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Jaqueline de Araújo Rezende Batistuta
ORCID: 0000-0002-0050-8280
University of São Paulo
E-mail: jaquelinebatistuta@usp.br

Márcia Mazzeo Grande
ORCID: 0000-0002-2078-0572
University of São Paulo
E-mail: mgrande@usp.br

Evandro Marcos Saidel Ribeiro
ORCID: 0000-0001-7213-0240
University of São Paulo
E-mail: esaidel@usp.br

Aldaísa Cassanho Forster
ORCID: 0000-0002-2720-5802
University of São Paulo
E-mail: acforste@fmrp.usp.br

MOBILE APPLICATIONS AND WOMEN'S HEALTH: A LITERATURE REVIEW

APLICATIVOS MÓVEIS E SAÚDE DA MULHER: UMA REVISÃO DE LITERATURA

APLICACIONES MÓVILES Y SALUD DE LA MUJER: UNA REVISIÓN DE LA LITERATURA

CRediT

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ABSTRACT
This study aims to map and analyze the current landscape of mobile health applications designed for women's health within the framework of Primary Health Care. The review seeks to provide a comprehensive perspective on the integration of these digital technologies in health promotion and clinical care, offering valuable insights for healthcare professionals, researchers, and developers of innovative health solutions. A literature review was conducted in accordance with PRISMA guidelines, with searches performed across four major databases: PubMed, SciELO, Scopus, and Web of Science. Eligible studies included articles published in Portuguese, English, or Spanish, explicitly focusing on mobile applications for women's health. The selection process involved a two-stage approach: an initial screening of titles and abstracts, followed by an in-depth full-text review of the selected studies. Ultimately, 36 studies were included and categorized based on methodological design, study scope, technological functionalities, target population, and key findings. The results indicate that the analyzed mobile applications predominantly address women's health needs in a fragmented manner, lacking structured integration with public health policies or coordinated programmatic actions within healthcare systems.

KEYWORDS: Mobile Applications; Health; Attitude; Women; Primary Health Care.

RESUMO
Este estudo tem como propósito mapear e analisar o panorama atual do uso de aplicativos móveis voltados à saúde da mulher no âmbito da Atenção Primária à Saúde. A investigação busca oferecer uma visão sobre a incorporação dessas tecnologias na promoção e no cuidado em saúde, fornecendo subsídios relevantes para profissionais da área, pesquisadores e desenvolvedores de soluções digitais. Para isso, foi conduzida uma revisão de literatura seguindo as diretrizes do PRISMA, com buscas realizadas nas bases de dados PubMed, SciELO, Scopus e *Web of Science*. Foram incluídos artigos científicos publicados em português, inglês ou espanhol, cujo foco principal fosse o uso de aplicativos móveis para a saúde da mulher. O processo de seleção envolveu duas etapas: triagem de títulos e resumos, seguida da leitura completa dos textos selecionados. Ao final, 36 estudos foram analisados e organizados de acordo com delineamento metodológico, abrangência, funcionalidades tecnológicas, público-alvo e principais achados. Os resultados indicam que os aplicativos selecionados abordam de forma fragmentada as necessidades de saúde da mulher, sem uma articulação clara com políticas públicas ou ações programáticas no contexto dos sistemas de saúde.

DESCRITORES: Aplicativos Móveis; Saúde; Atitude; Mulheres; Atenção Primária à Saúde.

RESUMEN
El presente estudio tiene como objetivo mapear y analizar el panorama actual del uso de aplicaciones móviles orientadas a la salud de la mujer en el contexto de la Atención Primaria de Salud. La investigación ofrece una visión crítica sobre la incorporación de estas tecnologías en estrategias de promoción y cuidado, aportando insumos relevantes para profesionales, investigadores y desarrolladores de soluciones digitales. Para ello, se realizó una revisión de la literatura conforme a las directrices PRISMA, mediante búsquedas en las bases de datos PubMed, SciELO, Scopus y *Web of Science*. Se incluyeron artículos publicados en portugués, inglés o español, cuyo eje central fuera el uso de aplicaciones móviles relacionadas con la salud de la mujer. La selección se desarrolló en dos fases: cribado de títulos y resúmenes, seguido de lectura completa de los textos elegibles. En total, se analizaron 36 estudios, organizados según diseño metodológico, alcance, funcionalidades tecnológicas, público objetivo y hallazgos principales. Los resultados indican que las aplicaciones analizadas abordan las necesidades de salud de las mujeres de forma fragmentada, sin articulación clara con políticas públicas ni acciones programáticas en los sistemas de salud.

