

REVIEW ARTICLE

Care related to vaccines from the evolutionary perspective of Rodgers

Cuidado com vacinas na perspectiva evolucionária de Rodgers

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ABSTRACT

The study aims to analyze the concept care related to vaccines from the evolutionary perspective of Rodgers. It refers to an analysis of the concept care related to vaccines, carried out in the National Library of Medicine databases, Cumulative Index to Nursing and Allied Health Literature, Latin-American and Caribbean on Health Sciences and Web of Science, with final sample of 17 articles, through critical and reflective reading. The attributes were represented by the properties and benefits of vaccines. The antecedents refer to heat/freeze/light effects, unnecessary losses of vaccines, compromised vaccines reliability. The resultants: need for the professionals' training, safety in the vaccines stock and quality of immunization were some elements presents. The terms related and the implications and hypotheses were also determined. The concept of the phenomenon provides grants for the promotion of safe and effective practices with vaccines and contributes to the construction of knowledge in the nursing area.

Descriptors: Concept Formation; Nursing; Vaccines; Nursing Care.

RESUMO

O estudo objetiva analisar o conceito cuidado com vacinas na perspectiva evolucionária de Rodgers. Refere-se a uma análise do conceito cuidado com vacinas, realizada nas bases de dados National Library of Medicine, Cumulative Index to Nursing and Allied Health Literature, Literatura Latino-Americana e do Caribe em Ciências da Saúde e Web of Science, com amostra final de 17 artigos, através de leitura crítico-reflexiva. Os atributos foram representados pelas propriedades e benefícios das vacinas. Os antecedentes referem-se aos efeitos do calor/congelamento/luz, perdas desnecessárias de vacinas, confiabilidade das vacinas comprometida. Os consequentes: necessidade de capacitação dos profissionais, segurança no estoque de vacinas e qualidade da imunização foram alguns elementos presentes. Os termos relacionados e as implicações e hipóteses também foram determinados. O conceito do fenômeno proporciona subsídios para a promoção de práticas seguras e efetivas com vacinas e contribui para a construção de conhecimentos na enfermagem.

Descritores: Formação de Conceito; Enfermagem; Vacinas; Cuidados de Enfermagem.

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INTRODUCTION

Universally recognized subjective action, the care is present in every culture. However, the diversity of definitions related to this term is a reflection of socio-cultural practices and particular values existing in each social group and not only of the realization of techniques and procedures or as a trade of a profession⁽¹⁾.

In the health area, the care is considered as the essence of the nursing profession. This act is understood as a fundamental element for the society and, for its full performance, it requires production of knowledge and special competencies that support the actuation of the subjects who realize it⁽²⁾.

The care action is used by the nurse to reach a goal, made effective from technical skills and theoretical knowledge. Among their different attributions in the daily of services, this worker is responsible for organizing, coordinating, planning and evaluating the activities with vaccines^(2,3).

The vaccines, also called immunobiologicals, are preparations that contains microorganisms living, dead, or their fractions, with antigenic properties. The procedure of administering vaccines, through the introduction into the organism of antigens or attenuated living, which lead to immunization, is called vaccination⁽⁴⁾.

The immunization is characterized as the process that leads to the immunity. This process, in turn, corresponds to the resistance state associated to the presence of antibodies with a peculiar action on causing infectious diseases or about their toxins. So that the immunization happens in a full and safety way, it must be followed by care, with appropriate actions before, during and after the immunobiologicals' administration⁽⁴⁾.

Due to being thermolabile and photosensitive, the vaccines are easily affected by the temperature and luminosity alterations, respectively. When exposed to the conditions that cause deviation in their quality, such as the inappropriate storage, they may have their potency/efficacy and immunizing properties compromised^(4,5).

Other factors may contribute to situations that affect the care with vaccines, such as the non-adhesion of the nursing workers to the practice of the temperature control, affecting the immunobiologicals' reliability, in the waste of resources and prejudices in the vaccination coverage. In front of these problems, strategies were conceptualized in the perspective of reducing failures with these products. As one of the measures, it is mentioned the National Immunization Program (NIP), considered world reference and with the aim at endorsing the correct handling of these supplies^(6,7).

In the middle of this context and due to the different meanings of care that make it possible the professional practices, one could visualize the need to do more to disclose the interfaces of the expression care with vaccines, which

requires clarification and refinement, since the inappropriate use of some terms may affect this practice.

Therefore, it is understood that it is important conceptualizing it adequately in order to be able to contribute with the care quality. To that end, it is necessary to deepen the understanding on the subject, from the analysis of the national and international publications about this concept, which will allow to contribute with future researches in this area and cooperate with the practices that involve the immunization.

Thus, this study will be guided by the following questioning: How the concept care with vaccines is used in the researches produced in the health area? Therefore, in order to answer this question, the aim is to analyze the concept care with vaccines from the evolutionary perspective of Rodgers⁽⁸⁾.

METHOD

Study developed from the evolutionary method of Rodgers, which represents an inductive, descriptive and non-sequential model, applied for ascertaining the concordance and the knowledge of a specific term over time. It understands the concept in a dynamic way, through a cyclical process, in which the studied phenomenon suffer modifications over the years from a direct relationship with the situation in which is used⁽⁸⁾. This method includes six stages (Figure 1).

In this research, the definition of the concept of interest was care with vaccines, from the indexed productions about the theme and its associated expressions, with regard to the stage 1. The second, the field selection for the data collect, occurred in December 2018, in the databases National Library of Medicine (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Latin American and Caribbean Health Sciences (LILACS) and Web of Science, by having materials of scientific quality and of visibility for the nursing area.

