THE USE OF THE WHATSAPP MOBILE APPLICATION IN HEALTH: INTEGRATIVE REVIEW

O USO DO APLICATIVO MÓVEL WHATSAPP NA SAÚDE: REVISÃO INTEGRATIVA

EL USO DE LA APLICACIÓN MÓVIL WHATSAPP EN SALUD: REVISIÓN INTEGRATIVA

🔴 Jéssica Caroline dos Santos[1]
🔴 Laura Barbosa Nunes[1]
🔴 Ilka Afonso Reis[2]
🔴 Heloisa de Carvalho Torres[1]

[1]Universidade Federal de Minas Gerais - UFMG, Escola de Enfermagem. Belo Horizonte, MG - Brazil.
[2]UFMG, Departamento de Estatística. Belo Horizonte, MG - Brazil.

Corresponding Author: Jéssica Caroline Santos
E-mail: jessica-caroline31@hotmail.com

Authors' Contribution:
Conceptualization: Jéssica C. Santos; Heloisa C. Torres; Data Collection: Jéssica C. Santos; Investigation: Jéssica C. Santos, Laura B. Nunes, Ilka A. Reis, Heloisa C. Torres; Methodology: Jéssica C. Santos, Laura B. Nunes, Ilka A. Reis, Heloisa C. Torres; Project Management: Jéssica C. Santos; Statistical Analysis: Jéssica C. Santos, Laura B. Nunes, Ilka A. Reis; Supervision: Jéssica C. Santos; Ilka A. Reis, Heloisa C. Torres; Visualization: Jéssica C. Santos, Ilka A. Reis, Heloisa C. Torres; Writing – Original Draft Preparation: Jéssica C. Santos; Writing – Review and Editing: Jéssica C. Santos, Laura B. Nunes, Ilka A. Reis, Heloisa C. Torres.

ABSTRACT

Objective: to identify the current state of the art and research trends that use the mobile WhatsApp application in the healthcare. Method: integrative literature review in the databases PubMed, CINAHL, SCOPUS and LILACS, from 2009 to 2019. Results: sample composed of 24 studies grouped into three analysis categories: use of WhatsApp by healthcare professionals/students as a communication, teaching and learning tool (n=5); use of WhatsApp by the professional in the health service (n=13); and use of WhatsApp for health education/information exchange between professional and patient (n=6). Conclusion: scientific evidence shows that the use of WhatsApp favors the existing communication between professionals in a healthcare service and even between professionals, healthcare students and patients.
Keywords: Telemedicine; Information Technology; Public Health; Communications Media; Health Education.

RESUMO

Objetivo: identificar o estado atual da arte e as tendências de pesquisas que utilizam o aplicativo móvel WhatsApp na área da saúde. Método: revisão integrativa da literatura nas bases de dados PubMed, CINAHL, SCOPUS e LILACS, no período de 2009 a 2019. Resultados: amostra composta de 24 estudos agrupados em três categorias de análise: uso do WhatsApp por profissionais/estudantes da área da saúde como ferramenta de comunicação, ensino e aprendizagem (n=5); uso do WhatsApp pelo profissional no serviço de saúde (n=13); e uso do WhatsApp para educação em saúde/ troca de informação entre profissional e paciente (n=6). Conclusão: evidências científicas mostram que o uso do WhatsApp favorece a comunicação existente entre os profissionais em um serviço de saúde e até mesmo entre profissionais, estudantes da área da saúde e pacientes.
Palavras-chave: Temedicina; Tecnologia da Informação; Saúde Pública; Meios de Comunicação; Educação em Saúde.

RESUMEN

Objetivo: identificar el estado actual del arte y las tendencias de investigación que utilizan la aplicación móvil WhatsApp en la atención médica. Método: revisión integrativa de la literatura en las bases de datos PubMed, CINAHL, SCOPUS y LILACS, en el período de 2009 a 2019. Resultados: muestra compuesta por 24 estudios agrupados en tres categorías de análisis: uso do WhatsApp por profesionales/estudiantes de salud como herramienta de comunicación, enseñanza y aprendizaje (n=5); uso de WhatsApp por parte del profesional del servicio de salud (n=13); y uso de WhatsApp para educación en salud/intercambio de información entre profesional y paciente (n=6). Conclusión: la evidencia científica muestra que el uso de WhatsApp favorece la comunicación existente entre los profesionales de un servicio de salud e incluso entre profesionales, estudiantes de salud y pacientes.
Palabras clave: Telemedicina; Tecnología de la Información; Salud Pública; Medios de Comunicación; Educación en Salud.