DESCRIPTORES: Aplicaciones Móviles; Salud; Actitud; Mujeres; Atención Primaria de Salud.

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1 INTRODUCTION

The World Health Organization (WHO) emphasizes the importance of Primary Health Care (PHC) considering the specificities of women's health throughout their lives. Addressing gender inequalities in access to health services requires a holistic, evidence-based approach that encompasses not only disease prevention and treatment but also the promotion of equity in care.

Given this scenario, this study seeks to answer the following question: "How have mobile applications been used in the context of women's health?" The main objective is to map and analyze the state-of-the-art use of these technologies in PHC. To this end, a literature review was conducted following the PRISMA guidelines[1]. Scientific articles published in Portuguese, English, and Spanish, located in the PubMed, SciELO, Scopus, and Web of Science databases, were selected using search strategies specific to each database. It is believed that a detailed analysis of eligible studies will enable a comprehensive understanding of the current use of mobile applications in the promotion and care of women's health in PHC, generating valuable information for health professionals, researchers, and technology developers.

2 THEORETICAL FRAMEWORK

Studies indicate that women often face barriers in accessing health services, in addition to facing discrimination and gender-based violence[2]. In this sense, Vieira and Maia[3] highlight the need for a woman-centered approach, recognizing their particularities and specific demands at different stages of life, ensuring comprehensive care through preventive actions, health promotion, diagnosis and treatment of diseases, as well as longitudinal health monitoring.

The incorporation of Information and Communication Technologies (ICT) into healthcare has established itself as an essential strategy to improve process automation and increase safety in healthcare decision-making[4]. Notable among these innovations is the growing adoption of mobile health applications (mHealth), which contribute to the transformation of the healthcare model by facilitating access to health information. Several studies suggest that these applications play a significant role in optimizing clinical outcomes and mitigating risks, in addition to enabling a deeper understanding of the determinants of health and disease[5].

Mobile applications aimed at PHC have focused primarily on the monitoring and management of chronic conditions, especially the tracking, diagnosis, and treatment of these diseases[6]. However, these technologies also represent a valuable opportunity to expand access to information and health services in specific areas of women's health, such as prenatal care, family planning, and prevention of sexually transmitted infections[7]. These applications can offer features such as personalized guidance, symptom tracking, medication reminders, and access to educational content, promoting greater user's autonomy and engagement in their health care[8].

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Despite its potential, the implementation of mHealth to support women's health faces significant challenges. Privacy and security of sensitive data emerge as critical issues to be addressed. Furthermore, digital inequality can limit the impact of these innovations, as women belonging to socially vulnerable or low-income groups may have limited access to the internet and mobile devices, reducing the benefits these tools could offer[9]. Another relevant aspect involves the need to ensure quality and reliability of the information made available in the appications, requiring a careful approach to evaluate the usefulness and accuracy of these resources[10].

During the 71st World Health Assembly, the WHO recognized the potential of digital technologies to strengthen health systems and expand access to health services[11]. However, the organization also emphasized the importance of human interaction and the complementarity between digital solutions and conventional care models, highlighting the need for international cooperation and technology transfer to drive the sustainable development of digital health.

3 METHODOLOGY

The methodology used in the literature review, as well as in the selection of studies obtained from this process, followed the PRISMA guidelines[1]. Four databases were consulted: PubMed, SciELO, Scopus, and Web of Science. The search was carried out between May 7 and 14, 2024, and was conducted using keywords organized into search strings and specific filters for each database:

- PubMed: ("Mobile Applications"[Mesh]) AND "Primary Health Care"[Mesh] AND (woman OR women). Applied filters: Language (English, Portuguese and Spanish);
- SciELO: ("mobile applications" OR aplicativo*) AND ("atenção primária" OR "primary care") AND (woman OR women OR mulher OR mulheres). Applied filters: All indexes;
- *Web of Science*: ("mobile app*" OR "mobile technolog*") AND ("primary care" OR "primary health care") AND (woman OR women). Applied filters: Option: "topics"; Filter: "articles or review articles";
- Scopus: ("mobile app*" OR "mobile technolog*") AND ("primary care" OR "primary health care") AND (woman OR women). Applied filters: Fields: title, abstract and keywords; Filters: “articles” and “reviews”.