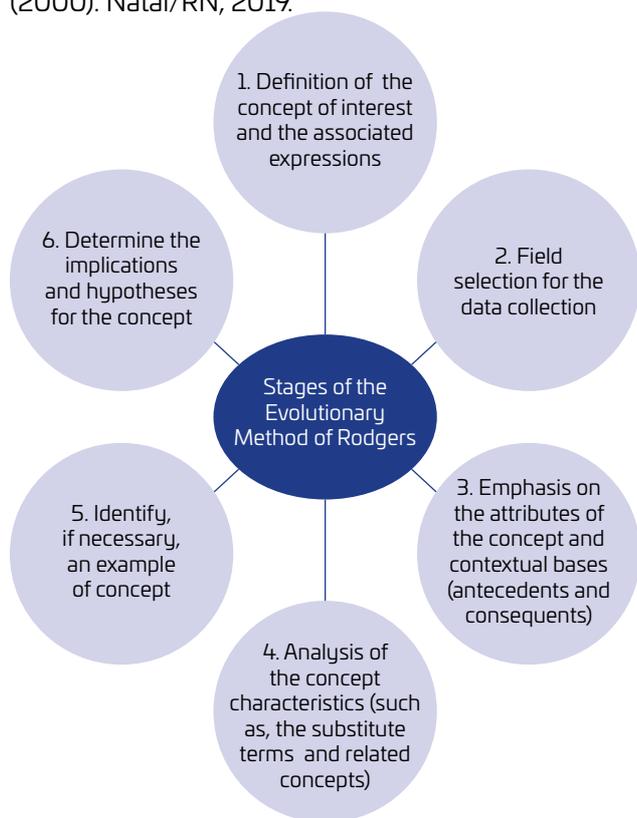
To guide all the work, a protocol elaborated by the researchers was used, with indicators of collect, aiming at systematizing the process. In the characterization of the researches we included: title, year of publication, place of study, type of study. In the analysis the selected indicators are organized according to the evolutionary method of Rodgers⁽⁸⁾: attributes/concept, conceptual base — antecedents and consequents, substitute terms, related terms, and implications and hypotheses.

The selection of the articles occurred by consultation with the Health Sciences Descriptors (DeCS) and the Medical Subject Headings (MeSH), with selection of the terms Primary Health Care; Health Professionals and Care with Vaccines for the DeCS, and Primary Health Care (#1), Health Personnel (#2), Care (#3) and Vaccines (#3) for the MeSH. In all the databases inserted into the research there were adopted in the crossings: #1 AND #3, #2 AND #3 and #1 AND #2 AND

#3. The time limit of the publications was not used, since it was intended to develop a conceptual analysis.

For the third stage, which refers to the relevant data collect, with emphasis on the concept attributes and conceptual bases, through the antecedents and consequents, the inclusion criteria established contemplated: scientific articles in Portuguese, Spanish and English that addressed the theme, available in full electronically. Documents repeated

Figure 1. Cyclical development of the concept: the six stages of the evolutionary method of Rodgers (2000). Natal/RN, 2019.



Source: adaptation of Rodgers (2000)⁽⁸⁾.

were analyzed only in one base. The other duplicated materials and that were not in accordance with the research were excluded.

The analysis of the concept characteristics began with the reading of the titles of the pre-selected works in the stage 2, from the eligibility criteria. This process was necessary to select the materials of interest for the research and extract the elements from the model adopted, by objective reading.

Next, the fragments that arose with more frequency regarding the attributes, antecedents and consequents of the analyzed concept were identified and separated in the texts. The topics of these materials located in the literature researched were typed and, from an inductive procedure, we listed the possible attributes, antecedents and consequents.

These data were stored and entered in a worksheet of the Microsoft Excel 2010[®] Program, through a double gathering, to organize and make the subsequent appreciation easy. According to the Rodgers⁽⁸⁾ method, its fifth stage identifies an example of concept, if necessary. Therefore, in this study, this stage has not be included due to be an optional item. For the sixth stage the implications and hypotheses were determined with a view to contributing with prevailing aspects for the succession of the concept over time.

RESULTS

There were found 9,682 articles. After the reading of the titles and abstracts and attending to the eligibility criteria, 9,642 were excluded, with pre-selection of 40. After refinement, the final sample included 17⁽⁹⁻²⁵⁾ publications (Figure 2).

All articles were read in full, in a careful way, and distributed according to authors, title and periodical, as shown in the Chart 1. Of the selected, there was predominance of the Portuguese language, with 10 documents, six in the English language and one in Spanish.

With regard to the year, the materials dated back to 1995 a 2017, and seven articles used the type of cross-sectional

Figure 2. Flowchart of selection of included articles. Natal/RN, 2019.

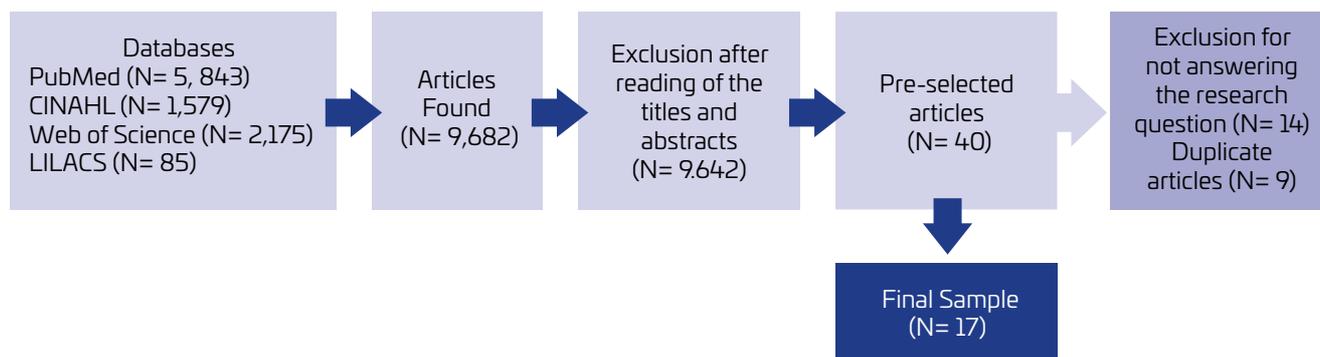


Chart 1. Presentation of the articles included in the concept analysis according to authors, title and periodical.