INTRODUCTION

Information and communication technologies (ICT) consist of the use of any form of information transmission and correspond to all technologies that interfere and mediate communication processes, whether by computers, smartphones, and software, and have the internet as their main instrument.[1] Among ICTs, a technology that spread quickly was smartphones and their applications (APP). These represent an important part of modern life and allow us to communicate with people from different places through calls, e-mails, text messages and social networks.[2,3]

One of these APPs is WhatsApp Messenger, a tool that provides the exchange of instant messages, photos, videos, and voice calls, available for the Android, iOS, and Windows operating systems (WHATSAPP INC.). The application has become attractive to the public, since, after its installation, its use is free, depending on an internet connection.[2] In the world, the estimated number of WhatsApp users is around 1 billion people. In Brazil, the application has already reached the mark of 120 million users (WHATSAPP INC.).

Given the popularity of this application, it is not surprising that it is being used increasingly in the healthcare, with applications for professional support, health education and patient care.[3,5] Furthermore, international studies have revealed that the use this tool can favor the provision of healthcare to patients in remote regions, especially those related to medical specialties, improving the accessibility, quality and efficiency of the care provided.[6,7]

However, due to the contemporary nature of this resource and considering that the national literature on this topic is incipient and not very comprehensive, the question is: how is the WhatsApp Messenger application being used in healthcare? In this sense, the objective was to identify the current state of the art and the research trends that use the WhatsApp mobile application in healthcare.

METHOD

It is an integrative literature review, a method that is constituted by allowing the synthesis of the knowledge of a given subject and allows indicating gaps that need to be filled. For the preparation of the study, the following methodological steps were adopted: definition of the clinical problem, hypothesis or research question; criteria search and determination process; categorization

and extraction of information; evaluation of studies; interpretation of results; and presentation of the knowledge synthesis review.[8,9]

The guiding question is: "how is the WhatsApp Messenger application being used in healthcare?" Four organizational stages were established for the integrative review process. These steps are detailed below.

Step 1, data collection, took place in January 2020, and the following electronic databases were used in the selection of articles: National Library of Medicine National Institutes of Health (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), SCOPUS and Latin American and Caribbean Literature in Health Sciences (LILACS), the latter being indexed on the Virtual Health Library (VHL) portal. Still in this step, the search terms for bibliographic processing were selected in the Health Science Descriptors (DeCS/ Bireme) and in the MeSH Database and the Boolean operators OR and AND were applied. Thus, the combination of descriptors used in LILACS was presented as follows: "("Mobile Applications"OR"Mobile Applications"OR"Aplicaciones Móviles") AND ("WhatsApp"OR"WhatsApp")" and for the other databases of data, PubMed, CINAHL and SCOPUS the following combination of terms was used: "("Mobile Applications") AND ("WhatsApp"OR"WhatsApp")".

For step 2, a thorough analysis of the texts was carried out in order to verify the adequacy to the established inclusion criteria, which were: to be available in Portuguese, English and Spanish; be related to the health area; understand the search time established from 2009 to 2019, since when WhatsApp is in effect. In addition, aiming at the scope of this study, review articles, editorials, comments, books, abstracts, and reply letters were discarded. Those in duplicates were considered only once.

In turn, in step 3, a second analysis was carried out, with the full reading of the articles found. Through the complete reading of the studies, articles that were not related to the theme and that addressed other mobile applications were observed, these were excluded. It is noteworthy that the selection and exclusion of articles complied the following sequence of databases: LILACS, PUBMED, SCOPUS and CINAHL. Subsequently, in the fourth and last step, a critical analysis of the selected articles was carried out. In order to facilitate the management of the articles, all the manuscripts were placed in a folder in the Mendeley file manager software. In addition, the selected articles that made up the integrative review had their data recorded in a spreadsheet, as recommended by the literature.[8]

In addition, a reverse search was carried out in order to capture the largest number of manuscripts. It is worth mentioning that the steps of database research, selection, analysis of studies and data collection were conducted independently by two researchers, in order to ensure the accuracy during the selection of articles. For that, a classification of the studies was done with yes or no according to the pertinence to the objective of the integrative review. Subsequently, the Kappa test was used, a simple agreement analysis, which is based on the number of agreeable responses, that is, the number of cases whose result of the selection of articles is the same among the researchers. When there was no agreement between the selection items, a consensus was reached between the reviewers and a new evaluation by a third researcher.