These terms were chosen based on their relevance to the research objectives and their frequent use in a preliminary literature review. The inclusion criteria were as follows:

- Only articles were considered;
- Articles published in Portuguese, English or Spanish were accepted;
- The selection focused on studies that addressed the use of mobile applications aimed at women's health.

Studies that focused on anything other than awareness, sanitary education, health self-management, or scheduling medical appointments by users were excluded. The study selection process occurred in two

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phases: in the first, the authors conducted a joint and simultaneous screening, analyzing the titles and abstracts of the articles found. Those considered relevant were then selected for the second phase, which consisted of reading the full texts to validate their suitability. Finally, studies that met the previously established criteria were identified. This process resulted in 36 articles: 12 from PubMed, 13 from Scopus, and 11 from Web of Science. No eligible articles were retrieved from the SciELO digital library.

This research does not require approval from the Research Ethics Committee, in accordance with the guidelines of Resolution No. 510/2016 of the National Health Council, since it is documentary in nature, without direct involvement with human beings, nor access to sensitive data of patients or health professionals.

4 RESULTS

The information from the 36 selected articles was organized in an Excel® spreadsheet, which included data on study identification, following the PRISMA guidelines[1]. This data included: author(s), year of publication, title, study objectives, methodological design, target population, type of mobile application and its functions, main results, benefits, and challenges mentioned. The categories used to group the articles are presented in Chart 1 and considered the following criteria: 1. Study Design: types of epidemiological research, as described by Rouquayrol and Gurgel[12], including systematic review, randomized clinical trial, controlled clinical study, cohort studies, case-control study, cross-sectional cohort and qualitative research; 2. Study Completeness: pilot project or completed research; 3. Use of Technology: features such as appointment and procedure scheduling, health monitoring, risk assessment and decision-making, communication with the care team, and encouraging behavioral change; 4. Target Audience: based on the quality indicators of the new federal co-financing methodology for the Primary Health Care Floor in the Unified Health System (SUS)[13] (Women's Health Care and Care for Pregnant and Postpartum Women); 5. Main Results: emphasis on the application's functionalities, good user adherence to the use of mHealth, impact of the technology, good relation between usefulness and benefit, helpfulness in organizing the health service, and clinical effectiveness. Categories 3 and 5 emerged from the inductive analysis carried out by the authors on the selected articles, with the aim of answering the research question, and were considered appropriate to describe and/or explain the barriers and facilitators observed, as well as the implications related to the evaluation of the intervention[14].

Chart 1. Grouping of articles

Design	Study completeness	Use of technology	Target audience	Main results
Systematic Review	Pilot Project	Appointment and Procedure Scheduling	Women's Health Care	Emphasis on Application's Functionalities

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Randomized Clinical Trial	Completed research	Health Monitoring	Care for Pregnant and Postpartum Women	Good User Adherence to mHealth
Aleatory Clinical Trial		Risk Assessment and Decision-Making		Impact of the Technology
Cohort Studies		Communication with the Care Team		Good Relation Usefulness x Benefit
Case-control Study		Training and Behavioral Change		Usefulness in Organizing Health Care
Cross-section Cohort Study				Good Response in Clinical Use
Qualitative Study				

Source: research data (2025).

After reviewing and extracting the fundamental aspects of each article, they were categorized. This enabled a systematic and structured evaluation of the literature in question, contributing to the comparison between studies, the identification of patterns, knowledge gaps, and emerging trends. Next, we present a qualitative and quantitative analysis of this process, highlighting the frequencies, distributions, and concentrations across the different categorical dimensions.

4.1. Study design

As presented in Table 1, the study designs are predominantly composed of Randomized Clinical Trials (RCT), with 20 studies (55.6%), followed by Cross-Sectional Cohort Studies (6 studies, 16.7%) and Cohort Studies (4 studies, 11.1%). Only 1 study (2.8%) was classified as a Aleatory Clinical Trial and 3 studies (8.3%) as Qualitative. The Systematic Review (2 studies, 5.6%) completed the scope of the design used.

