

# Quality management in Human Milk Banks: a scope review

*Gestão da qualidade em Banco de Leite Humano: revisão de escopo*  
*Gestión de la calidad en los Bancos de Leche Humana: revisión de alcance*

**Rosana Rodrigues Figueira Fogliano<sup>1</sup>**

ORCID: 0000-0003-4129-4933

**Elena Bohomol<sup>1</sup>**

ORCID: 0000-0002-7196-0266

**Mariana Cabral Schweitzer<sup>1</sup>**

ORCID: 0000-0001-9833-2932

**Kelly Pereira Coca<sup>1</sup>**

ORCID: 0000-0002-3604-852X

**Ana Cristina Freitas de Vilhena Abrão<sup>1</sup>**

ORCID: 0000-0001-6249-2467

<sup>1</sup>Universidade Federal de São Paulo, São Paulo, São Paulo, Brazil.

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## Corresponding author:

Rosana Rodrigues Figueira Fogliano  
Email: [rosana.fogliano@unifesp.br](mailto:rosana.fogliano@unifesp.br)



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## ABSTRACT

**Objectives:** to identify the main quality management interventions used by professionals working at Human Milk Banks. **Methods:** a scope review conducted at PubMed, VHL, Scopus, SciELO, CAPES thesis and Google Scholar databases. Primary studies were included that address quality improvement strategies to improve Milk Bank processes in Portuguese, English and Spanish. **Results:** search totaled 192 scientific studies, 17 of which met the objective of the study and inclusion criteria. The main quality management interventions used in the Human Milk Bank addressed tools for continuous improvement. Six were aimed at improving processes, one to prevent errors and failures and two to achieve continuous monitoring. **Final Considerations:** the tools used by professionals working in Human Milk Banks have demonstrated effectiveness in managing the quality of services.

**Descriptors:** Milk Banks; Quality Management; Health Services Administration; Review; Nursing.

## RESUMO

**Objetivos:** identificar as principais intervenções de gestão da qualidade utilizadas pelos profissionais que atuam em Bancos de Leite Humano. **Métodos:** revisão de escopo realizada nas bases de dados PubMed, BVS, Scopus, SciELO, Banco de teses da CAPES e Google Acadêmico. Foram incluídos estudos primários que abordam as estratégias de melhoria da qualidade para aperfeiçoar os processos nos Bancos de Leite nos idiomas português, inglês e espanhol. **Resultados:** a busca totalizou 192 produções científicas, sendo que 17 atenderam ao objetivo do estudo e critérios de inclusão. As principais intervenções de gestão da qualidade utilizadas em Bancos de Leite Humano abordaram ferramentas de melhoria contínua, sendo seis voltadas para aperfeiçoar os processos, uma para prevenir erros e falhas e duas para alcançar o monitoramento contínuo. **Considerações Finais:** as ferramentas usadas pelos profissionais que atuam em Bancos de Leite Humano demonstraram efetividade na gestão da qualidade dos serviços.

**Descritores:** Bancos de Leite; Gestão da Qualidade; Administração de Serviços de Saúde; Revisão, Enfermagem.

## RESUMEN

**Objetivos:** identificar las principales intervenciones de gestión de la calidad utilizadas por los profesionales que trabajan en los Bancos de Leche Humana. **Métodos:** revisión del alcance realizada en las bases de datos de tesis PubMed, BVS, Scopus, SciELO, CAPES y Google Scholar. Se incluyeron estudios primarios que abordan estrategias de mejora de la calidad para mejorar los procesos del Banco de Leche en portugués, inglés y español. **Resultados:** la búsqueda totalizó 192 producciones científicas, de las cuales 17 cumplieron el objetivo del estudio y los criterios de inclusión. Las principales intervenciones de gestión de la calidad utilizadas en Bancos de Leche Humanas abordaron herramientas para la mejora continua, con seis destinadas a mejorar los procesos, una para evitar errores y fallas y dos para lograr un monitoreo continuo. **Consideraciones Finales:** las herramientas utilizadas por los profesionales que trabajan en los Bancos de Leche Humana han demostrado su eficacia en la gestión de la calidad de los servicios.

