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Research Article

Mobile Applications To Promote Healthy Lifestyles: A Systematic Review Use Of Mobile Applications To Promote Healthy Lifestyles: A Systematic Review

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ABSTRACT

Mobile applications are very popular, mainly among adolescents and young people. There are applications in different areas of man's life, however, we will only address those that promote healthy lifestyles; with the aim of analyzing its existence and use in children, adolescents, young people and adults. The PRISMA methodology was used and a search for scientific articles published in the last five years was used in four highly prestigious databases: Scopus, Web of science, Scielo and Google academic. The search identified 89 articles, 9 were selected for the systematic review. The results are presented in tables, considering three dimensions of apps: physical activity, healthy eating and health. It is concluded that there is a range of applications that promote healthy lifestyles and their use is increasingly required, therefore, it is necessary to continue delving into the topic.

Keywords: Mobile applications; healthy lifestyles

INTRODUCTION

In Peru, the Supervisory Body for Private Investment in Telecommunications (OSIPTEL, 2022) reveals that 88.4% of households own a smart cell phone, making it a priority asset. In addition, it reports that the fastest growing telecommunications service in Peru is the Internet, 87.7% of Peruvian homes have access to the Internet. For their part, Mera et al. (2019), mentions that the growth of ICT and the massive use of the Internet go beyond communicative purposes and leisure, or is only exclusive to some professional fields such as engineering or technology, but also various work areas including health, education. , sport, physical activity on a global scale have begun to use these tools to carry out their professional work

Regarding the use of mobile applications that promote healthy lifestyles, Aznar et al. (2019), in Spain carried out a meta-analysis study, with the objective of examining the effect of the use of mobile applications on physical activity, the study focused on the review of scientific articles published in highly credible indexed journals. The systemic review method with meta-analysis was used, the results show that there is a diversity of apps used in physical activity. Finally, it concludes that mobile applications are high-impact tools to increase physical activity levels and are a motivational reference for developing Physical Education sessions.
The study designed in Peru to monitor physical activity levels in adolescents aged 12 to 17 years from the coast, mountains and jungle, carried out by Mamani et al. (2023), applied the Questionnaire on physical activity for schoolchildren (CAFE) following the WHO guidelines, with the purpose of determining its reliability and validity. After its application, the findings confirmed that the reliability of the test is adequate and its validity optimal.

On the market, there are many applications designed for health care (practice of a healthy lifestyle, monitoring of physical exercise, eating habits, exercise routines, monitoring of vital signs, personal trainers, etc.) and their proliferation has grown exponentially (Yot-Domínguez et al., 2020). However, its knowledge and proper use, specifically by children and adolescents, is minimal. Likewise, it has been identified that there are systemic review studies that analyze the existence of apps in the field of medicine, education, including in the area of mental health (RodríguezRiesco & Senín-Calderón, 2021). But there are no specific systemic works that focus on examining the use of applications that promote healthy lifestyles.

Given the aforementioned, the following research questions were posed:
To what extent does identifying scientific articles on the use of mobile applications and healthy lifestyles expand general knowledge about this area?

To what extent does examining the use of apps and healthy lifestyles deepen specific knowledge about physical activity, nutrition, and health?

The study is justified because it will allow us to have a general and specific look at the use of applications and their influence on the creation of healthy lifestyles (physical activity, nutrition and health). Likewise, it will allow people to manage updated and specific information in the field of health; helping them improve their quality of life based on scientific knowledge.
Therefore, the objective of this systematic review was to identify and examine the availability and use of applications that promote healthy lifestyles, selecting those that demonstrate effectiveness and feasibility in their use.

