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ELDERLY PEOPLE AND DIGITAL INCLUSION: MOBILE APPS AVAILABLE FOR DOWNLOAD ON SMARTPHONES

Pessoa idosa e inclusão digital: aplicativos móveis disponíveis para download em smartphones

Personas mayores e inclusión digital: aplicaciones móviles disponibles para descargar en smartphones

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RESUMO

Objetivo: caracterizar os aplicativos móveis para o cuidado e bem estar da pessoa idosa disponíveis para *download* em *smartphones* **Método:** estudo transversal realizado nos sistemas operacionais *Android* e *iOS*. Para busca, foram utilizados os termos “idoso”, “pessoa idosa” e “terceira idade”. Realizou-se estatística descritiva, expressa por frequências absolutas e relativas. **Resultados:** foram identificados 43 aplicativos, dos quais 18 (41,8%) estavam na categoria saúde e 11 (25,6%) na medicina, o acompanhamento da pessoa idosa e estimulação cognitiva foi o subtema de 13 (30,2%) aplicativos. Observou-se que 38 (88,4%) aplicativos foram criados entre os anos de 2013 e 2023. Quanto a variável instituição/órgão que desenvolveram 31 (72,1%) pertencem a instituições privadas e 12 (27,9%) a instituições públicas e sem fins lucrativos. **Conclusão:** sugere-se desenvolvimento de aplicativos por instituições públicas que abordem as lacunas existentes, com olhar no processo de inclusão social da pessoa idosa, fundamentado na concepção de sociedade inclusiva.

DESCRITORES: Idoso; Saúde do idoso; Tecnologia; Aplicativos móveis; Smartphone.

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ABSTRACT

Objective: to characterize mobile applications for the care and well-being of the elderly that are available for download on smartphones. **Method:** a cross-sectional study was carried out on the Android and iOS operating systems. The search terms “elderly (*idoso*),” “elderly person (*peessoa idosa*),” and “third age (*terceira idade*)” were used. Descriptive statistics were performed and expressed as absolute and relative frequencies. **Results:** Forty-three applications were identified, 18 (41.8%) of which were in the health category and 11 (25.6%) in the medicine category. Thirteen (30.2%) applications focused on monitoring the elderly and cognitive stimulation. It was observed that 38 (88.4%) of the applications were created between 2013 and 2023. Regarding the institution/developer variable, 31 applications (72.1%) belonged to private institutions, while 12 applications (27.9%) belonged to public and non-profit institutions. **Conclusion:** It is recommended that public institutions develop applications that address existing gaps and focus on the social inclusion of the elderly based on the concept of an inclusive society.

DESCRIPTORS: Elderly; Elderly health; Technology; Mobile apps; Smartphone.

RESUMEN

Objetivo: caracterizar las aplicaciones móviles para el cuidado y el bienestar de las personas mayores, disponibles para su descarga en smartphones. **Método:** estudio transversal realizado en sistemas operativos Android e iOS. Para la búsqueda se utilizaron los términos “anciano”, “persona mayor” y “tercera edad”. Se realizó estadística descriptiva, expresada mediante frecuencias absolutas y relativas. **Resultados:** se identificaron 43 aplicaciones, de las cuales 18 (41,8%) fueron de la categoría salud y 11 (25,6%) de medicina, siendo el seguimiento del anciano y la estimulación cognitiva el subtema de 13 (30,2%) aplicaciones. Se observó que entre 2013 y 2023 se crearon 38 (88,4%) solicitudes. Respecto a la variable institución/organismo que las desarrolló, 31 (72,1%) pertenecen a instituciones privadas y 12 (27,9%) a instituciones públicas y sin fines de lucro. **Conclusión:** se sugiere que las instituciones públicas desarrollen aplicaciones que aborden las brechas existentes, con foco en el proceso de inclusión social de las personas mayores, basado en el concepto de sociedad inclusiva.

DESCRIPTORES: Anciano; Salud de las personas mayores; Tecnología; Aplicaciones móviles; Teléfono inteligente.