**Descritores:** Bancos de Leche; Gestión de la Calidad; Administración de los Servicios de Salud; Revisión; Enfermería.

## INTRODUCTION

Quality management is a model that enables standardization, security, rationalization and continuous improvement of services. It has proved to be a worldwide trend and a differential for organizations<sup>(1)</sup>. Quality management incorporation in health promotes a systemic approach and involves all managerial functions such as planning, organization, direction and control of the activities developed. These functions allow the manager to review the performance of processes, control costs, improve the meeting of customer needs, and develop employee knowledge<sup>(2)</sup>.

With regard to Human Milk Banks (HMB) in Brazil, quality management has been implemented as a guiding model to guarantee the supply of human milk (HM) with quality and safety in the microbiological, nutritional and operational efficiency of processes<sup>(3-5)</sup>. According to the Brazilian Human Milk Bank network, HMB are responsible for promoting, supporting and protecting breastfeeding, by providing assistance to mothers and offering HM to premature and hospitalized newborns<sup>(5-6)</sup>. Therefore, standardizing processes ensures the quality of the distributed HM, considered the best and safest option in the impossibility of breastfeeding directly on the breast, according to the World Health Organization (WHO)<sup>(7)</sup>, American Academy of Pediatrics<sup>(8)</sup>, and Ministry of Health of Brazil<sup>(5)</sup>.

Studies show the increasing use of expressed human milk (EBM) in the Neonatal Intensive Care Unit (NICU) and as a consequence, there is also the expansion of HMB in the world. There are currently approximately 500 HMB in more than 37 countries<sup>(4)</sup>. In Brazil, the number of HMB exceeds 200, which requires standardization of practices and monitoring of the performance of process results to ensure the quality of processed and distributed milk<sup>(9)</sup>. The HMB system in general, consists of processing, HM quality control and assistance processes<sup>(5-6)</sup>. Considering the specificity of HM, nursing literature is more diverse in the control of physical-chemical, nutritional and microbiological quality. However, there is a lack of knowledge regarding the improvement intervention strategies applied in the activities developed in the HMB in the general scope of the process, from milk capture to its distribution.

In this sense, there is a need to explore the quality management practices implemented. It is essential that quality is based on actions and that allows professionals to monitor the performance of operational procedures, assess the results and continuously review the methods adopted. Expressed milk is destined to serve a vulnerable population that is hospitalized in the NICU of hospitals.

## OBJECTIVES

To identify the main quality management interventions used by professionals working at HMB.

## METHODS

This is a scope review that aims to map scientific studies in a broader and more comprehensive way, to provide more explicit details on each stage of its development, increasing the clarity and rigor of the review and identifying gaps in the knowledge base of the researches<sup>(10)</sup>. The review was developed following the 5

steps: (1) identification of the research question; (2) identification of relevant studies; (3) selection of studies; (4) data extraction; (5) grouping, writing, and synthesis of results<sup>(10)</sup>.

The research question was elaborated from PCC strategy, acronym of P (Population) related to health professionals who work in HMB; C (Concept) quality management; and C (Context) related to HMB<sup>(10-11)</sup>. Therefore, it was elaborated with the following question: how do health professionals carry out quality management in HMB?

To identify the relevant studies, searches were conducted at the National Library of Medicine (PubMed), Virtual Health Library (BVS), Scopus; two digital libraries Scientific Eletronic Library Online (SciELO), dissertation and thesis databases of the Coordination for the Improvement of Higher Education Personnel (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*, abbreviated CAPES) of the Ministry of Education of Brazil.