For the categorization of the evidence level of the articles, the Nursing classification was used, which advocates a certain hierarchy depending on the research design adopted for the development of the study. This categorization is arranged in seven levels, being level 1 (strongest) the evidence from systematic review or meta-analysis of randomized clinical trials; level 2, evidence derived from well-designed randomized clinical trials; level 3, evidence obtained from well-designed clinical trials, without randomization; level 4, evidence from well-designed cohort and case-control studies; level 5, evidence from systematic review of descriptive and qualitative studies; level 6, evidence derived from a single descriptive or qualitative study; and level 7 (weakest), evidence from expert opinion. The definition of the type of article was maintained according to the authors of the research included in the sample.[10]

As for the critical analysis, a summary table was prepared with the synthesis of the selected articles, containing the description of the following items: name of the article, reference, year of publication, journal, country, language, type of population (health professional, student and/or patient and/or family), descriptors used, objective, level of evidence, type of study, methodological and sample details, WhatsApp use strategy, results, and recommendations/conclusions. For the interpretation of results and presentation of the review, it was agreed to discuss the findings from the converging themes found in the articles.

The content extracted from the articles that comprised the sample was part of the results and discussion of this study. It is noteworthy that the ethical principles were preserved, respecting copyright, by citing the authors.

RESULTS

The search in the databases detected a total of 173 studies that addressed the theme of applications, which were analyzed according to the methodological steps. Of these, 91 were selected for full reading, so that the sample in this review was composed of 24 studies, the degree of agreement between the reviewers was established by the Kappa test and the index reached was 0.86%, which indicates excellent agreement between the researchers. The flowchart with the stages of the study inclusion process is shown in Figure 1.

Of the selected articles, publications were contacted in the years 2015 to 2019, and in 2018 there were no publications and 2019 was the year with the largest number of them (38%). Regarding the language, 96% of the articles were published in the English language, 4% in the Spanish language and, although there are articles of Brazilian origin, none were published in the Portuguese language. The publications are of national origin (8%) and international (92%), with Turkey being the country with the largest number of publications (23%).

Analyzing the type of study in terms of characteristics, 60% had a quantitative methodological approach, 32% used a qualitative methodological approach and 8%, mixed methods. The level of evidence of 79% of the articles that comprise the sample of this integrative review was classified as weak - grade six -, with the exception of those with clinical trials, with studies A7 and A10 being classified with level of evidence 3 and A15, A16 and A21 with level 2 (Figure 2).

It was found through this integrative review that WhatsApp was used in healthcare by the following audience: 11.5% of healthcare students, 54% of doctors, 11.5% of dentists and oral health assistants, 7.6% of a multidisciplinary team and 27% of patients and their families. Some articles had a mixed target audience, sometimes made up of different professionals, sometimes made up of professionals and patients and/or family members.

Figure 2 summarizes the articles of the integrative review according to reference, year of publication, database, country of origin, target audience, type of study and level of evidence.