Authors	Title	Periodical
Barber-Hues C, Rodriguez-Sánchez O, Cervera-Pérez I, Peiró S	The vaccine cold chain in a Valencian health department ⁽⁹⁾	Gaceta Sanitaria
Oliveira VC, Gallardo MDPS, Cavalcante RB, Arcêncio RA, Pinto IC	Weaknesses of vaccine storage in Primary Health Care Centers ⁽¹⁰⁾ .	Revista Brasileira de Enfermagem
Oliveira VC, Guimarães EAA, Guimarães IA, Januário LH, Pinto IC	Nursing practice in vaccines preservation ⁽¹¹⁾ .	Acta Paulista de Enfermagem
Oliveira VC, Gallardo MDPS, Arcêncio RA, Gontijo TL, Pinto IC	Assessment of quality of vaccine storage and conservation in Primary Health Care Centers ⁽¹²⁾ .	Ciência e Saúde Coletiva
Mallik S, Mandal PK, Chatterjee C, Ghosh P, Manna N, Chakrabarty D, et al.	Assessing cold chain status in a metro city of India: an intervention study ⁽¹³⁾ .	African Health Sciences
Ferreira AV, Freitas PHB, Viegas SMF, Oliveira VC	Access to the vaccination room of the Family Health Strategy: organizational aspects ⁽¹⁴⁾ .	Revista de Enfermagem UFPE On Linie
Thielmann A, Viehmann A, Weltermann BM	Effectiveness of a web-based education program to improve vaccine storage conditions in primary care (Keep Cool) study protocol for a randomized controlled trial ⁽¹⁵⁾ .	Trials
Ferreira AV, Oliveira CF, Guimarães EAA, Cavalcante RB, Moraes JT, Oliveira VC	Access to vaccination room in primary health care services ⁽¹⁶⁾ .	Revista Eletrônica de Enfermagem
Siqueira LG, Martins AMEBL, Versiani CMC, Almeida LAV, Oliveira CS, Nascimento JE, et al.	Assessment of the organization and operation of vaccination rooms in primary health care in Montes Claros, Minas Gerais, Brazil, 2015 ⁽¹⁷⁾ .	Epidemiologia e Serviços de Saúde
Raglione D, Bezerra GAM, Lopes MH, Nerger MLBR, Guimarães TC, Sartori AMC	Evaluation of the cold chain for vaccine conservation in primary health care centers in the South and Midwest regions of São Paulo in 2011-2012 ⁽¹⁸⁾ .	Epidemiologia e Serviços de Saúde
Vasconcelos KCE, Rocha AS, Ayres JA	Evaluation of vaccination rooms in the primary health care network of the municipality of Marília, State of São Paulo, Brazil, 2008-2009 ⁽¹⁹⁾ .	Epidemiologia e Serviços de Saúde
Ogboghodo EO, Omuemu VO, Odijie O, Odaman OJ	Cold chain management practices of health care workers in primary health care facilities in Southern Nigeria ⁽²⁰⁾ .	The Pan African Medical Journal
Oliveira VC, Rennó HMS, Santos YR, Rabelo AFG, Gallardo MPS, Pinto IC	Education for work in vaccination room: perception of nursing professionals ⁽²¹⁾ .	Revista de Enfermagem do Centro Oeste Mineiro
Mugharbel KM, Wakeel SMA	Evaluation of the availability of cold chain tools and an assessment of health workers practice in Dammam ⁽²²⁾ .	Journal of Family e Community Medicine
Brandão RMS, Castro IO, Lins JMM, Campos MEL, Andrade MS, Guimarães MAS	Factors related to the conservation of vaccines in the basic health units ⁽²³⁾ .	Revista de Enfermagem UFPE On Line
Yuan L, Daniels S, Naus M, Brcic B	Vaccine storage and handling. Knowledge and practice in primary care physicians' offices ⁽²⁴⁾ .	The official jornal of the College of Family Physicians of Canada
Efe E, Oncel S, Ozer ZC	What do midwives in one region in Turkey know about cold chain? ⁽²⁵⁾ .	Midwifery

study (41.1%). Brazil was the country that presented the greatest quantitative of works, with 10 materials (58.8%). Spain, Nigeria, Saudi Arabia, Canada, Turkey, Germany and India had a publication each.

In the context of the nursing practice with vaccines, in the phase of the analysis it is primordial recognizing and exploring the attributes of the concept care with vaccines, to elucidate its nature and meaning. In it the characteristics of the concept that are presented more frequently are identified, when it is described or defined.

With this issue, the particularities or attributes are expressions used from words that describe the term investigated and represent an actual definition, an objection to a nominal definition that only alternate a synonym expression for another. It's the set of attributes that enables to identify the situation postulated in the concept⁽⁸⁾. According to the readings, the attributes of the care with vaccines can also be represented by their properties and benefits (Figure 3).

The antecedents and the consequents of a concept are related to the sociocultural, temporal, situational aspects of the professional category in the current context of analysis⁽⁸⁾. The antecedents represent the phenomena, situations or events that preexists the concept analyzed. They contribute to the understanding of the social scope in which the concept is commonly used, as well as help in its refinement. Thus, it is seeking to find the episodes that favor the emergence of the term care with vaccines. The consequents are applied to indicate neglected ideas or relationships relevant to new ways of investigation⁽⁸⁾. Then, the consequents constitute the application results of

the expression of interest, from the implications after the use of this same term (Figure 4).

The definition of the substitute expressions consists in the initial approximation with the concept of interest, in that these terms express the way to apply the concept in different ways from the term or word habitually used in the investigated materials⁽⁸⁾. For this, we search for the terms used in the texts, in a way to understand its origin, development,

Figure 3. Attributes of the concept care with vaccines.