Search was carried out from February to June 2019 using the Health Sciences Descriptors (DeCS) at the BVS, CAPES and SciELO in Portuguese: "*Profissional da Saúde*", "*Banco de Leite Humano*", "*Gestão da Qualidade*", "*Indicadores de Qualidade em Assistência à Saúde*", "*Qualidade da Assistência à Saúde*", "*Administração de Serviços de Saúde*", "*Controle de Qualidade*". For PubMed and Scopus, Medical Subject Headings (Mesh) terms were used: "Health Personnel", "Milk Banks", "Quality Management", "Quality Indicator Health Care", "Quality of Health Care", "Health Services Administration", "Quality Control". The descriptors "*Banco de Leite Humano*" and "Human Milk Banks" were combined in each database using the Boolean operators AND with all other descriptors and in pairs. To expand the search strategy, Google Scholar was included using combinations of the following terms: "Indicators", "Quality Management", "Quality Improvement", "Quality Control" and "Human Milk Banks". EndNote<sup>®</sup> was used to manage references, import articles from databases, and organize them into groups.

For the selection of studies, the inclusion criteria were quantitative or qualitative primary studies and review studies, published in Portuguese, Spanish, and English, without time restrictions. All studies that addressed the quality improvement strategies applied to improve the processes in HMB were included, according to established criteria. The publications were selected and analyzed, from reading titles, abstracts, and full material, by two independent reviewers and the differences were discussed among the researchers. All included studies followed the ethical precepts required.

Data extraction was performed using a form to obtain the following findings: characterization of studies (title, year and country of origin); objective, main results and quality management interventions used by professionals working at HMB. The study selection steps were performed according to the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA)<sup>(12)</sup>.

To classify the strategies found, we used the theoretical framework that guides the principles of total quality management defined by Kaoru Ishikawa<sup>(13)</sup>. Kaoru Ishikawa's management proposal for total quality control represented transformation of the Japanese quality model, and emphasized the monitoring of processes through quality control circle. To that end, he uses a set of tools with specific applications for analysis and problem

solving that happens, with participation of people involved in the service<sup>(13)</sup>.

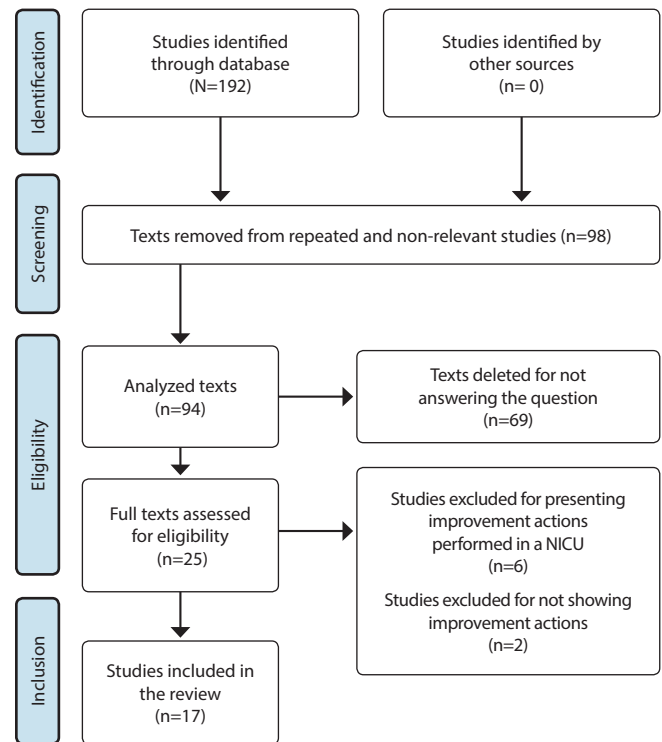
## RESULTS

The searches resulted in a total of 192 scientific studies distributed in the databases. Figure 1 shows the stages and the results obtained, which consisted of 15 articles and two dissertations totaling 17 studies.