The analysis of the studies that comprised the review sample made it possible to identify a diverse variety of participants, ranging from undergraduate students and healthcare professionals to family members and patients with the most diverse needs and/or treatment, which are presented in three categories of analysis: a) use of WhatsApp by healthcare professionals/students
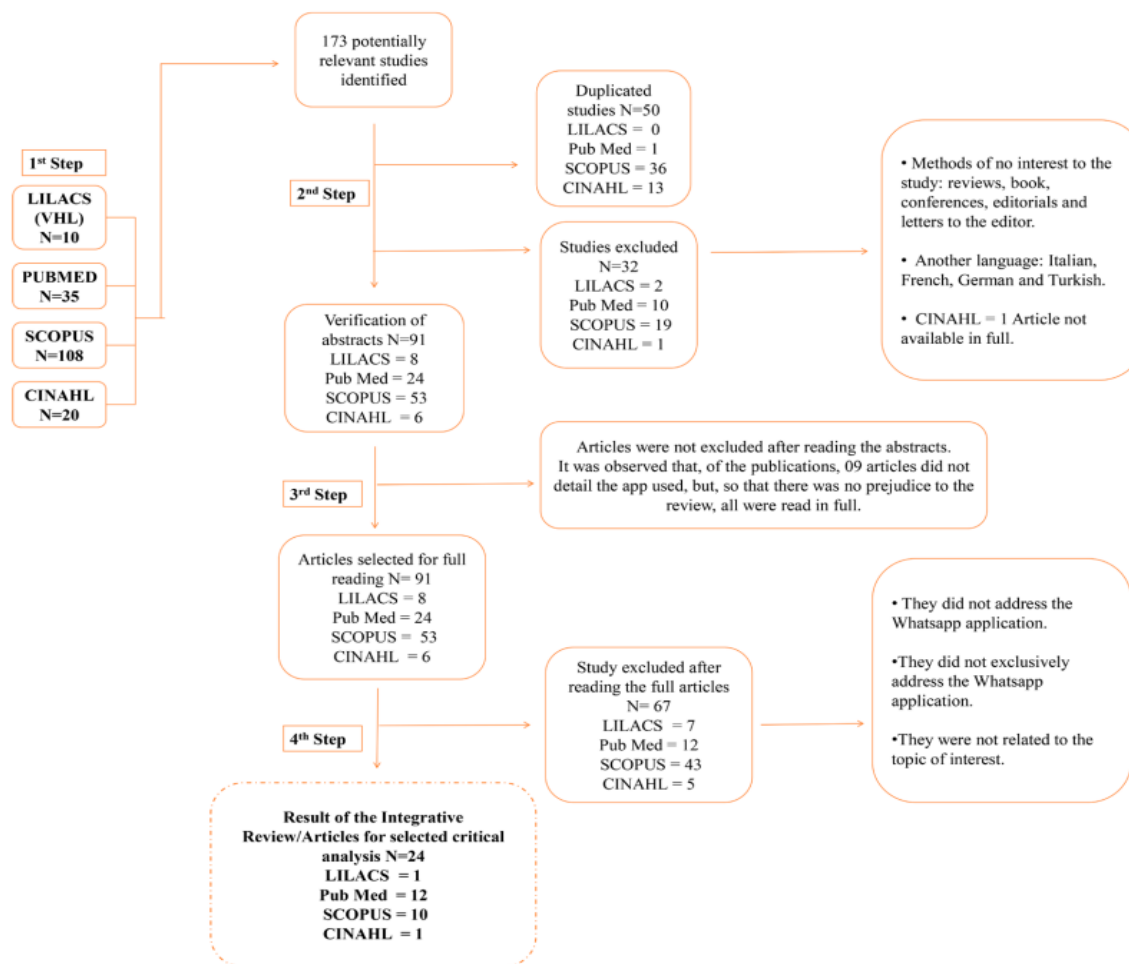
Figure 1 - Flowchart of identification, selection, eligibility and inclusion of studies in the integrative review
Source: Elaborated by the author.

as a communication, teaching and learning tool; b) use of WhatsApp by a healthcare professional at work; c) use of WhatsApp for healthcare education/information exchange between professional and patient.

Thus, to facilitate the presentation and organization of the results of the articles, a summary of the 24 articles selected and included in this integrative review was created in Figure 3, with a description of the objectives, WhatsApp usage strategy and main results.

DISCUSSION

The results found contribute to the increase in knowledge about the applicability of the WhatsApp Messenger tool in healthcare, mainly because, in national and international literature, there are few studies on this theme, due to the application's own contemporaneity.

Some common aspects found in the analysis categories are highlighted as facilitating features of WhatsApp:

low cost, easy access, and high popularity, which favors the approach of interlocutors. The information is shared in a compact and instantaneous way, in high resolution text, audio and video formats. Another function worth mentioning is the creation of groups. The administrator creates a group on a specific theme and/or objective and decides who joins. These features and functions were decisive for the choice and implementation of this application in the studies presented.[3,11]

Use of Whatsapp by healthcare professionals/students as a communication, teaching and learning tool

The main results found in the five (A1, A2, A3, A8 and A15) articles that contemplate this category show that the use of the application is considered the fastest, most dynamic, and productive way of establishing contact in the clinical environment.[3,5,12-14]

Figure 2 - Characteristics of the studies selected in the literature review and level of evidence

