



APPLYING THE THEORY OF SCIENTIFIC REVOLUTIONS IN THE CONSTRUCTION OF A NEW FIELD OF OBSTETRIC NURSING

APLICANDO A TEORIA DAS REVOLUÇÕES CIENTÍFICAS NA CONSTRUÇÃO DE UM NOVO CAMPO DA ENFERMAGEM OBSTÉTRICA

APLICANDO LA TEORÍA DE LAS REVOLUCIONES CIENTÍFICAS EN LA CONSTRUCCIÓN DE UN NUEVO CAMPO DE LA ENFERMERÍA OBSTÉTRICA

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ABSTRACT

Objective: to discuss the paradigmatic crisis of the obstetric field in the light of the philosophy of science proposed by Thomas Kuhn and the participation of obstetric nursing in the scientific revolution that proposes the humanistic paradigm in childbirth care. **Method:** article of theoretical reflection on the basis of four analytical categories: 1) Technocratic paradigm: normal science; 2) Influences of the feminist movement and new propositions in the obstetric field: the paradigmatic crisis; 3) Humanization of childbirth: the scientific revolution; and 4) Non-invasive health care technologies: cleaning procedures of the humanistic paradigm. **Results:** we are in the transition from the technocratic paradigm to the humanistic paradigm. Obstetric nursing has an important scientific production related to this issue and it reflects the participation of this group in the proposition of cleaning procedures. Among them, we can mention the proposition of non-invasive health care technologies. **Conclusion:** this scientific revolution fosters new propositions, changes values and modifies the integration of social actors (health professionals, users and society) in the scenario of childbirth. **Descriptors:** Women's Health; Obstetric Nursing; Philosophy In Nursing.

RESUMO

Objetivo: discutir a crise paradigmática do campo obstétrico à luz da filosofia da ciência proposta por Thomas Kuhn e a participação da enfermagem obstétrica na revolução científica que propõe o paradigma humanístico na atenção ao parto e nascimento. **Método:** artigo de reflexão teórica com base em quatro categorias analíticas: 1) Paradigma tecnocrático: a ciência normal; 2) Influências do movimento feminista e as novas proposições no campo obstétrico: a crise paradigmática; 3) Humanização do parto e nascimento: a revolução científica; e 4) Tecnologias não invasivas de cuidado: operações de limpeza do paradigma humanístico. **Resultados:** estamos na transição do paradigma tecnocrático para o paradigma humanístico. A enfermagem obstétrica tem uma produção científica importante relacionada a esta temática e isto reflete a participação deste grupo na proposição de operações de limpeza. Dentre elas, podemos citar a proposição das tecnologias não-invasivas de cuidado. **Conclusão:** esta revolução científica fomenta novas proposições, muda valores e modifica a inserção dos atores sociais (profissionais de saúde, usuáries e sociedade) no cenário do parto e nascimento. **Descritores:** Saúde da Mulher; Enfermagem Obstétrica; Filosofia em Enfermagem.

RESUMEN

Objetivo: discutir la crisis paradigmática del campo obstétrico a la luz de la filosofía de la ciencia propuesta por Thomas Kuhn y la participación de enfermería obstétrica en la revolución científica que propone el paradigma humanista en la atención del parto. **Método:** artículo de reflexión teórica con base en cuatro categorías analíticas: 1) Paradigma tecnocrático: la ciencia normal; 2) Influencias del movimiento feminista y las nuevas propuestas en el campo obstétrico: la crisis paradigmática; 3) La humanización del parto: la revolución científica; y 4) Tecnologías no invasivas de cuidado: procedimientos de limpieza del paradigma humanista. **Resultados:** estamos en la transición del paradigma tecnocrático al paradigma humanista. La enfermería obstétrica tiene una importante producción científica relacionada con este tema y esto refleja la participación de este grupo en la propuesta de procedimientos de limpieza. Entre ellas podemos mencionar la propuesta de tecnologías no invasivas de cuidado. **Conclusión:** esta revolución científica fomenta nuevas propuestas, cambia valores y modifica la integración de los actores sociales (profesionales de la salud, usuarios y sociedad) en el escenario del parto. **Descriptores:** Salud de la Mujer; Enfermería Obstétrica; Filosofía en Enfermería.

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INTRODUCTION

In 1962, Thomas Samuel Kuhn published the book "Structure of scientific revolutions". He became known not as a physicist, but as an intellectual geared towards the history and philosophy of science. The repercussion of this study was significantly relevant and considered a watershed regarding studies on science.¹ Kuhn's work is based on three basic concepts: normal science; paradigm; and scientific revolution.