Chart 1 shows the authors, titles, country, journals and year of publication. When the origin of the studies was analyzed, nine (52.9%) were carried out in Brazil, three (17.6%) in the United States of America; two (11.7%) in Italy; and a publication referring to Australia, South Africa and Poland, respectively. The identified studies were published between 2003 and 2019, with greater interest in the theme in 2014 and 2015 with seven studies, equivalent to 41.2%.

Chart 2 presents the authors, objective of the study, improvement interventions used by professionals working at HMB and the outcomes achieved.

The results demonstrated the use of nine quality tools as interventions to support and improve HMB quality management activities. These activities addressed tools to improvement of processes in 64.7% (n=11) of the studies, 11.7% (n=2) to prevent errors and failures and 35.2% (n=6) to achieve continuous monitoring results. Chart 3 presents an overview of the tools, the processes involved and classification of the studies.



**Figure 1** – Flow diagram of the selection of review articles according to PRISMA, São Paulo, São Paulo, Brazil, 2019

**Chart 1** - Articles selected in the scope review according to authorship, title, country of study, journal and year of publication, São Paulo, São Paulo, Brazil, 2019

| Authors  | Title   | Country       | Journal   | Year |
|--|---|---------------|---|------|
| Wesolowska A, Sinkiewicz-Darol E, Barbarska O, Bernatowicz-Lojko U, Borszewska-Kornacka MK, van Goudoever JB <sup>(14)</sup> | Innovative Techniques of Processing Human Milk to Preserve Key Components   | Poland        | Nutrients   | 2019 |
| Hartmann BT <sup>(15)</sup>  | Ensuring Safety in Donor Human Milk Banking in Neonatal Intensive Care  | Australia     | Clinics in Perinatology                           | 2017 |
| Peila C, Emmerik NE, Giribaldi M, et al. <sup>(16)</sup>   | Human Milk Processing: A Systematic Review of Innovative Techniques to Ensure the Safety and Quality of Donor Milk  | Italy         | Journal of Pediatric Gastroenterology & Nutrition | 2017 |
| Grazziotin et al. <sup>(17)</sup>  | Analysis of the Storage Methods for Raw Human Milk from Mothers with Infants Admitted to a Neonatal Intensive Care Unit, According to Brazilian Regulations | Brazil        | Journal of Human Lactation                        | 2016 |
| Naicker M, Coutsooudis A, Israel-Ballard K, Chaudhri R, Perin N, Mlisana K. <sup>(18)</sup>                                  | Demonstrating the efficacy of the FoneAstra pasteurization monitor for human milk pasteurization in resourcelimited settings                                | South Africa  | Breastfeeding Medicine                            | 2015 |
| De Nisi G, Moro GE, Arslanoglu S, Ambruzzi AM, Biasini A, Profeti C, et al. <sup>(19)</sup>                                  | Survey of Italian human milk banks  | Italy         | Journal of Human Lactation                        | 2015 |
| ME Maes, MT Possamai, MG Assoler, FAH Sardá <sup>(20)</sup>  | <i>Sistema HACCP em banco de leite humano</i>   | Brazil        | <i>Higiene Alimentar</i>                          | 2015 |
| Menezes G, de Lima-Cavalcanti L, de Morais-Oliveira AM, Costa-Pinto Rde M, Steffen-Abdallah VO <sup>(21)</sup>               | Evaluation of home collection performed by a human milk bank in a university hospital in Brazil   | Brazil        | <i>Salud Publica de Mexico</i>                    | 2014 |
| Brownell EA, Lussier MM, Herson VC, Hagadorn JI, Marinelli KA <sup>(22)</sup>  | Donor human milk bank data collection in north America: an assessment of current status and future needs  | United States | Journal of Human Lactation                        | 2014 |