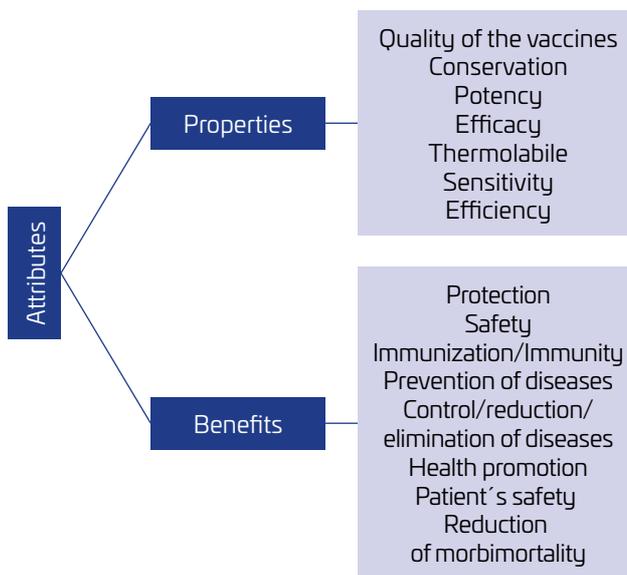
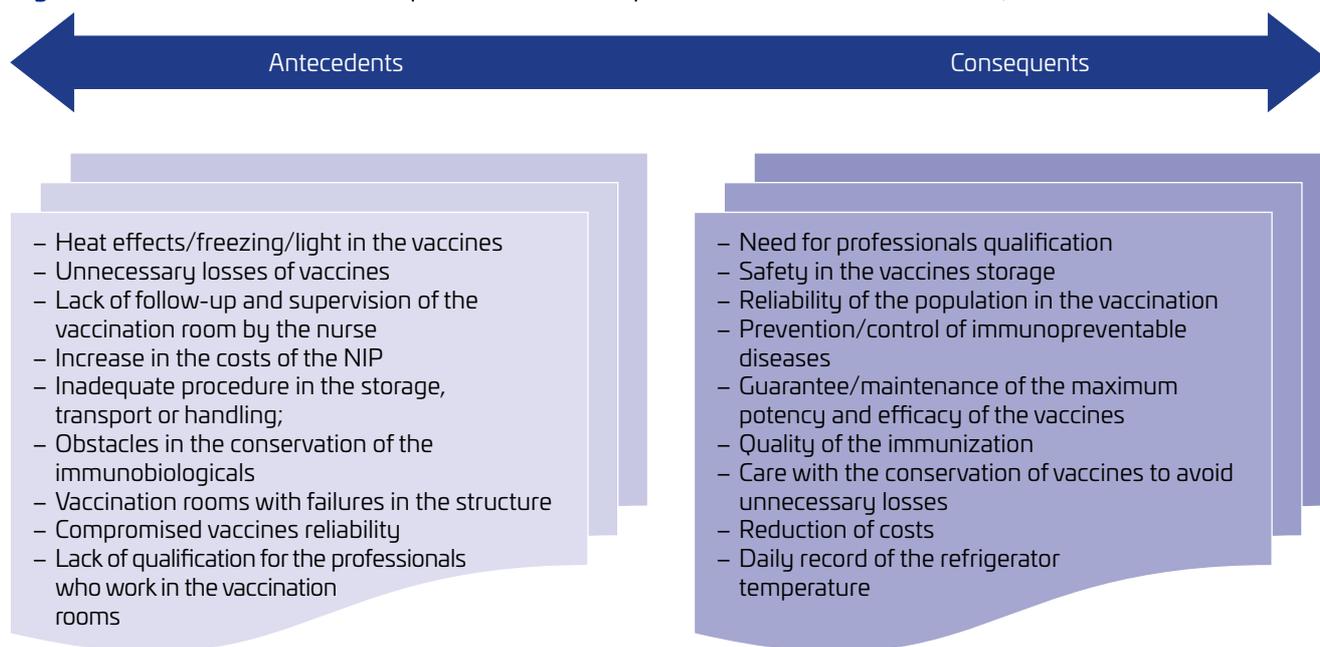


Figure 4. Antecedents and consequents of the concept care with vaccines. Natal/RN, 2019.



interconnections and functions of the concept with the several corresponding words.

The implications and hypotheses establish, respectively, the results and possibilities reached in the care with vaccines in the nursing context. They are elements inherent to the evolution of the concept over time and important so that new researches can be developed⁽⁸⁾.

DISCUSSION

Care with vaccines: attributes and concepts

The vaccines constitute comparable products in terms of effectiveness, safety and quality, and preserving its ideal properties has a positive impact on the population health conditions through the diseases eradication. In order to ensure the vaccines' immunity and potency it is essential the maintenance of the cold chain (CC) for conservation of these supplies in all the process, from production to administration in the persons, in order to be avoided alterations in its potency and composition, since they are sensitive to light, heat, humidity and freezing⁽²⁶⁻²⁹⁾.

The maintenance of the CC aims to ensure that the population receives efficient vaccines, with contribution for the control and eradication of immune preventable diseases. This factor contributes to the safe use of these supplies and strengthen the nursing care in this practice, in addition to promote the health^(28,29).

The concept are the actual expressions regarding a specific term⁽⁸⁾. In the selected articles, it is identified a scarcity of the concept care with vaccines, since it is not found in an explicit form in the publications.

Although the vaccination is a known activity, the concept care with vaccines is not clearly evidenced in the analyzed articles. This idea is addressed in the literature when affirming that the context that involves the vaccination field deserves a differentiated look, with more production of researches in this area because it is a current theme⁽³⁰⁾.

However, after a detailed reading, it is identified in one of the selected materials that the investigated phenomenon can be conceptualized as the essential care to ensure the vaccines effectiveness⁽⁹⁾. In the same way, for this care it is indispensable a rigid control of the conditions of the vaccines conservation, to ensure the immunization quality and effectiveness⁽¹⁰⁾. This opinion is strengthened by another article when emphasizing that the immunobiologicals need for adequate conservation, which requires installations, equipment and procedures of appropriate handling⁽¹⁷⁾.

Based on the above considerations, the concept analyzed needs to be expanded, by inserting other elements in its format, also indispensable in the care with vaccines. The research revealed that this concept is still much directed towards the

immunobiologicals' conservation. For such, terms such as health promotion, patient safety and professional qualification can be added, in order to contemplate the practice dimensions, of the professionals and of the population.

Concept care with vaccines: antecedents and consequents

In the face of the data found, it is understood that the antecedents are related to the aspects that compromise the maintenance of the immunobiologicals' quality. An aggravating factor in this process, considered as a critical event, is that many professionals have not basic knowledge on vaccines conservation. It is identified, therefore, the need of capacitation of the human resources, as well as the supervision of these professionals in the immunization practice, so that the handling with vaccines occur in accordance with the norms established by the NIP⁽²⁸⁾.

The possibility of a lack period in the updates of workers active in vaccination room favors that the care with these products is impaired. That way, variations in the temperature with immunobiologicals consist in a serious problem, with repercussion in its potency and efficacy. It is from the succession of small failures that the reliability in these substances is reduced and the costs to the health system are increased, with unnecessary loss in the supplies stock or use of these without effect in the population⁽²⁸⁾.