METHODOLOGY

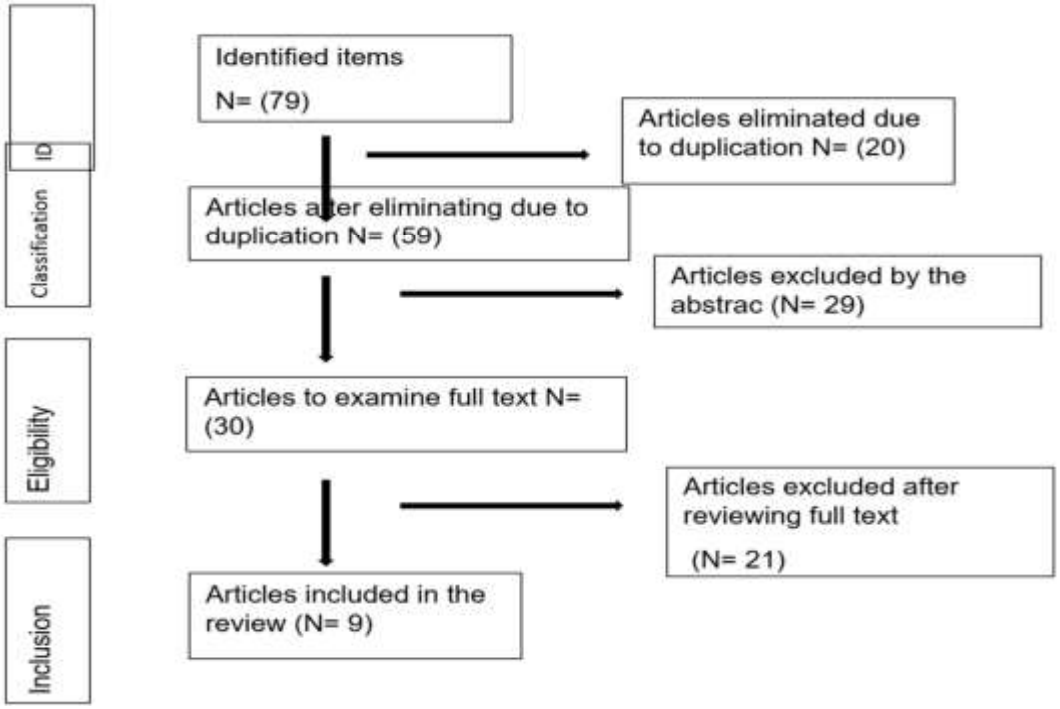
To prepare our systematic review, the PRISMA methodology was used. Regarding the search and bibliographic review related to the use of mobile applications and healthy lifestyles; It was carried out in five databases: Scopus, Web of science, Scielo, Google academic; scientific studies published in the last five years (2017 – 2023). Advanced search strategies were used; Boolean operators AND, OR, NOT.

The following inclusion parameters were considered: articles published in Spanish or English that are focused on the use of applications and healthy lifestyles, must have been published in Scopus, Web of science, Scielo, Google academic, publication date in the last five years. Exclusion parameters were studies published in journals other than those mentioned, scientific literature that is not related to the topic of study, studies older than five years and articles that do not provide scientific evidence.

The study population consisted of 79 scientific articles identified in scientific journals selected for the systematic review. The sample was 9 articles selected according to inclusion and exclusion parameters.
To ensure the scientific accuracy of this review, we took into account the PRISMA 2020 communication guidelines: Updated Guidelines for the Publication of Systematic Reviews (Page et al., 2021).

The following steps were carried out for the identification and filtering of documents. Firstly, according to the selected database, the title of all publications related to the topic was read and the most relevant were selected. Secondly, the abstract was examined, collecting studies that met the inclusion parameters. Finally, full texts were reviewed to identify articles for inclusion in the systematic review. The whole process is shown in Figure 1.

Figure 1 PRISMA flowchart.



RESULTS

After the identification and selection process, 9 scientific articles were included as the final sample for this systemic review. The selected literature is organized in three dimensions, each dimension is presented in a structured table as follows: Author and year, title, objectives, type of study, sample, results and conclusion.
Table 1, physical activity dimension and mobile applications, three research studies were selected and examined with the use of mobile applications and their impact on the practice of physical activity.
Table 2, healthy eating and mobile applications dimension, three scientific articles that link the use of mobile applications and their influence on healthy eating were selected and examined.
- Table 3, health dimension and mobile applications, three systematic reviews that address the issue of use of mobile applications and their effect on the person's general health were selected and examined.