To be continued

Chart 1 (concluded)

| Authors  | Title   | Country       | Journal   | Year |
|--|---|---------------|---|------|
| Spatz, D. L., Schmidt, K. J. & Kinzler, S <sup>(23)</sup>                | Implementation of a human milk management center  | United States | Advances in Neonatal Care   | 2014 |
| Carroll, K <sup>(24)</sup>   | Body dirt or liquid gold? How the 'safety' of donated breastmilk is constructed for use in neonatal intensive care  | United States | Social Studies of Science   | 2014 |
| Vieczorek, A., Wolff, L. <sup>(25)</sup>                                 | Evaluation of Human Milk Banks in Paraná - Br: a comparative study  | Brazil        | Online Brazilian Journal of Nursing                               | 2012 |
| Torrezan AC <sup>(26)</sup>  | <i>Gestão do processo assistencial e processos de Banco de leite</i>  | Brazil        | Online Master's Dissertation                                      | 2011 |
| Grazziotin AL, Graziotin MCB, Letti LAJ <sup>(27)</sup>                  | Disposal of human milk donated to a human milk bank before and after measures to reduce the amount of milk unsuitable for consumption                                   | Brazil        | <i>Jornal de pediatria</i>  | 2010 |
| Silva JHF <sup>(28)</sup>  | <i>Inovações tecnológicas para uma estratégia de qualificação dos produtos e dos processos de trabalho em Bancos de Leite Humano: o sistema de gerenciamento BLMWEB</i> | Brazil        | Master's Dissertation   | 2009 |
| Silva ER, Abdallah VOS, Oliveira AMM <sup>(29)</sup>                     | <i>Qualidade microbiológica do leite humano ordenhado no domicílio: eficácia de uma educational action</i>  | Brazil        | 5 <sup>th</sup> Academic Week. Universidade Federal de Uberlândia | 2008 |
| Costa ACM, Pereira DCA, Silva JAR, Neto JPS, Britto MHSS <sup>(30)</sup> | <i>Avaliação da qualidade dos bancos de leite humano no município de São Luís- MA, no período de abril a junho de 2003</i>  | Brazil        | UFMA University Hospital Journal                                  | 2003 |

Chart 2 - Distribution of selected articles according to authors, year of publication, objectives, improvement interventions and outcome achieved, São Paulo, São Paulo, Brazil, 2019

| Authors                                 | Objectives  | Improvement interventions | Outcomes   |
|---|---|---------------------------|--|
| Wesolowska et al., 2019 <sup>(14)</sup> | To compare HM pasteurization methods to improve the safety and quality of donated milk.   | Critical analysis         | HPP and ultraviolet-C irradiation methods seem to minimize losses as a result of HM processing.  |
| Hartmann, 2017 <sup>(15)</sup>          | To assess the risks and benefits for HMB donors and recipients using a systematic method.   | Risk management - HACCP   | Potential hazards and benefits are identified at each stage of HMB processes, and the minimum acceptable standard for safe practice is defined.                        |
| Peila et al., 2017 <sup>(16)</sup>      | To assess the evidence on the effectiveness of new pasteurization techniques on the quality and safety of HM  | Critical analysis         | The HTST method showed equivalence to the standard pasteurization method, guaranteeing the microbiological safety of HM.   |
| Grazziotin et al., 2016 <sup>(17)</sup> | To assess the evidence on the raw HM storage protocol according to Brazilian regulations.   | Critical analysis         | The methods of storage in refrigeration (5°C/12 hours) and freezing (20°C/15 days) were validated and the energy content of milk was preserved.                        |
| Naicker et al., 2015 <sup>(18)</sup>    | To assess the safety and effectiveness of a mobile pasteurization monitor, FoneAstra, based on Smartphone, as a quality control system for the pasteurization process.          | Information technology    | None of the samples pasteurized using FoneAstra showed bacterial growth. The innovative tool proved to be safe, effective and low cost for HM pasteurization.          |
| De Nisi et al., 2015 <sup>(19)</sup>    | To compare the operating procedures of 28 Italian HMB to identify areas of strength and improvement.  | Benchmarking              | Divergence in the structure (number of hours worked, number of rooms and number of equipment), in the selection processes and mandatory microbiological control.       |
| ME Maes et al., 2015 <sup>(20)</sup>    | To manage risk and control food safety hazards at HMB.  | Risk management - HACCP   | The critical points were identified: 6 prevented (CCPp), 4 eliminated (CCPe) and 1 reduced (CCPr), which made corrective actions possible.                             |
| Menezes et al., 2014 <sup>(21)</sup>    | To assess home collection and transport of raw HM during home visits.   | Checklist                 | Weaknesses in the collection process were identified, such as hair protection (93.8%), hand hygiene (83.3%), nail care (87.5%) and neglecting the first drops (33.3%). |
| Brownell et al., 2014 <sup>(22)</sup>   | To monitor data from HMBANA belonging to HMBANA, on the characteristics of the donor and donated milk, the feasibility and the interest in participating in a central registry. | Information technology    | There was no uniformity in the data collected. A lack of standardization and transparency of information was identified.   |