In addition, gaps in the storage, transport and handling procedures may interfere in the quality of the vaccines, which deteriorate after a certain length of time, due to their exposition to an inappropriate for their conservation. The structural questions in the vaccination room also deserves attention, since there are few works about the infrastructure analysis in these spaces^(28,31).

All these factors are indispensable in the care with vaccines. This way, the consequents are directly involved with the antecedents and, according to the Figure 4, are resulting from the investigated phenomenon. Thus, it arises the need for interventions that enable the development of a care related to the vaccination practice, with valorization of the role performed by the nursing team⁽³⁰⁾.

For that, it is important to invest in updating of the professionals, since the knowledge in vaccination are in constant transformation. Thus, the qualifications represent a conduct that favor the safety of the vaccines, with increase of their reliability and consequent adherence of the population. This process of qualification favors safe practices in immunization in the daily of the services, with benefits related to the vaccine-preventable diseases control and consequent improvement of the population's health^(30,31).

The effective results of the safe vaccination are conditioned on some indispensable aspects, such as properly trained workers, conservation and maintenance of the adequate

temperature of the immunobiologicals, in a way that the stock quality control is maintained in its maximum potency state, to ensure the patient's safety in this process. A Brazilian study carried out from an integrative review points out some measures to prevent vaccine stability and potency from being altered, among them, identifies the production of thermostable vaccines, stronger to adverse condition to the heat, and recommends adopting devices to monitor the exposures of these products to varied temperatures⁽²⁸⁾.

After that, some recommendations have been emphasized to avoid the unnecessary loss of vaccines, since the prejudice in the stock of these articles are very expensive to the system. Such need focuses on the importance of ensuring that the storing conditions of these products are met with the aim at ensuring the vaccines quality, in their maximum state of potency^(28,31).

From this point of view, the norms established by the NIP should be adopted to prevent the immunobiologicals from deteriorating, or occurring deficiency in the individuals' protection. However, ensuring the quality of vaccines still constitutes a challenge for the health professionals. However, for the public health, the immunobiologicals symbolize an excellent strategy of intervention and maintains one of the best cost-benefit ratios up till now adopted⁽²⁷⁾.

Terms related to the care with vaccines

For care with vaccines the substitute terms and the respective studies in which were located were: Preserve/ conserve vaccines/immunobiologicals^(9-11,21); Adequate practices in the process of conservation^(10,11,17,19,22,23); Maintenance of the stock safety⁽¹³⁾; Quality of conservation of the vaccines^(12,21); Quality of the care in vaccination room^(14,21); Quality of the care provided in the service^(10,14,17,20,21); and Service of immunization of quality⁽²¹⁾.

These terms substitutes for care with vaccines are expressions with similar meanings, identified on the basis of the reading of the selected articles. This way, it can be noticed that the more frequent term is related to the adequate practices in the conservation process, present in six materials researched.

The related concepts are suppositions that refer to other concepts worked in association with the one of interest. They enable a closeness with the concept investigated, but they are not synonyms, since acquire a new meaning⁽⁸⁾.

In the care with vaccines, the concepts related are made by two groupings: 1) structural and organizational suppositions of the vaccination room; 2) suppositions of education and conducts with the immunobiologicals.

For the grouping 1, the concepts related and the related studies in which its identification was possible are: Quality in the conservation and storage of the immunobiologicals^(12,13,17,19,20,23); Internal organization of

the refrigerators^(13,18,19,23); Adequate cleaning and defrosting of the equipment^(11,16-18,23); Knowledge, maintenance and management of the Cold Chain^(9,13,15,16,20); Monitoring, daily record and notification of changes in temperature^(11,13,15,17,19); Strict attention to storage, transport and handling^(10,17,19,22); Compliance with the recommendations of the NIP^(10,17).

In relation to the grouping 2, were found: Educational actions^(10,17,19-21,23); Investments in the training of professionals that work in vaccination room^(11,20,21); Supervision of these spaces by the nurse^(11,12,14,17-23); Surveillance actions^(17,19); Quality of the vaccines^(10-12,19,20,23); Control of the activities that involve handling of vaccines^(10,17); Establishing protocols of action^(9,18).

This way, the operational and organizational suppositions of the vaccination rooms, present in the grouping 1, involve the quality in the conservation and storage of immunobiologicals through the internal organization of the refrigerators, as well as the adequate cleaning and defrosting of these equipment. Thus, there are essential elements for the care with vaccines: the knowledge, maintenance and management of the Cold Chain; the monitoring, daily record and notification of changes in temperature; strict attention to storage, transport and handling; compliance with the technical recommendations of the NIP.

The suppositions of education and conducts with the immunobiologicals, evidenced in the grouping 2, strengthen the need of better practices to ensure the ideal potency of the vaccines, through educational actions, with more investments in the professionals' training who work in vaccination room. For this, the supervision of these spaces by the nurse represents one of the priorities due to the practice of immunization be a competence of the nursing.

For this supposition, there is also the importance of surveillance actions to strengthen the quality of the vaccines, with control of the activities that involve the vaccines' handling. This way, establishing protocols of action influence positively the care with vaccines and constitutes a basilar axis for the safety with these products.

Implications and hypotheses of the concept care with vaccines

From the selected materials, these terms are specified and followed by the number of the study in which they were identified. With this, the implications and hypotheses are: Quality assurance and/or vaccines conservation^(10-12,14); Education process for the work in vaccination room in a continuous form^(21,22); Qualified professionals^(11,12,14,16,18,21,23); Quality and/or safety of the vaccines^(14,19,22,23); Efficiency, efficacy and effectivity in the vaccines conservation⁽¹⁰⁾; Guarantee of a quality care in vaccination room⁽¹⁴⁾.

It is noted that the work with vaccines can represent an encouraging tool for the improvement and the safe exercise

of these products use⁽¹⁰⁾. This context requires the nurse establishes priorities of actuation and a greater participation in the actions of qualification of its team, in a way of contributing to care quality, directly related to the knowledge of the professionals and the care management⁽³⁰⁾.