Normal science is characterized by research based on one or more past scientific achievements. They are recognized during a specific time by a specific scientific community, providing foundations for future practice. According to Kuhn, the scientific community knows what the world is like through normal science. This is the assumption that underpins all scientific knowledge considered true.²

The concept of paradigm is associated with search activity aiming at the transformation and expansion of knowledge. It comes close to the idea of a knowledge map dominated by a given group (scientists). The idea of this knowledge map is associated with the idea of the existence of a basic level of knowledge that would exist as required to support the design and reception of scientific issues.² While practicing normal science, the researchers deal—in an homogeneous way—with ontological, epistemological and methodological issues.¹

There are five stages for the development of a field of paradigms, they are: 1) there is investigation because the paradigm is not mature. The debates about fundamental issues are frequent among scientists that reach no consensus with respect to methods, thematic or important results; 2) there is a conviction with respect of one of the viewpoints that ultimately become relevant and visible, establishing themselves as dominant opinion. This way, the new paradigm emerges originating normal science; 3) this stage is characterized by the crisis. There is accumulation of anomalies, with evident weakening of the paradigm; 4) there is a revolution, with the replacement of the old paradigm; and 5) in this final stage the long life of the new paradigm created starts. This stage is considered normal for science.²

Another important term is called "scientific revolution". It represents the changes that subvert the existing tradition of scientific practice. They are the disintegrator complements of the tradition to which normal science activity is linked. They are

extraordinary episodes comprising changes in the professional commitments of a scientist community. Thus, the revolution is characterized by non-cumulative development episodes, in which an older paradigm is wholly or partially replaced by a new paradigm, incompatible with the previous one.²

Since the 1990s, obstetric nursing has been reviewing its health care practice, influenced by women's movements and subsidized by national and international public policies. In this scenario, it is increasingly taking ownership of different theoretical and methodological references in order to support their ideological propositions in the daily life of health care provided to women.³⁻⁹ Only 20 years later we understood that at that time we were living a paradigmatic crisis and that the new paradigmatic proposition would be triggering a scientific revolution. In times of crisis, we are capable to build a philosophy; because practice provides an intense reflection: Why do I do this and not that? We start experiencing the new way and this restlessness illuminates us.²

This description can certainly explain philosophically the professional experience of many obstetric nurses. Trained according to the fundamentals of the technocratic or biomedicine paradigm¹⁰ during the 1980s, we learned obstetrics in a field of practice highly interventionist and renowned in the city of Rio de Janeiro, Brazil. After graduated, we started our professional activities in healthcare institutions that were also based on this model. We considered ourselves competent and professionally recognized by performing the techniques considered correct at that time and by adopting authoritarian and punitive attitudes towards women we cared for. That was our conceptual experience and our professional reference on how 'to be' an obstetric nurse.¹¹

During the revolutions, scientists see new and different things when. By using familiar instruments, they look at the same issues previously examined. What people see depends both on what they look at and what the visual and conceptual prior experience taught them to see.¹² Human beings have difficulty in renewing their concepts and rethinking their way of seeing the world.²

In this context, we believe that it is necessary to deepen this discussion, not only considering the political or social field, but also the field of science philosophy. Therefore, this study is a theoretical reflection that aims to discuss the paradigmatic crisis of the obstetric field in the light of the philosophy of science proposed by

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Kuhn and the participation of obstetric nursing in the scientific revolution, which proposes the humanistic paradigm in childbirth care.

♦ **Technocratic paradigm: normal science**

In normal science, research is based on one or more past scientific achievements. It is cumulative knowledge that takes into account everything that happened over time and is considered relevant data for the construction of knowledge. These scientific achievements are recognized by any specific scientific community and provide the theoretical foundations for later practice. These achievements have two fundamental characteristics: they are unprecedented achievements, novelties that aim to attract a group of individuals; and they are open or generic accomplishments that enable the group that joined this paradigm to overcome situations/problems that may arise.²

If a scientist or a first group of subjects produces any synthesis that can convince and bring to them most of the professionals, older schools will eventually disappear gradually. Within the framework of a paradigm, the scientific fact—what Kuhn calls "puzzle"—exists so that scientists can solve it and provide appropriate tools for its solution.¹⁻²

That is how the technocratic model of health care emerged in the late 18th century, a period in which science adopted the control of nature as a goal.¹³ This model suffered strong influence of capitalism and transformed medicine in a profession that started targeting production and profit.¹⁴ In turn, this model adopted the view that mind and body are separated, considering that the body functions like a machine. It works in a fragmented way and is regarded as an object of study and controlled by medicine.^{4,10,15}

We can mention some more elementary and theoretical generalizations of the technocratic paradigm, such as: childbirth with medical event and potentially hazardous; mandatory lithotomy position for childbirth; zero diet; removal of the family; restriction to bed during all childbirth period; routine use of enema and trichotomy; infusion of oxytocin in order to "fix" the inability of endogenous production by parturient women; and performance of routine episiotomy to preserve a perineum unable to dilate properly, among other interventions.^{10,15-8}