To be continued

Chart 2 (concluded)

| Authors                                 | Objectives   | Improvement interventions            | Outcomes   |
|---|--|--------------------------------------|--|
| Spatz et al., 2014 <sup>(23)</sup>      | To analyze the key activities in the implementation of an HM management center in a children's hospital.                             | Flow mapping                         | Structural weaknesses, the need to improve processes, change in local culture, training of teams and periodic assessment of results were identified.                               |
| Carroll, 2014 <sup>(24)</sup>           | To draw the flow of the donated HM of two HMB, from selection to distribution and assess the process safety.                         | Flow mapping                         | The variety of practices and security process in the selection and education of donors, pasteurization and microbiological analysis of the HM between the two HMB were identified. |
| Vieczorek & Wolff, 2012 <sup>(25)</sup> | To compare the structure and processes of 8 HMB <i>paranaense</i> based on RDC 171/2006 and ANVISA's HMB operating manual.           | Benchmarking                         | The weak and strong points in the eight HMB were identified. The percentage of compliance ranged from 72 to 85% and non-compliance showed an average of 21%.                       |
| Torrezan, 2011 <sup>(26)</sup>          | To implement the Process Management methodology in HM assistance and processing activities.  | Flow mapping<br>PDCA<br>Benchmarking | All stages were known and an action plan to improve and monitor all processes was implemented.   |
| Grazziotin et al., 2010 <sup>(27)</sup> | To assess the causes of disposal of the donated HM and the impact of the implemented measures.                                       | Checklist                            | The causes of disposal were identified and showed a positive impact in reducing the volume of discarded donated milk.  |
| Silva, 2009 <sup>(28)</sup>             | To know the technological innovations produced by the HMBWEB system in the qualification of HMB performance.                         | Information system                   | Construction of indicators that qualify HMB management, processes and procedures.  |
| Silva et al., 2008 <sup>(29)</sup>      | To compare the physical-chemical and microbiological quality of raw HM at home and at HMB before and after a new educational action. | Educational action                   | There was no improvement in relation to Dornic acidity and microbiological analysis after educational actions.   |
| Costa et al., 2003 <sup>(30)</sup>      | To compare the structure, processes and results of two HMB in the city of São Luís, state of Maranhão.                               | Benchmarking                         | Divergences were identified regarding the physical, organizational and process control structures that compromise the quality of the product.                                      |

Note: ANVISA - Brazilian National Health Surveillance Agency; HACCP - Hazard Analysis and Critical Control Points; HMB - Human Milk Bank; HMBWEB - Human Milk Bank Management and Production System; HMBANA - Human Milk Banking Association of North America; HoP - Holder Pasteurization; HTST - High-Temperature Short-Time; HPP - High Pressure Processing; HM - Human Milk; CCP - Critical Control Point; PDCA - Plan, Do, Check, Action; DRC - ANVISA's Board Resolution; NICU - Neonatal Intensive Care Unit.