INTRODUCTION

This worldwide increase brings with it different demands for attention, such as the need to keep it as an active participant in society. To achieve this, accessible alternatives that enable interaction in the virtual domain must be sought out.¹

In Brazil, the percentage of elderly individuals with internet access grew from 68% in 2018 to 97% in 2021. This increase is also associated with the scenario of the Covid-19 pandemic, during which smartphones and mobile applications became tools for monitoring information and promoting self-care for individuals in social isolation.²

The increase in smartphone use among the aging population has given rise to new markets and applications aimed at this audience, primarily focusing on the health and care of the elderly. These technologies have become tools for improving and promoting access to health for this population. Digital technologies, such as apps, can influence lifestyles, promote the early detection of disease symptoms, and encourage healthy aging. Furthermore, considering the variety of applications aimed at younger people, gerontology must investigate the gaps in producing

this technology for the elderly to stimulate their protagonism and empowerment in health.³

In this sense, describing existing applications on the subject can help identify which application profiles are missing, what information is absent from existing applications, and which types of audiences they are aimed at. Additionally, researchers in gerontology and technology, as well as startups and companies involved in technological innovation for aging, can benefit from characterizing existing applications to remodel or plan new products.

Although a study mapped scientific production on mobile applications for self-management of care for the elderly, the search was limited to scientific databases and analysis of articles on mobile applications.⁴ However, no study was found that identified existing applications in virtual smartphone stores. Therefore, there is a need for a study that considers this knowledge to contribute to identifying gaps, making recommendations for new studies, and providing guidance for research on the elderly and digital technology use.

Thus, this study aimed to characterize mobile applications for the care and well-being of the elderly that are available for download on smartphones.

METHOD

A cross-sectional study was conducted from October to November 2023 based on an online search of virtual mobile app stores for smartphones with Android and iOS operating systems. The study population consisted of the applications available in these stores, which were selected based on their content about the elderly. Applications that were not available for downloading in free or paid forms were excluded.

Virtual stores for smartphones with Android and iOS operating systems were accessed to search for mobile applications. In each store, searches were conducted using the terms “elderly (*idoso*)”, “elderly person (*pessoa idosa*)”, and “third age (*terceira-idade*)” individually. Applications found in duplicate during searches with different terms were counted only once. All identified applications were downloaded. Two members of the research team conducted the search individually and separately.

Figure 1 shows the application selection flowchart.

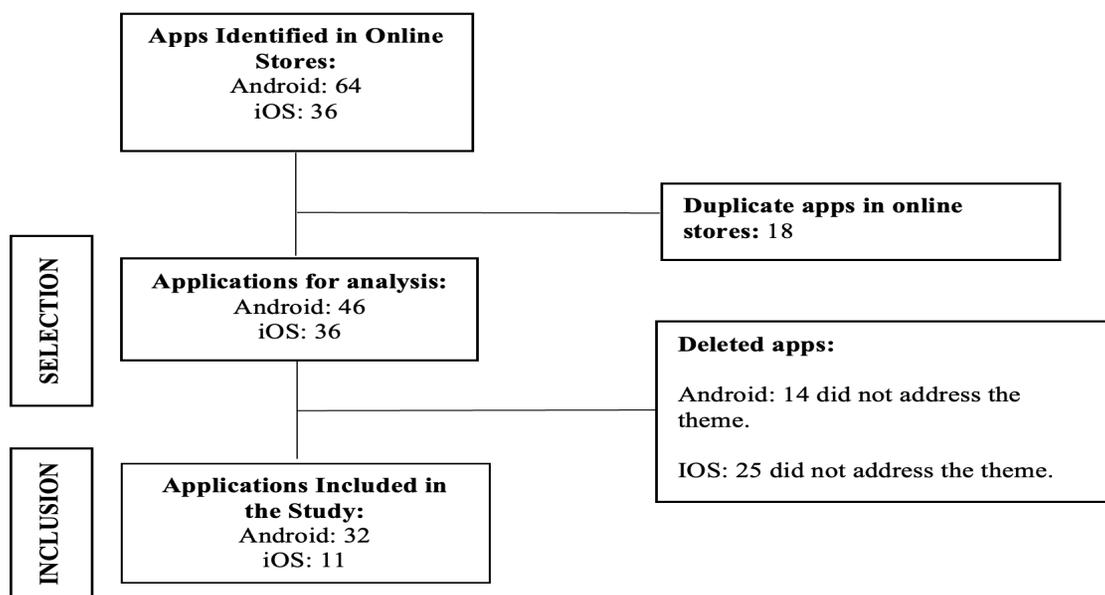


Figure 1 - Flowchart of the Application Selection Process Belo Jardim, PE, Brazil, 2025
Source: The Author, 2025