Article	Year	Database	Country	Target Public	Study Type	Evidence Level
A1[5]	2016	LILACS	Brazil	Dentistry students	Quantitative - evaluative	6
A2[3]	2017	PUBMED	United Kingdom	Medical students	Quantitative-qualitative-evaluative study	6
A3[12]	2016	PUBMED	Israel	Otorhinolaryngologist Doctors Patients	Cross-sectional	6
A4[15]	2016	PUBMED	Turkey	Emergency doctor	Cross-sectional study	6
A5[31]	2016	PUBMED	Italy	Dentists, dental assistants, doctors, and patients	Qualitative- exploratory descriptive	6
A6[20]	2016	PUBMED	India	Laboratory Employees of a Pathology and Medicine Department	Quantitative-descriptive	6
A7[28]	2015	PUBMED	Spain	Pacient (adults)	Clinical trial	3
A8[13]	2015	PUBMED	South Africa	Nursing students	Descriptive exploratory qualitative study	6
A9[21]	2015	PUBMED	Turkey	Emergency doctor and interventional cardiologist	Quantitative-Evaluative	6
A10[24]	2016	PUBMED	Italy	Adolescents undergoing orthodontic treatment and dentists	Clinical trial	3
A11[22]	2015	PUBMED	India	Residents in orthopedics	Quantitative - exploratory descriptive	6
A12[4]	2015	PUBMED	Brazil	Orthopedic surgeons	Quantitative-evaluative	6
A13[7]	2015	PUBMED	United Kingdom	Emergency surgery medical team	Prospective study of mixed methods	6
A14[23]	2017	SCOPUS	Malaysia	All healthcare professionals in a hospital	Cross-seccional	6
A15[14]	2019	PUBMED	France	Resident anesthetists	Prospective randomized study	2
A16[29]	2019	PUBMED	Turkey	Smokers	Randomized clinical trial	2
A17[17]	2019	SCOPUS	Turkey	Maxillofacial surgeons	Descriptive study	6
A18[25]	2019	SCOPUS	South Africa	Doctors	Cross-sectional study	6
A19[18]	2019	SCOPUS	Oman	Doctors	Descriptive study	6
A20[26]	2019	SCOPUS	Morocco	Pathologists	Descriptive study	6
A21[30]	2019	SCOPUS	Cameroon	Type 1 diabetes patient	Randomized clinical trial	2
A22[16]	2019	SCOPUS	Turkey	Cytopathologists	Descriptive study	6
A23[19]	2019	SCOPUS	Turkey	Orthopedists	Qualitative descriptive study	6
A24[27]	2015	PUBMED	India	General practitioner	Descriptive study: case report	6

Source: Elaborated by the author.

Figure 3 - Main results and conclusion of the articles selected in the literature review