Table 1 Studies related to physical activity and use of mobile applications

Author(year)	Qualification	Aim	Type o study	Sample (N)	Results	Conclusion
	Impact of a plan	Determine th	eExperimental	eStudents	Regard to th	The
(Caves et al., 2023)	of physica activity doing use of a mobile app in composition bodily of students	effects of a program of physical activity (AF) fundamentally in the use of		university students, 10 men and lev en women.	e improvement in the composition bodily wa he index of mass body mass (BMI and fat mass (p <	interventions of AF that they use sApplications mobiles lead to a elderly consumption of

	university student during the pandemic COVID-19.	san app mobile in relationstothe hip composition bodily of students university students in the pandemic du e to coronavirus.			0.05, was small. No howe ver, regard to the consumption energetic was elderly that the energy intake after of the study (p < 0.01), that before (p. < 0.05).	energy. No however, the variations in the composition Bodily are minors. For the so much, addition to supplementation with ing long-term nutritional term, HE recommends design interventions of AF throu gh Applications mobiles.

(Ángel Durán-Vinegar et al., 2021)	The TIC as a tool of motivation for promote the practice ofphysical activity in teenagers: one systematic review	The main objective of this study was to perform a systematic review of studies evaluating the effectiveness of motivation and use of ICT for improve the practices of physical activity in adolescents.	Systematic review PRISMA Methodology	N = 243 articles	The results provide scientific evidence that justifies the use appropriate ICT motivate and positively influence in the practice of physical activity. However, if gives a use inadequate of technological tools is the main cause of sedentary lifestyle, physical inactivity and habits bihealthy in the population.	Technological tools have proven to be the most diasuitable for increasing motivation and physical activity. In addition,some studies found that the use of They increase their physical condition. The technology can help the teachers to promote practice of activitiesphysical outside the formal scope of the school, increasing the autonomy of the students.
(Diaz et al., 2019)	Effects of mobile applications about the physical activity a meta-analysis	The purpose was to examine the effects of the Applications mobile phones on physical activity from the identification of studies published in indexed magazines.	Systematic review Meta analysis	The sample is made up by empirical studies with two groups, experiment and control group (n = 18).	He study confirmed the diversity of apps employed for the physical activity highlighting a significant statistical impact in favor of the experimental group.	The mobile devices They are powerful tools for improve and increase sports practice, the create new elementsmotivational in physical education.

Note. The sources of information are Scopus, Web of science, Scielo and Google Scholar.

Interpretation Table 1, regarding the dimension use of applications that promote physical activity, the study by Cuevas et al. (2023) determined that with interventions on physical activity where mobile applications are used, people find better results in terms of greater calorie consumption and lower body composition. For their part, Duran et al. (2021) demonstrated that when ICT is used appropriately, motivation to practice physical activity significantly increases, but when technological tools are used inappropriately, they are the main cause of sedentary behavior, physical inactivity, and a decrease in healthy habits. Finally, Diaz et al. (2019) analyzed the effect of mobile applications on physical activity, concluding based on their findings that the use of apps is a powerful resource to increase sports practice and physical activity, and they also play a motivational role in Physical Education classes.

Table 2 Studies related to healthy eating and use of mobile applications

Author (year)	Qualification	Aim	Kind of study	Sample (N)	Results	Conclusion
(Muñoz and Abdón, 2023)	Analyze th influence o social network and mobil applications o healthy eating: systematic review	eUnderstand the curre n state o eresearch o nhealthy aeating published o social networks an mobile applications.	A systemati review n n d	cN = 122 articles	The positiv effect o social networks an mobile applications was determined, mainly i young adul users betwee 18 and 3 years old influencing their health eating.	eA large number o young people aware that dinformation published on social network influences their health decisions. It also found that early ⁿinternet use and a higher level of digita ⁿliteracy positively ⁵impacts your dietary decisions. y
	satisfaction wit educational interventions tha include the use o an app i overweight o obese people.	hmodificati ons an personal satisfactio nn in th context o an educationa l interventio n for obes patients that involves the use of one	d e e		lost aaverage of 2. ± 2.6 kg, while th group c ntrol lost aaverage of 0. ± 1.6 kg (p 0.08).	eating has proven to be an effective too 1in people who are overweight or obesity. o 7 =