An instrument developed for this study was used for data collection. It consisted of 11 variables about the application: operating system; country of production; language; year of creation; year of update in the virtual store; subtheme addressed regarding the elderly; content classification; agency that owns the license to use the application; access type (free or paid); target audience; and accessibility for people with disabilities. These variables were chosen because they consist of information that can be obtained from the applications themselves and/or the virtual store. The data was entered into Microsoft Excel 2010 spreadsheets. Descriptive

statistics were used for the analysis, expressed by absolute and relative frequencies.

Approval by the Research Ethics Committee was not necessary since the analyzed content was in public domain.

RESULTS

A total of 43 mobile applications were identified. Of those, 32 (74.4%) belonged to the Android operating system and 11 (26.6%) belonged to iOS. The sub-themes and categories are presented in Table 1.

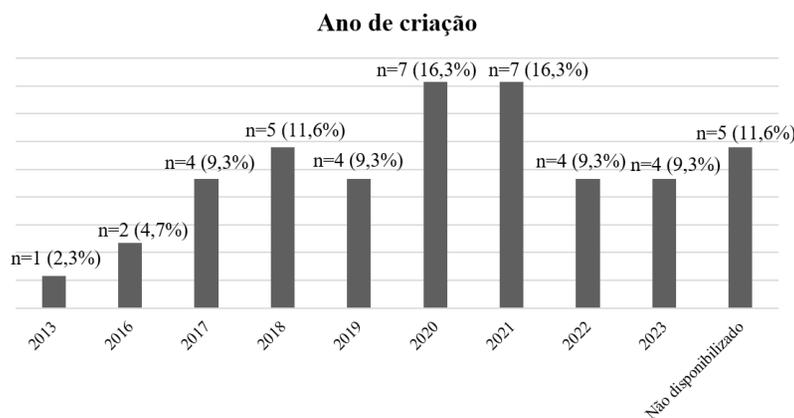
Table 1 - Mobile applications about the elderly available for smartphones, according to subtheme and category. Belo Jardim, PE, Brazil, 2025

VARIABLES	N	(%)
Subtheme		
Elderly Accompaniment	13	30,2%
Physical Exercise	3	7%
Fall Prevention	3	7%
Cognitive Stimulation	13	30,2%
Search for health professionals and caregivers	4	9,3%
Search for health services	2	4,6%
Health and Healthy Aging Fact Sheet	1	2,4%
Health and Multimorbidity Management Fact Sheet	4	9,3%
Category		
Social	1	2,4%
Medicine	11	25,6%
Health	18	41,8%
Lifestyle	1	2,4%
Utility	8	18,5%
Reference	4	9,3%

Source: The Author, 2025

Regarding the target audience, 21 (48.8%) of the mobile applications were aimed at elderly patients, 11 (25.6%) at elderly people in general, and 11 (25.6%) at health professionals. Regarding the year of creation, 38 applications (88.4%)

were created between 2013 and 2023, while five applications (11.6%) did not provide this information (Figure 2). Of these applications, one (2.3%) was updated in 2016, one (2.3%) in 2020, one (2.3%) in 2022, and 40 (93.1%) in 2023.

Figure 2 - Mobile applications for elderly people, available for smartphones, by year of creation. Belo Jardim, PE, Brazil, 2025

Source: The Author, 2025

Table 2 shows the accessibility characteristics of the applications for people with disabilities, the type of access, the content classification, the country of origin, and the languages available.