Category of analysis	Article	Objective	WhatsApp usage strategy	Main results
Use of Whatsapp by professionals/ healthcare students as a communication, teaching and learning tool	A1[5]	Evaluate the use of the application for educational purposes with graduate students from the Associação Paulista de Cirurgiões Odontológicos.	It is used as a tool for information, education and clinical decision making.	Effective tool in accessing information, in supporting the teaching-learning process and in clinical decisions.
	A2[3]	Demonstrate the viability of message communication in the education of 3rd year students in clinical internship.	Tool used to facilitate communication between students and doctors and its value in clinical practice.	It favors communication between doctors, and its applicability in the clinical environment.
	A3[12]	Examine the experience of using WhatsApp for mobile health purposes.	A group of otolaryngologists and residents was formed.	There was an improvement in accessibility, efficiency, and quality of medical care.
	A8[13]	Review the experiences of students in the Nursing course on improving health education.	Use of the application to integrate the theory and clinical practice of the PHC Module of the elderly program.	It favored information sharing, and academic support to improve teaching and learning.
	A15[14]	Measure the impact of a learning program via WhatsApp on clinical reasoning in resident doctors.	Residents were randomized into WhatsApp and control groups, and WhatsApp received daily teaching.	Its use was associated with worse clinical reasoning due to dispersion in the use of the smartphone, despite a better global appreciation.
Use of Whatsapp by the professional in the healthcare service	A4[15]	Evaluate the use of WhatsApp for communication between consultants and emergency doctors.	The messages sent to medical consultants were images, videos, text and voice messages.	Seventy-four percent of consultations were completed on the app with consultants (65%) outside the hospital.
	A6[20]	Analyze the impact of using WhatsApp on a laboratory management service.	The use of WhatsApp in communication within the pathology laboratory and among workers in the sector.	There was a significant improvement in communication.
	A9[21]	To evaluate the effectiveness of WhatsApp as a method of communication between the emergency doctor at a rural hospital and the cardiologist at the coronary center.	Used for the communication among professionals, in order to perform a pre-diagnosis in patients who have suffered a heart attack in the countryside.	Its use in initial documentation and sending images has been associated with faster care in patients with myocardial infarction.
	A11[22]	Report the impact of WhatsApp as a communication tool.	WhatsApp group as an intradepartmental communication tool.	There were faster and more efficient transfers after the introduction of WhatsApp.
	A12[4]	Evaluate the inter and intra-observer agreement in the initial diagnosis of tibial plateau fractures via WhatsApp image.	Use WhatsApp to evaluate the image of tibial plateau fractures.	Excellent inter- and intra-observer agreement on image evaluation of tibial plateau fractures sent via WhatsApp.
	A13[7]	Evaluate the implementation of WhatsApp messages in emergency surgical teams.	All members of the emergency surgery team (n = 40) used WhatsApp for communication for 19 weeks.	It represents a safe and efficient communication technology.
	A14[23]	Investigate the benefits of using WhatsApp in medical and emergency teams in clinical practice in Malaysia.	Use of WhatsApp in communication during the clinical practice of 307 professionals.	The benefits in clinical practice were associated with the characteristics of use and the type of communication events.
	A17[17]	Evaluate the efficiency of WhatsApp messages as a way of consulting a maxillofacial surgical team.	WhatsApp group composed of senior and trainee surgeons created to discuss cases with text, voice, and image messages.	WhatsApp is a simple, free and practical application that allows efficient consultation when consultants are not in the hospital.
	A18[25]	Describe the use of WhatsApp as a tool to improve the treatment of complicated cases of HIV/TB.	A WhatsApp group was created for clinical discussion on HIV / TB.	The use of WhatsApp in a medical environment is an effective means of communication, learning and support between colleagues and experts.

Continuation...

	A19[18]	Study the use of WhatsApp as a platform to integrate spine care services in Oman.	WhatsApp group, with participants from 8 hospitalsto determine the treatment plans in each case.	It is an effective tool for interhospital referral based on clinical and image data and for quick responses from centers.
	A20[26]	Evaluate whether WhatsApp can be used to get a quick second opinion on histopathological and cytological diagnosis.	A group was created to discuss difficult routine cases, with the participation of 17 pathologists.	Image sharing was considered an easy and quick method to obtain a second opinion and to discuss difficult cases.
	A22[16]	Present the image sharing technique called "high resolution image sharing (HIS)".	Each photograph was sent by conventional and HIS methods on WhatsApp for comparison of the 2 methods.	Sharing high resolution images would take cytopathologists to the next level in WhatsApp queries.
	A23[19]	Evaluate the reliability of radiological images on the elbows of children using WhatsApp compared to images in real size in the system.	The images were sent to 3 orthopedists, who evaluated them independently. Intraandinterobserverreliabilitywascalculatedusing Kappa statistics.	The use of WhatsApp for consulting is a reliable method that can be used in emergency situations for decision making.
Uso do Whatsapp para educação em saúde/ troca de informação entre profissional e paciente	A5[5]	Describe the use of the WhatsApp application to share clinical information on oral medicine.	Images were sent, the clinical impression was made and categorized as traumatic, infectious, neoplastic, autoimmune, or unclassified.	Telemedicine consultation reduced geographical barriers to initial clinical consultation and encouraged specialized examinations.
	A7[28]	Evaluate and compare the effectiveness of a physical exercise program, administered personally, and directed through the application.	The 10-week intervention. The intervention and control groups received 20 sessions with weekly physical activities (aerobics and resistance).	There were no significant differences in any of the variables in the mobile group.
	A10[24]	Evaluate the influence of the application for the maintenance of oral hygiene at home by a group of adolescents who use fixed braces.	The 80 teenagers divided into 2 groups. EGs were instructed to share selfies monthly showing their oral hygiene status.	The integration of new technologies is effective in adhering to adolescents and improving their oral health during orthodontic treatment.
	A16[29]	Evaluate the effect of messages via WhatsApp added to the usual care compared to routine care, on abstinence rates in 1 month.	Contents of the intervention: 60 messages about the action plan and preventing relapse for 3 months.	Support for WhatsApp increases the abstinence rate and has favorable effects on follow-up.
	A21[30]	Evaluate the impact of patient education via WhatsApp on the knowledge of DM1 and the glycemic control of adolescents and young adults.	Intervention of 4 education sessions via WhatsApp compared to the control with its classic monitoring.	Education via the application improved knowledge about DM and reduced complications, with no improvement in blood glucose after 2 months.
	A24[27]	Describe the applicability of WhatsApp in 2 case reports about patients in palliative care.	Family members called the palliative care team via text messages and photos related to the crises. The team drew up a care plan until they arrived at home.	Information sharing has reduced waiting times and facilitated treatment initiation, in addition to avoiding hospitalizations and service logistics