Table 1 - **Distribution of the methodological design of the studies (n = 36)**

Type of design	n	%
Randomized Clinical Trial (RCT)	20	55.6%
Cross-Sectional Cohort Study	6	16.7%
Cohort Study	4	11.1%
Qualitative Study	3	8.3%
Aleatory Clinical Trial	1	2.8%
Systematic Review	2	5.6%

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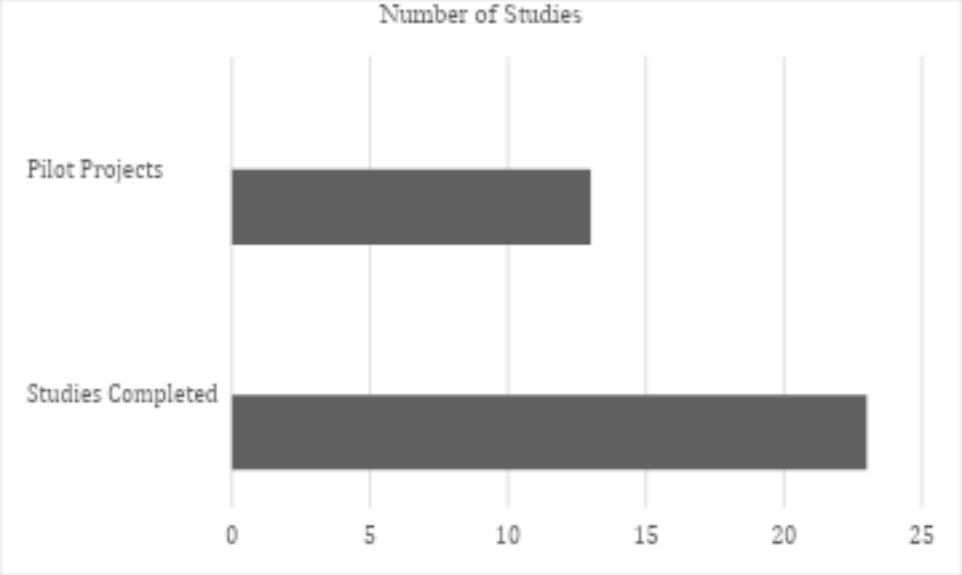
Total	36	100%

Source: research data (2025).

4.2. Study Completeness

The completeness analysis shows that the majority of the articles evaluated are completed studies (23 studies, 63.9%), demonstrating a substantial body of research that presents solid conclusions on the use of mobile applications in health. On the other hand, a significant portion of the articles (13 studies, 36.1%) refers to pilot projects, characterizing research still in the preliminary stages, aimed at the initial assessment of the feasibility and applicability of such technologies (Figure 1).

Figure 1 - Classification of studies according to the development stage (n = 36)



Source: research data (2025).

4.3. Use of Technology

Table 2 shows that the application of the mHealth evaluated is predominantly related to the area of Training and Behavioral Change (18 studies, 50%), followed by the area of Health Monitoring (8 studies, 22.2%). The subcategory Risk Assessment and Decision Making is cited in 5 studies (13.9%), while Appointment and Procedure Scheduling is mentioned in 2 studies (5.6%) and Communication with the Care Team in 3 studies (8.3%).

Table 2 - Distribution of the studies according to the use of technology (n = 36)

Use of Technology	n	%

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Training and Behavioral Change	18	50%
Health Monitoring	8	22.2%
Risk Assessment and Decision-Making	5	13.9%
Appointments and Procedures Scheduling	2	5.6%
Communication with Care Team	3	8.3%
Total	36	100%

Source: research data (2025).