Table 2 - Mobile applications for elderly people, available for smartphones, listed by accessibility, type of access, classification, country of origin, and language. Belo Jardim, PE, Brazil, 2025

VARIABLES	N	(%)
Accessibility		
Yes	39	90,7%
No	1	2,3%
Not applicable	3	7%
Access Type		
Free	42	97,7%
Paid	1	2,3%
Indicative Rating		
Free	29	67,5%
12 years	13	30,2%
17 years	1	2,3%
Country of Origin		
United States of America	31	72,1%
Brazil	11	25,6%
Italy	1	2,3%
Languages Available		
English	20	46,5%
Portuguese	6	14%
Spanish	3	7%
English, Portuguese and Spanish	11	25,6%
French	1	2,3%
Italian	1	2,3%
Port., Eng., Esp. Ital., Fren., Ger., Chin., Greek*	1	2,3%

*Portuguese, English, Spanish, Italian, French, German, Chinese and Greek.
Source: The Author, 2025

Of the mobile applications made available to the elderly, 31 (72.1%) were developed by private institutions and 12 (27.9%) by public and nonprofit institutions. This result is detailed in Table 3.

Table 3 - Applications for the elderly, available for smartphones, according to the type of institution/agency to which they are linked to. Belo Jardim, PE, Brazil, 2025

Type of institution/agency	N	(%)
Private institutions	31	72,1%
State health agency	1	2,3%
Federal health agency	1	2,3%
Public University Hospital	5	11,7%
Nonprofit body	4	9,3%
International Federal Government	1	2,3%
Total	43	100%

Source: The Author, 2025

DISCUSSION

Mobile applications aimed at the elderly are innovative digital technologies. They help solve accessibility problems and provide entertainment, health guidelines, and increased connectivity. It is important to make this technology available to the elderly to break the paradigm of digital exclusion for this demographic.

Among the analyzed applications, sub-themes related to monitoring, cognitive stimulation, and health predominated. Mobile applications for the health and care of the elderly can contribute significantly to improving the health of this population. They can be used as instruments for monitoring, informing, and promoting healthy habits.⁵ In this sense, the diversity of sub-themes found emerges as a strategy that empowers the target audience to care for their own health. It also serves as an entertainment resource that contributes to their digital inclusion. Additionally, these resources can be used in health service intervention strategies by nurses and other members of the multidisciplinary team. Nevertheless, it is important to consider the user's autonomy and decision to use the application in their daily life.

The applications analyzed were intended for the elderly, health professionals, and family members. This is a relevant result, as this type of digital technology benefits not only the elderly population but also family members, caregivers, and professionals.⁶ Thus, the entire care network for the elderly can benefit from this technology, offering better care and positively impacting the health and quality of life of this population. Users must decide which application best meets their needs from the available options. It may be necessary

to consult a professional to ensure the technology meets the planned objectives.

Most of the identified applications were designed between 2020 and 2021. The surge in app development during this period can be attributed to various factors, particularly the lifestyle and needs changes of elderly people during the pandemic. Digital technologies have favored and expanded social interactions through the internet and have helped prevent depression and social isolation, particularly among those with physical limitations. In addition to stimulating brain activity, digital technologies offer different possibilities for social interaction for all age groups.⁷ As a result, post-pandemic applications significantly improve the quality of life for the elderly, promoting well-being, facilitating access to services and information, combating loneliness, stimulating the mind, ensuring safety, and providing an accessible and inclusive technological experience.⁸

In terms of accessibility and type of access, over 90% of the applications were accessible to the elderly and publicly available. This result underscores the importance of promoting inclusion and ensuring access to the benefits of technology for people of all abilities and financial backgrounds. Another study emphasizes the need for more research addressing interactivity issues, particularly accessibility and usability, to support designing better applications for the elderly.⁹

While the identified applications stand out for their accessibility and free access, it is emphasized that other measures must be planned to guarantee the elderly's full and effective digital inclusion. This study did not evaluate the applications' technical accessibility features, such as adequate font size, image adaptation, screen brightness adjustment, and

command button size. Therefore, further research should focus on appreciating other elements and variables of applications developed for elderly people.

Most of the apps developed were from the United States, followed by Brazil. This result may be associated with economic, cultural, technological, and regulatory factors that foster innovation and entrepreneurship. In Brazil's case, the history of technological innovations is intertwined with the country's economic and social development.¹⁰

To boost economic growth, the government has encouraged innovation in sectors such as agriculture and industry. Despite an initial scenario marked by late adoption and structural challenges, the country has emerged as a promising hub of technological innovation. This has led to the development of applications that address the diverse needs of the population.¹¹ It should be noted, however, that much remains to be done in terms of digital and social inclusion in the process of technological innovation. Public policies and investments in education are urgently needed so that the elderly can benefit.