Source: Elaborated by the author.

In study A1, which aimed to verify the use of the WhatsApp application in the daily clinical decisions of graduate students in Dentistry, 78% of the participants used it for professional and academic purposes. Of these, 55% used to answer questions and 17.5% used the opportunity to exchange information and raise discussions in the group formed by the students themselves.[5]

In a complementary way, the benefits of this application stand out as a tool capable of promoting the integration of theory and practice. And as a useful and important tool in accessing information, in supporting the teaching-learning process and in clinical decisions.[5,13]

According to authors, the discussions that took place in WhatsApp groups provide positive learning moments,

when participants can discuss clinical cases and even learn through dialogicity about diagnoses and situations they could face in the future. It is understood that, as this knowledge is shared, the acquired experiences and knowledge exchange will be achieved.[3,12,13]

Another important issue with the use of this application was the presence of teachers and advisors in the debates. The involvement of teachers in the groups created was essential to maintain discussions based on scientific knowledge. All of these associated factors combined with the ability to send messages in real time and instant feedback favored and reinforced the usability of this tool to narrow communication and information exchange between professionals and students.[3,13]

However, a study on the impact of a learning program via WhatsApp on the clinical reasoning of resident doctors identified that the use of the application was associated with worse clinical reasoning. This suggests dispersion of attention related to the use of the smartphone.[14]

Use of Whatsapp by healthcare professionals in the service

This category constituted 54% of the total of selected publications, the most significant of the set. The use of information and communication technologies (ICT), especially Whatsapp, reflects a socio-behavioral change in healthcare services. Due to the lack of their own technological resources capable of transmitting instant images and/or allowing communication in real time, professionals from different specialties have incorporated this application into their work routines as a tool to meet the demands of mHealth's that do not exist in this area.[15,16]

In this perspective, Whatsapp is being applied as a strategy to facilitate daily interactions between professionals in some teams or sectors, providing faster clinical communication. The application of this tool was observed in several types of services, such as the Otorhinolaryngology sector, hospitals and urgent and emergency care services, medical centers specialized in Orthopedics, pathology and clinical analysis laboratory, general hospital, and dental clinics. It is noticed that the applicability of Whatsapp is wide, given the diversity of professionals and services that use them.[17-19]

It is also worth mentioning that, based on this technology, there was a significant improvement in communication between service professionals, in the form of sharing diagnoses, patient information, exam requests, photographic evidence, accident information, critical alerts and duty lists.[20,21]

Another benefit worth mentioning is the exchange of information between professionals who are in the service and those who are far away as specialists. The possibility of immediate contact provided by the application narrows the distance not only between team members, but also between those who are a reference for some specialty. This favors faster care for patients in remote regions and/or in places without healthcare services with more advanced support.[21-24]

The application represents a safe and efficient communication technology. With it, it is possible to improve internal and external work relations, thus ensuring better functioning of healthcare services. In the long term, and from the application of this tool and the establishment of protocols and routines, more benefits will be realized.[19,25,26]

Use of Whatsapp for healthcare education/information exchange between professional and patient

The articles in this category represent 25% of the total sample. They concern the areas of expertise of the professionals described in the studies, for example: otorhinolaryngologist, dentists, oral healthcare assistant, physical educator, and palliative care team (doctor, nurse, social worker).