From this perspective, there is a need to understand this care in a continuous, dynamic form and of constant improvement for the involved professionals. To this end, these workers need to be able to adapt to changes, through updating e their knowledges, mediated by trainings and recycling of the team⁽¹⁰⁾. All this process is important due to the introduction of new vaccines in the immunization schedule and increase of age group with recommendation for immunization⁽³⁰⁾. Therefore, these elements constitute strategic measures for the immunization activities present in the nursing practice.

With this, it is believed in the hypothesis of that the care with vaccines requires periodical updating by the nursing professionals, in order to favor the efficacy and safety of these supplies. It is possible that the trainings contribute to improve the work process and promote the patients' satisfaction.

Therefore, the terms found in this study provide implications for the care with vaccines, once the nursing strengthens knowledges through the understanding of concepts in an increased manner and its correct use.

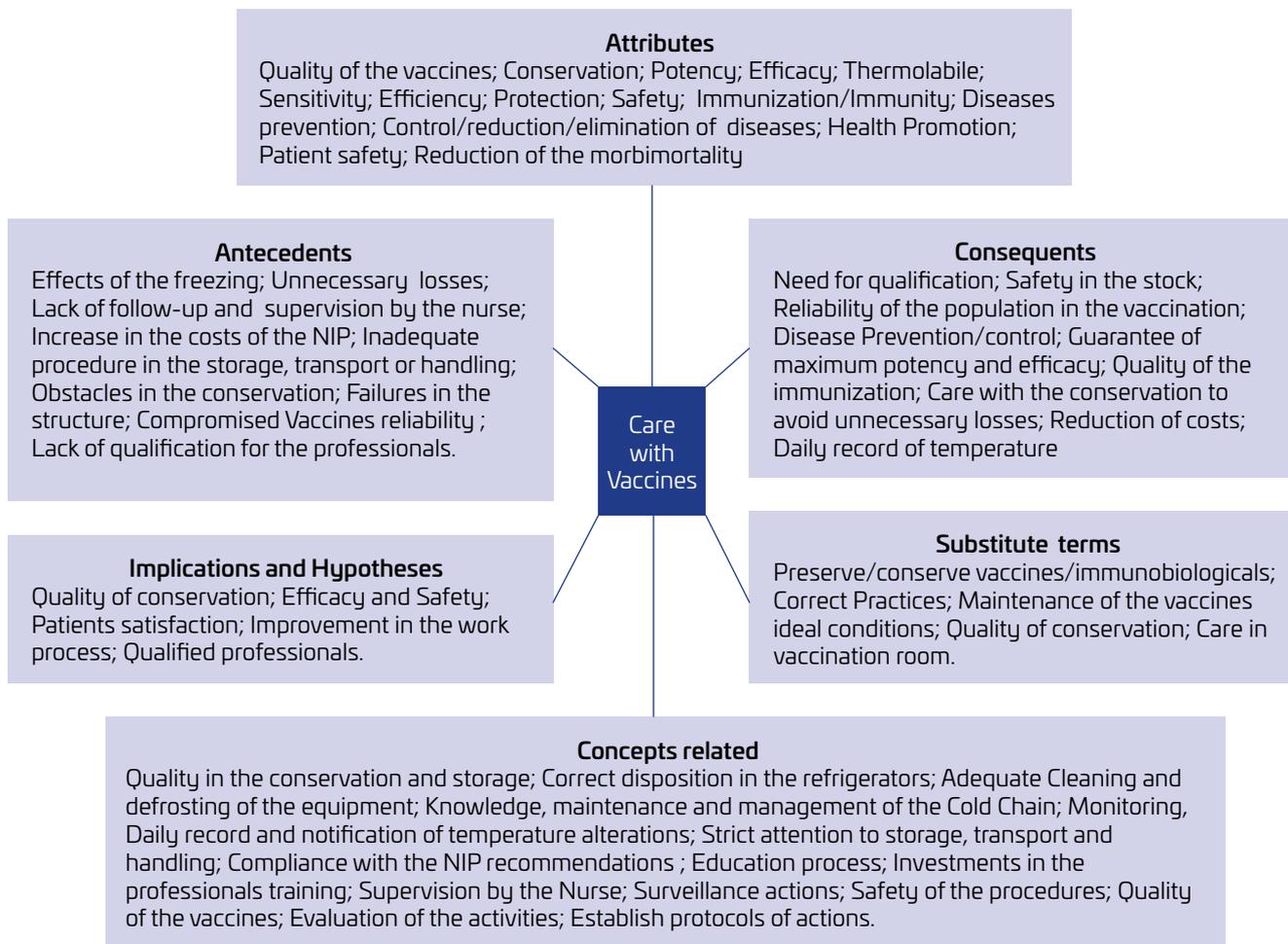
The importance and continuity of future researches for the design of the concept care with vaccines should be understood with the purpose to refine investigations for the application and use of this concept by the nursing.

As a way of schematizing the one that was discussed in the study, we elaborated a synthesis of the terms associated with the care with vaccines (Figure 5).

CONCLUSION

From the Evolutionary Method of Rodgers, it can be noted that the analysis of the concept care with vaccines became better understood, although there is some need for more investigations. This detail about the phenomenon in question may contribute for the nursing assistance with vaccines when establishing more effective actions.

Figure 5. Synthesis of the terms associated to the concept care with vaccines.



That way, on the basis on the results found, the identification of the terms enables the formulation of the concept care with vaccines: it is an intervention characterized as a continuous process, edified through qualifiers aspects for maintaining the potency and efficacy of the immunobiological that involve managerial, organizational, infrastructural dimensions, and present relationships with the need for adaptation to changes, with introduction of new habits, coming from updates of nursing professionals, which allow responsible and safe conducts for preservation of the vaccines, in the perspective of ensuring benefits for the population in general.

Given the above, the concept analysis, in spite of being complex, contributes to the support and consolidation of knowledge in the nursing, with subsidies for the promotion of safe practices, as well as new reflections about the care with vaccines.