**Chart 3** - Human Milk Bank process, studies according to the principles of total quality management, classification of tools and improvements achieved, São Paulo, São Paulo, Brazil, 2019

| Tools/ Interventions                         | HMB process                     | Improvements achieved            |
|--|---------------------------------|----------------------------------|
| Checklist <sup>(21,27)</sup>                 | Raw HM collection and transport | Improvement of processes         |
|  | Raw HM selection                | Improvement of processes         |
| Educational action <sup>(29)</sup>           | HM collection                   | Improvement of processes         |
| Critical analysis <sup>(14,16-17)</sup>      | Raw HM storage                  | Improvement of processes         |
|  | Pasteurization                  | Improvement of processes         |
| Information technology <sup>(18,22,28)</sup> | Pasteurization                  | Continuous monitoring of results |
|  | All processes                   | Continuous monitoring of results |
| Flow mapping <sup>(23-24,26)</sup>           | All processes                   | Continuous monitoring of results |
| HACCP <sup>(15,20)</sup>                     |                                 | Prevent errors and failures      |

Note: HM - Human Milk; PDCA - Plan, Do, Check, Action; HACCP - Hazard Analysis and Critical Control Points; HMB - Human Milk Banks.

## DISCUSSION

This review allowed us to know the quality management interventions used by professionals working at HMB. Improvement tools

were identified aimed at improving processes, risk management, and monitoring results to strengthen the HMB system. Research on implementing quality tools in HMB are little explored.

### Tools to improvement of processes

Among the tools found for the improvement of processes, it is worth highlighting checklist, educational action, critical analysis, new technologies, flow mapping, PDCA cycle. The tools are used to achieve process improvement in HMB services and contributed to continuously assessing, improving, and monitoring process variability against the standard. Such tools are widely used because they allow the maintenance of good results; improvement of quality standards and process control<sup>(13)</sup>.

Checklist was used in two studies<sup>(21,27)</sup> to improve the processes of collection, transport and selection of raw HM, and proved to be efficient as a verification script. It allows aligning and standardizing the activities performed by HMB, besides functioning as a reminder for the application of the best evidence<sup>(31)</sup>. Its application has been increasingly common in the health area, and has demonstrated potential to be used as a standardization and communication tool in the Intensive Care Unit, to increase safety and avoid errors<sup>(32)</sup>.

Regarding the educational action applied with donors in the home collection process<sup>(29)</sup> did not generate evidence of improvement in the identified study, when the parameters of Dornic acidity and microbiological analysis were analyzed. Although intuitive and very common, educational action has had an under-optimal result due to the non-retention of critical

information by the patient<sup>(33)</sup>. In order to improve this setting, educational action should not be isolated, but associated with other resources that potentiate its action<sup>(34-35)</sup>.

As for critical analysis, used in three studies<sup>(14,16-17)</sup>, it showed the importance of knowing the established scientific evidence and following the quality standards proposed to standardize the management, organization and control of HMB procedures. Critical analysis allowed us to conclude that there are divergences between countries in relation to these protocols and there is a need to implement universal quality principles for all HMB and neonatal units<sup>(36)</sup>.

Developing innovative and low-cost Information Technologies has also been studied<sup>(18)</sup> as improvement actions during the pasteurization process and is a reality that should be considered. One of the strategies used by Brazilian HMB was to operate with alternative technologies for the physical, chemical and microbiological quality control of HM, aligning low operating costs and technical rigor, ensuring the quality of the distributed product<sup>(6)</sup>.

The flow mapping used in three studies<sup>(23-24,26)</sup> and the PDCA cycle implemented in another study<sup>(26)</sup> also allowed a broader managerial view of all processes involving HM, because it made it possible to detail the sequence of activities, identify deviations or failures that need to be corrected to improve the final performance and security of HMB services. Nursing literature demonstrates the value of PDCA cycle as the most useful tool in implementing of quality programs in health<sup>(37)</sup>. This method is an initial component of the quality process approach; its application requires compliance with all steps, otherwise the varied practice will compromise its effectiveness as a method of improvement<sup>(37)</sup>. The use of these tools for changes in practices proved to be a successful strategy to increase the rates of breast milk use in premature newborns<sup>(38-39)</sup>.