It is worth mentioning that not all articles in this category describe how professional-patient interaction occurs through Whatsapp and only report the applicability of this tool for this function, just as it happens in article A3. However, the other articles had the direct participation of patients. Their profile varied from adolescents to the elderly, indicating that the use of this tool goes beyond the young audience.[27-30]

Zotti et al.[24] describe the use of the application for the domestic maintenance of oral hygiene in a group of adolescents who use fixed braces of the multibracket type. From the dentists' guidelines, young people shared selfies of their smiles, weekly, as an effective and lasting way to improve the oral hygiene compliance of adolescents who use orthodontic appliances.[24] This innovative approach by the dental team was able to decrease the incidence of white spot lesions during the first year of orthodontic treatment.[24]

Still on the dental topic, Petruzzi and De Benedittis[31] described the use of the application as a consultation tool, which provides the sharing of clinical information for the prescription of medications. This study analyzed care related to oral health performed by sending photos to the reference professional. Patients who received diagnoses and prescriptions made by the application were

also evaluated face to face and the diagnoses were compared. There was agreement between the evaluations, which reinforces the effectiveness of this tool.[31]

In turn, Dhiliwal and Salins[32] described the applicability of Whatsapp in two case reports about patients in palliative care. Report one details the case of a 60-year-old woman with a history of metastatic carcinoma in symptom control and palliative support care.[32] Case two is about a 64-year-old man with an advanced stage of stomach adenocarcinoma with peritoneal metastasis, bilateral pleural effusion, and ascites, accompanied by the Department of Palliative Medicine for symptom control and ongoing supportive care.[32]

In both cases, the patients were treated at home and monitored by the palliative care team through Whatsapp. This follow-up was also mediated by the patients' family members, who, in times of complications, called the team, sending text messages and photos about the patients' acute crises. When the palliative care team received these notifications, they elaborated a care plan that ranged from orientations given to family members to the displacement of the professional to the patient's residence. This method avoided both the unnecessary displacement of the patient and that of the palliative care team. In addition to minimizing unnecessary patient transport to the hospital, it prevents hospitalization and unusable investigations and minimizes costs and logistics involved in the care process.[32]

Another applicability of Whatsapp is to use it as an environment for healthcare education. In A7, the authors conducted a clinical trial with educational intervention on physical activity through the application. The intervention consisted of sending aerobic exercises, muscle strengthening and strength. The orientation of the exercises was performed via application in one group and in the other group in person, in order to verify the effectiveness of the intervention by this tool. Although the study did not present significant differences in the results of patients who participated in the intervention via Whatsapp, it demonstrated the viability of this tool for health education.[28]

In study A3, which describes the experience and practices that rule the use of Whatsapp in the professional-patient interaction, 96% of the doctors who participated in the survey reported using the application, 82% use it to transfer medical information and 71% for patient care and consultation. Despite the lack of details on how Whatsapp is used, the importance and popularity of this tool are notorious.[12]

As a limitation of the study, it is possible to highlight the scarcity of publications with the theme of health-care applications, especially Whatsapp. Most of the articles found described the use of other applications or social networks. Furthermore, with the application of the work selection criteria, a low level of evidence of the articles selected to compose the integrative review was observed, corroborating the need to conduct future research on this issue. Thus, even in the face of the positive positioning of the selected studies, it is necessary to develop research with more robust levels of evidence in order to investigate the usability of Whatsapp in healthcare.

Another limitation was the exclusion of three articles that were not in the previously established languages, which may have compromised the discussion of this integrative review, given that European and Eastern countries have more advanced literature in this area.

CONCLUSION

WhatsApp is considered an effective, accessible, dynamic, and low-cost communication tool, capable of reaching diverse audiences. In this sense, healthcare professionals and services found in this tool resources capable of meeting the communication demands existing between professionals in a service and even between professionals and patients.

In healthcare services, WhatsApp gained prominence for its ability to send instant messages and images and obtain real-time feedback from professionals, which traditional tools such as e-mail and phone calls do not allow. The application was also able to overcome barriers of time and space, bringing the patient closer to the healthcare service, enabling faster and more targeted guidance and assistance about existing demands.

However, it is emphasized that WhatsApp is not a substitute for clinical examination and only plays an additional support role in patient care. In addition, the practice of using this tool requires some precautions, such as confidentiality of data and information of patients in possession of health professionals.

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