.[22] However, it should be noted that another study, which sought to evaluate weight management through an online social networking system compared to a teleconferencing system, showed that weight loss was not significant and the participants did not feel comfortable sharing their goals among the social networking group.[30]

It can be observed that the non-effectiveness of some technologies in weight management may be associated with the implementation of their methods toward health, especially when the interventions occur in the school environment and with adolescent or high poverty population.[38]

It was also shown in a study conducted in the United States that the use of ICTs for the prevention or management of obesity, despite not having impacted body weight, proved to be an approach with good acceptability, representing a feasible possibility for the contact between professionals and the target audience.[39]

It is noteworthy that although most of the reviewed studies have evidenced the use of mobile technologies as a satisfactory alternative for obesity management, some barriers are pointed out as implications in the process of adherence to these technologies, such as the economic status of the

population, age, education level, rural and/or high poverty region, which restrict access to the internet and to transportation to go to treatment centers, as well as the management of sophisticated applications, thus limiting the applicability of the use of weight management interventions based on mobile devices.[40]

In view of the presented studies, it can be noticed that the use of various forms of technologies, especially the information and communication ones found in most of the surveys, have proven to be effective in controlling and promoting the health of obese or overweight patients.

It can be stated that the findings gathered in this review can contribute to the enhancement of knowledge in the health area about the various technologies implemented for the management, prevention, and health promotion of patients with overweight and/or obesity, in addition to enabling health professionals to reflect on the relevance of carrying out interventions aimed at this public in order to minimize health problems.

CONCLUSION

Several forms of health technologies used in the management of obesity were identified in this review, including food technologies, medication technology, use of text messages, phone calls, and mobile applications. The use of these technologies was presented as a major effect of adherence to physical activity, of replacing caloric diets, of controlling the various anthropometric indices, thus contributing to the weight management of overweight and obese patients.

Hence, based on the analyzed studies, it was noticed that the use of technologies in the management of obesity can improve the social relationship among patients, disseminating knowledge and information not yet understandable to some, as well as favoring the motivation during treatment, since the use of health technologies proved to be satisfactory to most of the beneficiary population.

It is noteworthy that although the use of these technologies assists, in a complementary way, patients outside the clinical context, there is the need for a face-to-face follow-up monitoring between professionals and patients, since many of the technologies, such as mobile technologies, are not yet accessible to the entire population, considering the lack of adherence to cell phones in communities with high poverty rates or by people with chronic diseases, including obesity.

Therefore, there is a need for more studies that seek innovative and effective solutions for this public, focused on strategies that involve weight management outside the clinical environment in a sustainable and economical way.

CONTRIBUTIONS

All authors contributed equally to the study design, data collection, analysis and discussion, as well as in the writing and critical review of the content with intellectual contribution and approval of the final version of the study.

CONFLICT OF INTEREST

Nothing to declare.

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