Despite the different purposes mentioned in the studies, all publications converge to the need to seek improvements in the performance of critical areas and demonstrates a challenging and dynamic behavior in relation to management practices that mark the HMB setting. Tool deployments range from the simplest, such as checklist, to the most comprehensive ones, like critical analysis, and present themselves as an opportunity for improvement in the quality domain.

### Tools for risk management

Only the Hazard Analysis and Critical Control Point (HACCP) has been identified for risk management. This process safety strategy is one of the most important axes to offer safe and high-quality HM. This is a prospective assessment carried out in a systemic and continuous way to identify situations that may affect the safety of organizational processes and procedures<sup>(40)</sup>. With increased emphasis on all types of avoidable errors, risk management has been an increasingly common concern addressed by HMB, for identifying failures and hazards during the processing and administration of LH<sup>(40)</sup>.

HACCP was implemented and two studies<sup>(15,20)</sup>, and it is as a food safety management system that enables the analysis and control of physical hazards, chemical and/or biological products at each step of production<sup>(41)</sup>. In countries that do not have specific legislation to support and control the use of HM, risk

management has been implemented as a quality management system to develop the standards of operational procedures<sup>(42)</sup>.

### Tools for monitoring results

For management of the results, two tools, benchmarking and analysis of quality indicators, were found.

Benchmarking was used in four studies<sup>(19,25-26,30)</sup> as a management tool, to systematically compare the work processes between the HMB, aiming to achieve better results<sup>(43)</sup>. This demonstrates the importance of the role of HMB managers in performing periodic assessment actions to boost processes. This tool has been shown to be efficient when there is a need to analyze established metrics to improve practices and modify processes to provide more reliable decision making<sup>(43)</sup>. In contrast, a review on the effectiveness of benchmarking to improve quality in specialized hospitals has shown promising effects, however more robust and structured actions are needed for the use of the tool<sup>(44)</sup>.

Monitoring of indicators in information systems was a tool used in HMB services, in two studies<sup>(22,28)</sup> made it possible to make strategic comparisons, knowledge about critical points in the processes, assisting the manager in deepening the results to create, share knowledge and evidence of the activities. A study conducted with hospital managers<sup>(45)</sup> demonstrated that information sharing is essential for the application of the indicator system, besides favoring the development of knowledge. The availability of reliable and quality information supports managers to provide better results.

### Study limitations

Among the limitations of this review, it is possible that some studies were lost due to lack of a taxonomy of managerial terms. Moreover, the inclusion of studies published only in English, Portuguese and Spanish may have limited the identification of more studies.

### Contributions to the area

Identifying the quality management interventions used by professionals working at HMB made it possible to know the most used tools in the area. The scarcity of studies demonstrates a need to deepen the discussion, as it represents a promising strategy for improving the quality of the service. Its implementation and frequent use is still a challenge for most HMB managers. We highlight the need to prepare these professionals for the choice of tools that better meet the strategic objectives of each service.

The challenges for future research are to develop knowledge about improvement tools with their proven effectiveness, in addition to the experience and knowledge of managers and professionals who are at the forefront of services on the relevance of continuous quality improvement.

### CONCLUSIONS

Quality management studies in HMB are still scarce. The quality improvement tools identified were related to process

improvement, risk analysis and results monitoring. Six tools were effective for process management, showing the concern of HMB managers in structuring the sequence of their activities, solving problems efficiently and, mainly, promoting and ensuring the quality of service. The specific tool for risk management showed the prospective action focused on the safety of processes and patients. However, without a culture and responsibility of

managers regarding risks, actions become superficial. Finally, two tools assisted in the management of results, demonstrating the importance of using quality indicators for the establishment of standards and comparison over time. Measuring the quality of services has become a priority in health and are important tools to support management decisions, but it is an exercise that must be developed.

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