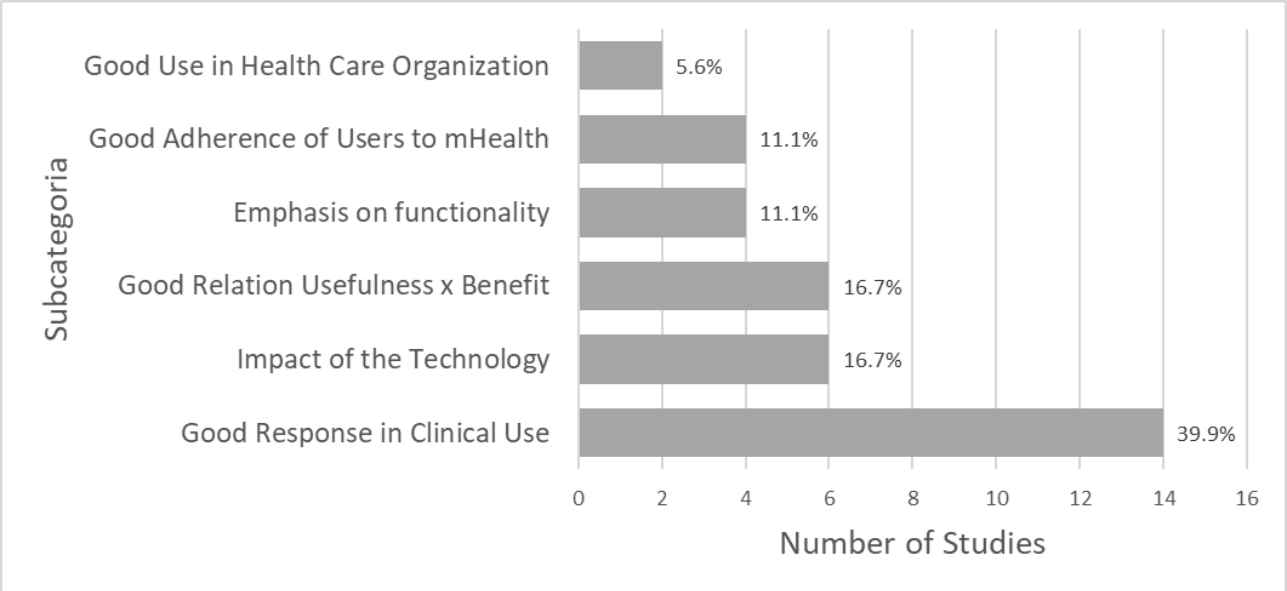
4.4. Target Audience

Analysis of the target audience of the studies reveals that the majority of studies (25 studies, 69.4%) focus on Women's Health Care in general, with no specific focus on pregnancy or the postpartum period, while a smaller portion (11 studies, 30.6%) focuses on the Care for Pregnant Women and Postpartum Women. This distribution suggests a lower representation of studies focused on the specific demands of the pregnancy-postpartum cycle.

4.5. Main Results

The main results were grouped into six subcategories (Figure 2):

Figure 2 - Distribution of the studies according to the main results obtained



Source: research data (2025).

- 1. Emphasis on Functionality: 4 studies (11.1%)
- 2. Good Adherence of Users to mHealth: 4 studies (11.1%)
- 3. Impact of Technology: 6 studies (16.7%)

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- 4. Good Relation Usefulness x Benefit: 6 studies (16.7%)
- 5. Good Use in Health Care Organization: 2 studies (5.6%)
- 6. Good Response in Clinical Use: 14 studies (38.8%)

5 CONSIDERATIONS

The predominance of Randomized Clinical Trials (RCTs) among the analyzed studies highlights an emphasis on evaluating the effectiveness of mobile applications under controlled conditions, reflecting the pursuit of greater methodological rigor to establish more coherent causal relations. This predominance suggests that mHealth research has been prioritizing the scientific validation of digital health interventions, aiming to assess their credibility and potential for clinical application.

At the same time, the considerable proportion of studies classified as pilot projects indicates the exploratory nature of these investigations, suggesting that many of the technologies analyzed are still in the development or preliminary validation phase. This scenario highlights the need for expanded, long-term, larger-scale studies to consolidate the effectiveness of these technological solutions in realistic contexts.

The predominance of the Training and Behavioral Change category, which relates to improving existing clinical conditions, highlights that mobile applications are being widely used to encourage tertiary prevention through the development of healthy habits, reinforcing their role as tools for education and the promotion of well-being and quality of life. This trend indicates an appreciation for the potential of digital technologies in modifying behaviors and adopting prophylactic practices, especially in the context of women's health.

However, despite the notable use of mHealth for women's health, the subfield of Pregnancy and Postpartum Care is underrepresented in the sample analyzed. Considering the relevance of the pregnancy-postpartum cycle for public health, this gap suggests the need for more studies and interventions targeting this population to ensure adequate technological support during pregnancy and postpartum.