The apps identified were available in several languages. However, most were available in English, Portuguese, and Spanish. A study evaluating mobile applications for the pandemic yielded similar results.¹² The availability of apps in different languages eliminates language barriers and promotes digital accessibility for this age group, fostering independence, engagement, and self-confidence.

Regarding the types of institutions/bodies to which the apps are linked, most are private institutions. This may be because private companies often have access to financial resources and technological talent, allowing them to innovate and develop high-quality applications.¹³ With access to venture capital, bank financing, and private investments, these institutions can strategically invest in the research, development, and marketing of applications to create robust, competitive products with attractive consumer potential. Additionally, they are often driven by the desire for profit and return on investment.¹⁴

Investing in public institutions to develop apps is essential to meeting society's needs in a comprehensive, inclusive, and equitable manner. The growing number of public institutions developing applications worldwide reflects a rising awareness of technology's potential to enhance government service delivery, promote transparency and civic engagement, and guarantee equitable access to public information and resources for all citizens.^{15,16}

Additionally, apps developed by public institutions can significantly improve government service efficiency by automating processes, simplifying procedures, and providing direct communication channels between citizens

and government agencies. This reduces operational costs, eliminates unnecessary bureaucracy, and improves the quality and speed of services provided. This benefits not only the elderly but also increases the efficiency and productivity of the public sector as a whole.

This research presents limitations of using only Android and iOS operating systems to perform searches in mobile applications so that other available data in different systems may be identified. Future studies are suggested to analyze the usability of existing applications so that the benefits proposed by the applications to the elderly, their family members, and professionals are proven and real.

CONCLUSION

Mobile applications aimed at the elderly, which are available for download on smartphones, were mostly created between 2020 and 2021. They are accessible and free. The target audience includes not only elderly people, but also health professionals and family members. The applications are available in Portuguese, English, and Spanish, and were created by private institutions.

It is suggested that public institutions develop applications that address existing gaps with the goal of socially including the elderly based on the conception of an inclusive society and respect for and acceptance of the unique communication processes of this age group.

REFERENCES

1. Sales MB, Souza JJ, Sales AB. Idosos, aplicativos e smartphone: uma revisão integrativa. *Revista Kairós-Gerontologia*. [Internet]. 2019 [cited 2025 jan 15];22(3). Available from: <https://doi.org/10.23925/2176-901X.2019v22i3p131-151>.
2. Confederação Nacional de Dirigentes Lojistas (CNDL). Número de idosos que acessam a internet cresce de 68% para 97%. *Apona pesquisa CNDL/SPC Brasil*. [internet] 2021 [cited 2025 feb 5]. Available from: <https://cndl.org.br/politicaspUBLICAS/numero-de-idosos-que-acessam-a-internet-cresce-de-68-para-97-apona-pesquisa-cndl-spc-brasil/>.
3. Machado MAC, Martins ALS, Amaral JDMS, Aldunate JC, Militão AG, Sampaio DT, et al. Promoção de envelhecimento saudável por meio de aplicativo de mensagens instantâneas. *Revista Eletrônica Acervo Saúde*. [Internet]. 2023 [cited 2025 jan 15];23(11). Available from: <https://doi.org/10.25248/reas.e14049.2023>.