REFERENCES

- Salbego C, Dornelles CS, Greco PBT, Pradebon VM, Alberti GF. Significado do cuidado para enfermagem de centro cirúrgico. *Rev Rene* [Internet]. 2015 [cited on Dec. 3, 2018];16(1):46-53. Available at: <http://www.revistarene.ufc.br/revista/index.php/revista/article/viewFile/1893/pdf>. <http://doi.org/10.15253/2175-6783.2015000100007>.
- Thofehrn MB, Montesinos MJL, Arrieira IC, Àvila VC, Vasques TCS, Farias ID. Nurses' work process in a hospital in Spain: emphasis on the technologies of care. *Cogitare Enferm* [Internet]. 2014 [cited on Dec. 3, 2018];19(1):141-6. Available at: <http://revistas.ufpr.br/cogitare/article/view/35972/22180>.
- Fossa AM, Protti AM, Rocha MCP, Horibe TM, Pedroso GER. Conservação e administração de vacinas: a atuação da enfermagem. *Saúde Rev* [Internet]. 2015 [cited on Dec. 3, 2018];15(40):85-96. Available at: <https://www.metodista.br/revistas/revistas-unimep/index.php/sr/article/view/2538/1475>. <http://dx.doi.org/10.15600/2238-1244/sr.v15n40p85-96>.
- Brasil. Ministério da Saúde. Manual de Normas e Procedimentos para Vacinação. Brasília: Ministério da Saúde; 2014.
- Oliveira VC, Caveião C, Crosewski F. Nursing management in the control of avoidable losses of immunobiological preparations. *Cogitare Enferm* [Internet]. 2014 [cited on Dec. 12, 2018];19(4):679-86. Available at: <http://revistas.ufpr.br/cogitare/article/view/36358/23921>.
- Pereira DDS, Neves EB, Gemelli M, Ulbricht L. Análise da taxa de utilização e perda de vacinas no programa nacional de imunização. *Cad Saúde Colet* [Internet]. 2013 [cited on Dec. 20, 2018];21(4):420-4. Available at: <http://www.scielo.br/pdf/cadsc/v21n4/v21n4a10.pdf>. <http://dx.doi.org/10.1590/S1414-462X2013000400010>.
- Giovelli G, Cardoso SMM, Fontana RT, Rodrigues FCP, Brum ZP. Nursing technicians' perceptions regarding the occupational risks in vaccination rooms. *Cogitare Enferm* [Internet]. 2014 [cited on Dec. 20, 2018];19(2):330-6. Available at: <http://revistas.ufpr.br/cogitare/article/viewFile/37006/22814>.
- Rodgers BL. Concept Analysis: an evolutionary. In: Rodgers BL, Knaf KA, editores. *Concept development in nursing: foundations, techniques, and applications*. Philadelphia: Saunders; 2000. p. 77-102.
- Barber-Hues C, Rodriguez-Sánchez O, Cervera-Pérez I, Peiró S. La cadena de frío vacunal en un departamento de salud de la Comunidad Valenciana. *Gac Sanit* [Internet]. 2009 [cited on Dec. 20, 2018];23(2):139-43. Disponível: <http://scielo.isciii.es/pdf/gsv/v23n2/breve1.pdf>. <http://dx.doi.org/10.1016/j.gaceta.2008.03.003>.
- Oliveira VC, Gallardo MDPS, Cavalcante RB, Arcêncio RA, Pinto IC. Fragilidades da conservação de vacina nas Unidades de Atenção Primária à Saúde. *Rev Bras Enferm* [Internet]. 2015 [cited on Dec. 20, 2018];68(2):291-6. Disponível: <http://www.scielo.br/pdf/reben/v68n2/0034-7167-reben-68-02-0291.pdf>. <http://dx.doi.org/10.1590/0034-7167.2015680215i>.
- Oliveira VC, Guimarães EAA, Guimarães IA, Januário LH, Pinto IC. Prática da enfermagem na conservação de vacinas. *Acta Paul Enferm* [Internet]. 2009 [cited on Dec. 20, 2018];22(6):814-8. Available at: <http://www.scielo.br/pdf/ape/v22n6/a14v22n6.pdf>. <http://dx.doi.org/10.1590/S0103-21002009000600014>.
- Oliveira VC, Gallardo MDPS, Arcêncio RA, Gontijo TL, Pinto IC. Avaliação da qualidade de conservação de vacinas na Atenção Primária à Saúde. *Ciência Saúde Coletiva* [Internet]. 2014 [cited on Dec. 20, 2018];19(9):3889-98. Available at: <http://www.scielo.br/pdf/csc/v19n9/1413-8123-csc-19-09-3889.pdf>. <http://doi.org/10.1590/1413-81232014199.12252013>.
- Mallik S, Mandal PK, Chatterjee C, Ghosh P, Manna N, Chakrabarty D, et al. Assessing cold chain status in a metro city of India: an intervention study. *Afr Health Sci* [Internet]. 2011 [cited on Dec. 20, 2018];11(1):128-33. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3092313/pdf/AFHS1101-0128.pdf>.
- Ferreira AV, Freitas PHB, Viegas SME, Oliveira VC. Acesso à sala de vacinas da estratégia saúde da família: aspectos organizacionais. *Rev Enferm UFPE on line* [Internet]. 2017 [cited on Dec. 20, 2018];11(10):3869-77. Available at: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/viewFile/69709/24321>. <https://doi.org/10.5216/ree.v19.42468>.