Furthermore, the Good Response in Clinical Use category, which accounts for the majority of the studies analyzed (38.8%), reinforces the concern with evaluating the effectiveness of technological interventions in clinical settings. This finding suggests that the adoption of mobile applications in healthcare practice has been accompanied by an interest in improving clinical outcomes and their applicability in the daily routine of healthcare services.

Despite the observed advances, it is important to highlight that the results obtained in this study reveal that the selected articles predominantly address fragmented women's health care, without considering its connection to structured health systems. Furthermore, there is an emphasis on biopsychosocial support, with less attention to disease prevention strategies. This pattern reflects the influence of the biomedical model on the incorporation of health technologies, prioritizing the diagnosis and treatment of pathologies to the detriment of a more comprehensive approach, such as that advocated by the Family Health model[15].

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In this context, the use of mHealth may inadvertently reinforce traditional representations of women in healthcare, limiting their autonomy and protagonism in self-care. It is essential that the development and implementation of these technologies consider women as active participants in this process, promoting their effective participation in decision-making and strengthening their health management capacity.

To further this analysis, the study by Ryan et al.[16] can serve as a valuable reference, as it examines the implementation of mHealth in the context of the United Kingdom's National Health Service (NHS), a system that influenced the structuring of the SUS. Comparing these realities can contribute to identifying strategies for incorporating mobile technologies into the SUS, considering their specificities and challenges[17].

Among the limitations of this study is its dependence on the information presented in the selected articles, which may restrict the understanding of the context in which they are inserted. Moreover, the qualitative categorization of the evidence was conducted based on an inductive analysis, which, although systematic, is subject to a certain degree of subjectivity on the part of the researchers. It is also worth noting that the review was limited to the chosen databases, in the predetermined languages, and within the short time frame mentioned, which may result in the exclusion of potentially relevant articles not indexed in these repositories, in other languages, or published after the research period.

6 CONCLUSION

The findings of this article indicate that mobile application-mediated interventions represent a promising strategy for managing various health conditions, especially in the context of women's health. However, their effectiveness depends on multiple factors, including user adherence, integration with established clinical practices, and adaptation to the individual needs of the target population.

Although the literature highlights the benefits of using these technologies, challenges remain that must be overcome to ensure their widespread applicability. Variability in the acceptance and usability of applications, often influenced by users' profiles, highlights technological barriers and structural deficiencies that can compromise their implementation. These aspects highlight the need for thoughtful and adaptive approaches to developing digital health solutions, fostering their integration with existing health systems.

Given these challenges, it is essential to conduct studies that evaluate the effectiveness, acceptability, and quality of these interventions. In addition, further research is needed to assess the impact of these technologies on equity in access to health services and improvement in clinical outcomes, enabling more effective and sustainable implementation in the public health context.

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AUTHORS' BIOGRAPHY OR CURRICULUM

Jaqueline de Araújo Rezende Batistuta is a Family and Community Physician, holds a M.Sc. in Health Organizations Management from FMRP-USP, and is presently doing doctorate studies in Public Health at the same institution. She is a Professor at the School of Medicine of UNAERP since 2019 and participates in the Board of Evaluators of Anísio Teixeira National Institute for Educational Studies and Research (INEP) since Feb. 2025.

Márcia Mazzeo Grande is a Chemical Production Engineer, holds a M.Sc. in Production Engineering from UFSC and a Ph.D. in Engineering (Production Engineering) from USP. She is a Ph.D. Professor at USP; has experience in Production Engineering, working mainly in the fields of quality management, sustainability, practices in green logistics, retail and logistics.

Evandro Marcos Saidel Ribeiro is a Physicist, holds M.Sc. and Ph.D. in Physics from UFSCar, and post-doctoral studies from UNICAMP and USP-São Carlos. Qualification Thesis from FEARP-USP. He is associate Professor at FEARP-USP (Department of Administration) and associate researcher at the Center for Artificial Intelligence (C4AI) of IBM/USP/FAPESP and of CeMEAI. Field of activity: Data Science, Analytics.

Aldaísa Cassanho Forster is a Public Health Physician, with M.Sc. and Ph.D. in Preventive Medicine from FMRP-USP. Completed post-doctoral studies at Universidad Autónoma de Madrid, Spain. Qualification Thesis at USP. She is a senior collaborating Professor of the Department of Social Medicine at FMRP-USP. Her fields of interest are medical training, inter-professional training, family health, and health policies, planning and management.

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