(Luz et al 2022)	Healthy lifestyl habits i university professors an students	The purpose was t understan the lif habits o students and teachers a a university in Mexico	Descriptive correlationale xecuted unde a non experimental design.	Made up o 524 participants,3 2 students and 18 teachers.	The mos relevant findings highlight tha 74.2% of th study population have acceptable lifestyles. However, nutrition an physical activity stan out as the mos inadequate habits i university students.	We conclude tha there is a need t improve the lifestyl habits of teacher and student especially throug programs tha promote physica activity but als provide nutritio and healt education.
(Aguilar Garcíaet al., 2019)	Changesanthrop metric measurements and persona	To evaluate anthropon etric	Experimental	experimental group,n=26, control, n=26	He luster experimental	The use of th NutriMetas application as a toc to promote health
		mobile app (NutriMetas)				

Note. The sources of information are Scopus, Web of science, Scielo and Google Scholar.
Interpretation Table 2, studies on healthy eating and mobile applications, Muñoz and Abdon (2023), in their systematic review on the effect of social networks and mobile applications on healthy nutrition, maintain that a high percentage of Thursdays (18 to 35 years old) They recognize that information published on social networks has an influence on their decisions about their nutritional habits and that digital literacy at an early age positively impacts dietary decision making. Luz et al. (2022), sought to understand the life habits of university students and professors, the most relevant finding was poor nutrition and lack of physical activity and personal habits as inadequate. Therefore, in this technological era there is an urgent need to promote healthy lifestyles such as healthy eating and physical activity. Aguilar et al. (2019), made use of a mobile application to evaluate anthropometric changes in overweight and obese people, the result showed that the experimental group showed an average weight loss of 2.1 ± 2.6 kg compared to 0.7 ± 1.6 kg in the control group. Therefore, they demonstrated that the use of the NutriMetas application is an effective tool for this type of patients.

Table 3 Studies related to health and use of mobile applications

Author (year)	Qualification	Aim	Kind of study	Sample (N)	Results	Conclusion
(Rodriguez and Senín, 2021)	Applications mobiles in	Know her utility of	Revision	N = 193	They wer identified 193 articl e and	eThe use of applications in

	Spanish for evaluate and intervene in health mental: a revision systematic	applications in Spanish for evaluation and intervention in mental health in populations clinics and no clinics.	systematic	articles	were selected 11 for study. The findings are show of according to the type by population attended clinic and no clinical, according to the symptom that are treated.	Spanish for mental health is limited, but results promising suggest the Need to do more investigations in this area for improve quality and effectiveness of the attention of the mental health.
(Alos Puig-Ribera, 2021)	Use of Applications mobiles and wearables (mHealth) for transform the lifestyle in	Review, describe and discuss in general use of technology mobile for modify the	Revision narrative Method SANRA	Not precise		mHealth has the potential of address many of the challenges that face the PAs in the environment of medical attention
	Primary care clinical practice: narrative review	sedentary lifestyles and physical inactivity, replacing them with non-sedentary behaviors and increased physical activity.				current. These devices can be important tools for modifying lifestyles. For example, it seems effective against lack of exercise and sedentary lifestyle. It also helps patients take more active control of their health and promotes self determination. However, there is resistance to the implementation of mHealth programs by experts due to doubts about their quality and effectiveness.

(Tatiana VelandiaBrnal et al 2021)	Applicationsmobile phones ihealth, qualitative systematic review	Identify applicationsemerging ihealth ananalyze thresults otheir usedesign anevaluation.	Qualitative systematic review	Databases (= 55) Googleacadmic (n = 83	46.7% chealth appwere createfor patientand 27.7% fohealth workers. Thmost commouses armonitoring and treatmerof diseases	Mobile applications aressential toolto promothealth, wellbeing anreduce inequalities. However, advances ivalidation ancertification
					(23.8%), diagnosis (15.3%); adherence ttreatment (10.7%) and attention cthe health (10.7%).	processes arneeded tensure reliabland safbenefits fousers.