4. Gomes MLF, Fernander CS, Sousa MGA, Silva RLB, Silva IJMC, Barros LM. Aplicativos móveis direcionados aos idosos para autogerenciamento do cuidado: revisão de escopo. *Revista Cuidarte*. [Internet]. 2023 [cited 2025 jan 17];11(14). Available from: <https://doi.org/10.15649/cuidarte.2594>.
5. Amorim DNP, Sampaio LVP, Carvalho GA, Vilaça KHC. Aplicativos móveis para a saúde e cuidado de idosos. *Reciis – Rev Eletron Comun Inf Inov Saúde*. [Internet]. 2018 [cited 2025 jan 17];12(1). Available from: <https://doi.org/10.29397/reciis.v12i1.1365>.
6. Brites AS, Caldas CP, Motta LB, Sztajnberg A, Stutzel MC, Filippo MP, et al. Suporte social e assistencial de pessoas com demência e seus cuidadores através de um aplicativo móvel de saúde. *Research, Society and Development*. [Internet]. 2022 [cited 2025 jan 18];11(2). Available from: <https://doi.org/10.33448/rsd-v11i2.26073>.
7. Andrade SJV, Silva E JL, Scortegagna PA. The Challenge of Remote Learning with the Elderly during the Covid-19 Pandemic. *Educação & Realidade*. [Internet]. 2023 [cited 2025 feb 18];48. Available from: <https://doi.org/10.1590/2175-6236119072vs02>.
8. Neto Santos TP, Vega MSRG, Pires TSJ, Enéas ELS, Pinheiro EG, Medeiros RA, et al. The use of digital technologies by the elderly during the covid-19 pandemic: a scoping review. *Revista Ibero-Americana de Saúde e Envelhecimento*. [Internet]. 2024 [cited 2025 feb 18];10(2). Available from: [http://dx.doi.org/10.60468/riase.2024.10\(02\).683.50-75](http://dx.doi.org/10.60468/riase.2024.10(02).683.50-75).
9. Gomez-Hernandez M, Ferre X, Moral C, Villalba-Mora E. Design Guidelines of Mobile Apps for Older Adults: Systematic Review and Thematic Analysis. *JMIR Mhealth Uhealth*. [Internet]. 2023 [cited 2025 feb 21]; 21(11):e43186. Available from: <http://dx.doi.org/10.2196/43186>.
10. Barbosa RF, Pereira SA, Oliveira RC. Ferramentas de comunicação para a disseminação da propriedade intelectual: análise comparativa de produtos didáticos. P2P e inovação. [Internet]. 2025 [cited 2025 feb 21];11(2):e-7429. Available from: <http://dx.doi.org/10.21728/p2p.2025v11n2e-7429>.
11. Santos MCP, Neves WR, Piffer DM. Estratégias de Incentivo a Inovação Tecnológica no Setor Público. *Revista de Ciências Humanas da UNIPAR*. [Internet]. 2023 [cited 2025 feb 22];31(2). Available from: <http://dx.doi.org/10.25110/akropolis.v31i2.013>.
12. Galindo Neto NM, Sá GGM, Barbosa LU, Pereira JCN, Henriques AHB, Barros LM. COVID-19 and digital technology: mobile applications available for download in smartphones. *Texto Contexto Enferm*. [Internet]. 2020 [cited 2025 feb 23];(29):e20200150. Available from: <https://doi.org/10.1590/1980-265X-TCE-2020-0150>.
13. Gordon JL, Stallivieri F. Embrapii: um novo modelo de apoio técnico e financeiro à inovação no Brasil. *Rev. Bras. Inov*. [Internet]. 2019 [cited 2025 feb 23];18 (2). Available from: <https://doi.org/10.20396/rbi.v18i2.8653648>
14. Armiliato KAG, Yamaguchi CK, Facó JFB, Rosa CG. Inovação nas pequenas empresas brasileiras: uma revisão sistemática. *Revista Contribuciones a las Ciencias Sociales*. [internet] 2020 [cited 2025 feb 23];13(12). Available from: <https://ojs.revistacontribuciones.com/ojs/index.php/clcs/article/view/128>.
15. Oliveira EM. Governo móvel no Brasil: uma análise do estado da arte no desenvolvimento de aplicativos móveis por instituições do setor público brasileiro. [Doutorado em Comunicação Social]. Salvador (Brasil): Universidade Federal da Bahia; 2020. [cited 2025 feb 27]. Available from: https://repositorio.ufba.br/bitstream/ri/34960/1/Tese_EuricoMatos2020.pdf.
16. Brasil. Lei nº 10.973, de 2 de dezembro de 2004. Dispõe sobre a inovação tecnológica nas empresas e institui o Sistema Nacional de Inovação. [internet] 2004; [cited 2025 feb 27]. Available from: https://www.planalto.gov.br/ccivil_03/leis/2004/110.973.htm.
17. Latif A, Baig AAM, Wajid SA, Ali SS. Frequency of median nerve tightness and its association with upper limb functions among smartphone users of a public sector university, Karachi. *J Pak Med Assoc*. [Internet]. 2022 [cited 2025 feb 27];72(8). Available from: <https://doi.org/10.47391/JPMA.3824>.