15. Thielmann A, Viehmann A, Weltermann BM. Effectiveness of a web-based education program to improve vaccine storage conditions in primary care (Keep Cool) study protocol for a randomized controlled trial. *Trials* [Internet]. 2015 [cited on Dec. 20, 2018];16:301-9. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4501106/pdf/13063_2015_Article_824.pdf. <https://doi.org/10.1186/s13063-015-0824-9>.
16. Ferreira AV, Oliveira CF, Guimarães EAA, Cavalcante RB, Moraes JT, Oliveira VC. Acesso à sala de vacinas nos serviços de atenção primária à saúde. *Rev Eletr Enf* [Internet]. 2017 [cited on Dec. 20, 2018];19:a31. Available at: <https://www.revistas.ufg.br/fen/article/view/42468/24010>. <http://dx.doi.org/10.5216/rev.v19.42468>.
17. Siqueira LG, Martins AMEBL, Versiani CMC, Almeida LAV, Oliveira CS, Nascimento JE, et al. Avaliação da organização e funcionamento das salas de vacina na atenção primária à saúde em Montes Claros, Minas Gerais, Brasil, 2015. *Epidemiol Serv Saúde* [Internet]. 2017 [cited on Dec. 20, 2018];26(3):557-68. Available at: <http://www.scielo.br/pdf/ress/v26n3/2237-9622-ress-26-03-00557.pdf>. <http://doi.org/10.5123/S1679-49742017000300013>.
18. Raglione D, Bezerra GAM, Lopes MH, Nerger MLBR, Guimarães TC, Sartori AMC. Avaliação da rede de frio para conservação de vacinas em unidades básicas de saúde das regiões Sul e Centro-Oeste do município de São Paulo em 2011-2012. *Epidemiol Serv Saúde* [Internet]. 2016 [cited on Dec. 20, 2018];25(1):65-74. Available at: <http://www.scielo.br/pdf/ress/v25n1/2237-9622-ress-25-01-00065.pdf>. <http://doi.org/10.5123/S1679-49742016000100007>.
19. Vasconcelos KCE, Rocha AS, Ayres JA. Avaliação normativa das salas de vacinas na rede pública de saúde do Município de Marília, Estado de São Paulo, Brasil, 2008-2009. *Epidemiol Serv Saúde* [Internet]. 2012 [cited on Dec. 20, 2018];21(1):167-76. Available at: <http://scielo.iec.gov.br/pdf/ess/v21n1/v21n1a17.pdf>. <http://doi.org/10.5123/S1679-49742012000100017>.
20. Ogboghodo EO, Omuemu VO, Odijie O, Odaman OJ. Cold chain management practices of health care workers in primary health care facilities in Southern Nigeria. *Pan Afr Med J*. [Internet]. 2017 [cited on Dec. 20, 2018];27:34. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5516677/pdf/PAMJ-27-34.pdf>. <https://dx.doi.org/10.11604/2Fpamj.2017.27.34.11946>.
21. Oliveira VC, Rennó HMS, Santos YR, Rabelo AFG, Gallardo MPS, Pinto IC. Educação para o trabalho em sala de vacina: percepção dos profissionais de enfermagem. *R Enferm Cent O Min* [Internet]. 2016 [cited on Dec. 20, 2018];6(3):2331-41. Available at: <http://www.seer.ufsj.edu.br/index.php/recom/article/view/1180/1166>. <http://doi.org/10.19175/recom.v6i3.1180>.
22. Mugharbel KM, Wakeel SMA. Evaluation of the availability of cold chain tools and an assessment of health workers practice in Dammam. *J Fam Community Med* [Internet]. 2009 [cited on Dec. 20, 2018];16(3):83-8. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3377047>.
23. Brandão RMS, Castro IO, Lins JMM, Campos MEL, Andrade MS, Guimarães MAS. Factors related to the conservation of vaccines in the basic health units. *Rev Enferm UFPE on line* [Internet]. 2012 [cited on Dec. 20, 2018];6(2):332-8. Available at: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/7034/6287>.
24. Yuan L, Daniels S, Naus M, Brcic B. Vaccine storage and handling. Knowledge and practice in primary care physicians' offices. *Can Fam Physician* [Internet]. 1995 [cited on Dec. 20, 2018];41:1169-76. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2146189/pdf/canfampphys00089-0039.pdf>.
25. Efe E, Oncel S, Ozer ZC. What do midwives in one region in Turkey know about cold chain?. *Midwifery* [Internet]. 2008 [cited on Dec. 20, 2018];24(3):328-34. Available at: <https://doi.org/10.1016/j.midw.2006.11.002>.
26. Barata-Silva C, Hauser-Davis RA, Silva ALO, Moreira JC. Desafios ao controle da qualidade de medicamentos no Brasil. *Cad Saúde Col* [Internet]. 2017 [cited on Dec. 29, 2018];25(3):362-70. Available at: <http://www.scielo.br/pdf/cadsc/v25n3/1414-462X-cadsc-1414-462X201700030075.pdf>. <http://doi.org/10.1590/1414-462X201700030075>.
27. Crosewski F, Larocca LM, Chaves MMN. Perdas evitáveis de imunobiológicos na instância local: reflexões acerca do processo de trabalho da enfermagem. *Saúde Debate* [Internet]. 2018 [cited on Dec. 29, 2018];42(116):203-13. Available at: <http://www.scielo.br/pdf/sdeb/v42n116/0103-1104-sdeb-42-116-0203.pdf>. <http://doi.org/10.1590/0103-1104201811616>.
28. Guimarães EAA, Oliveira VC, Oliveira MM, Viegas SME, Ferreira AP, Dias FCS. Eventos críticos na manutenção da conservação de vacinas. *Rev Enferm UFPE on line*. [Internet]. 2018 [cited on Dec. 29, 2018];12(6):1781-9. Available at: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/230909/29231>. <https://doi.org/10.5205/1981-8963-v12i6a230909p1781-1789-2018>.

29. Melo LTG, Coutinho RMC. Avaliação da prática de profissionais de enfermagem no processo de conservação de vacinas no município de Campinas. *J Health Sci Inst* [Internet]. 2018 [cited on Dec. 29, 2018];36(1):28-33. Available at: https://www.unip.br/presencial/comunicacao/publicacoes/ics/edicoes/2018/01_jan-mar/V36_n1_2018_p28a33.pdf.
30. Martins JRT, Alexandre BGP, Oliveira VC, Viegas SMF. Educação permanente em sala de vacina: qual a realidade? *Rev Bras Enferm* [Internet]. 2018 [cited on Dec. 29, 2018];71(Suppl. 1):715-24. Available at: http://www.scielo.br/pdf/reben/v71s1/pt_0034-7167-reben-71-s1-0668.pdf. <http://dx.doi.org/10.1590/0034-7167-2017-0560>.
31. Elisiário RN, Siman AG, Moreira TR, Carvalho CA, Amaro MOF. Avaliação das salas de vacinas nas unidades de estratégia de saúde da família. *Enferm Rev* [Internet]. 2017 [cited on Dec. 29, 2018];20(3):1-17. Available at: <http://periodicos.pucminas.br/index.php/enfermagemrevista/article/view/17228/13050>.