Note. The sources of information are Scopus, Web of science, Scielo and Google Scholar.

Interpretation Table 3, the health aspect was considered, Rodríguez and Senín (2021) did a systematic review regarding the use of mobile applications to evaluate the mental health of clinical and non-clinical patients, they identified 193 articles, of which they selected 11 To analyze them, they concluded that the use of mobile applications in mental health is unlimited, and that there is a need to continue expanding studies to improve effectiveness in this area. For their part, Alós and Puig (2021), carried out a narrative review on mhealth and its influence on lifestyle changes, indicating that the use of wearables and applications (mhealth) are very effective for primary medical care; They are important tools and devices to promote a healthy diet and encourage physical activity. Velandía et al. (2021), conducted a systemic review to learn about mobile applications on health that exist and analyze their use, design and evaluation, they found that 46.7% of applications were created for patients and 27.7% for use by health workers, generally used for diagnosis, monitoring, treatment and follow-up of patients. Highlighting that mobile applications are essential for health, however, progress is needed in their validation and certification to guarantee their benefits.

DISCUSSION

Currently the use of smart mobile devices, social networks and the use of applications are protagonists, they have become the main resource for communication and dissemination of information, generating great influence on human beings. However, as indicated in their study by Cuevas et al. (2023), if ICT is used inappropriately, it can be the main cause of sedentary lifestyle and physical inactivity; however, if its use is appropriate, it is a great source of motivation and promoter of healthy lifestyles. The literature reviewed on physical activity and the use of apps indicates that their use has grown greatly and their use is decisive in motivating and promoting the practice of physical activity. Therefore, it is a priority to teach future generations to make good use of the full range of technology available.

Regarding the use of applications and their influence on healthy eating, the studies examined in this review categorically affirm that applications and social networks influence people's nutritional decisions, especially young people, (Muñoz and Abdon, 2023). Considering these effective tools to improve the nutritional aspect of human beings, it is important to disseminate and use them at all ages: children, adolescents, young people and adults.

The use of applications in health, there is also a wide variety of applications in this area, highlighting the study by Alós and Puig (2021), they carried out a narrative review on mhealth and its influence on lifestyle changes, highlighting the universe Of applications, 46.7 of apps are for use by patients and 27.7 for use by healthcare personnel. Also in the reviewed studies it is mentioned that its validity and certification need to be improved to guarantee the effectiveness of its use: to diagnose, treat, follow-up and monitor patients.

The strength of the study lies in focusing on updated studies on the use of applications in the field of physical activity, healthy eating and health. Always aiming to create an improved quality of life for people.

The main limitation is that there is still a small number of studies aimed at the use of apps and their influence on the creation of healthy lifestyles. I consider that it is a field of study in growing development and that the near future will have a lot of research in this area.

CONCLUSION

The purpose of the scope of the systematic review was to identify and examine the use of mobile applications that promote healthy habits in children, adolescents, young people and adults, it is concluded:

- It was identified with scientific evidence that there is a wide variety of apps aimed atthe promotion of healthy lifestyles (practice of physical activity and healthy eating) and that technological advancement has grown and has a great boom in today's society, social networks and use of applications, if inappropriate use occurs, can contribute to a sedentary lifestyle and physical inactivity, but if used rationally and appropriately, it produces an engine that drives healthy lifestyles; in addition, literacy should be taught about it from an early age.
- It was examined that the use of ICT increases and serves as motivation for the practice ofphysical activity. It influences the nutritional decisions of human beings, in this sense the applications that promote healthy eating must be disseminated and available to all ages: children, adolescents, young people and adults. There are applications in a variety of areas, in the health field they are used in primary care to diagnose, prevent, treat and monitor patients. Therefore, apps should be for prevention and promoting healthy lifestyles.

CONFLICT OF INTERESTS

I declare that there is no conflict of interest in the publication of this scientific article.

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