♦ **Influences of the feminist movement and new propositions in the obstetric field: the paradigmatic crisis**

The paradigmatic crisis that preceded the humanistic paradigm began in the 1970s with the feminist movement. At that time, the struggle of feminists had the affirmation of women's right to decide whether to have children or not as their motto, because it was urgent to question compulsory motherhood, considered up to then as the compulsory destination of any woman called normal.^{13,15} Motherhood should be voluntary, a woman's choice, and never an imposition of society. In this sense, there was a fight to ensure women the free access to information, contraception methods and abortion.¹⁹

Later, in the 1980s, the feminist movement denounced that motherhood was experienced under conditions of oppression, even with women's conscious choice.^{4,13,19} It was the established paradigm, the technocratic paradigm that: depersonalized women; considered the female body as defective; addressed childbirth as pathological and risk event; and used aggressive, invasive and potentially dangerous technology.¹⁰

Feminist movements were involved in several areas of knowledge, including clinical research, and one of the propositions coming from this era was evidence-based medicine, presented by the World Health Organization (WHO): "the objective of the assistance is to have healthy mother and child with the least possible intervention that is compatible with safety".³ This new approach involved considering that there should be a valid reason to intervene on the natural process of a normal childbirth.

In the early 1990s, there were important transformations in the world capitalist system, giving rise to the process of globalization, a new name for the former internationalization process of the world market born from capitalism itself.¹⁴ After the informational revolution (also called the third technological revolution), the process of globalization brought changes in working relationships, national and international trade, the context of production, finance, the political sphere, and numerous aspects of social life.¹⁴

In October 1993, groups of professionals connected to women's health gathered in the city of Campinas, State of São Paulo, Brazil, in order to discuss the conditions of birth in Brazil. They prepared a document called "Letter from Campinas", which was forwarded to the Ministry of Health and subsidizes a number of changes in the scenario of childbirth care.^{13,20}

Strategies and instruments were discussed in these debates in order to develop actions

of the Program for Integral Assistance to Women's Health (PAISM), especially those aspects related to quality and humanization of health care provided during pregnancy, childbirth and puerperium. There was also dissemination and adherence of the WHO recommendations made at the international conference held in Fortaleza, State of Ceará, Brazil (1985), regarding appropriate technologies used during childbirth. This event advocated support for initiatives of humanization of childbirth in public and private services, birth centers, traditional midwives groups, doulas, and non-governmental organizations.²⁰

Only at the end of the 1990s, the expression "childbirth humanization" began to be used by the Ministry of Health. It referred to public policies promoted with support from international organizations (WHO, PAHO, and the World Bank) and the collaboration of social actors, non-governmental organizations and professional bodies. The measures implemented by the Ministry of Health, aiming at promoting health care humanization, contemplated the reduction of cesarean section rates and sought to promote the role of obstetric nurses in health care during natural childbirth.^{5,21}

The term "obstetric care humanization" expressed a change in understanding childbirth as a human experience. Humanized health care involves a set of knowledge, practices and attitudes that aim at the promotion of healthy childbirth and the prevention of maternal and perinatal morbimortality using non-interventionist technology, contrary to the model deployed for decades in Brazil.¹⁹

The historical retrospective presented makes us realize that there were some failures in the normal activity of the technocratic paradigm with regard to troubleshooting— anomalies seem to be more than a new puzzle. Now is the time to renew the instruments.² In these paradigmatic crisis, the paradigm hitherto adopted will not be abandoned until other paradigm proves to be superior in virtually every aspect.^{2,22}

The anomalies that threaten the paradigm in its very foundations generate critical moments, because the consensus gives way to the division and the formation of groups that seek other theories and fundamentals.¹ Kuhn calls this critical period "extraordinary science".² These facts have generated a crisis in the technocratic or biomedicalized paradigm, which was until then considered normal science. Relying on Kuhn's concepts,² the new model was preceded by a period of

great professional insecurity and demanded the deconstruction of the concepts of gestation, delivering and being born.⁴ This phenomenon caused major changes in the problems and techniques of normal science. These events are evidence of the search for new rules, which originated the proliferation of versions of a new model, which are symptoms of the crisis.²³

From this crisis, we confirmed the anomalies that threatened and still threaten the technocratic paradigm in its very foundations, thus creating critical moments. Groups that sought other theories and grounds based on the humanized model of childbirth care were created in order to address the model, thus giving way to the "extraordinary science".⁴

These new scientific achievements are reported in scientific manuals, books and articles, among others.^{8-9,16-18,24} These publications expose the body of the new theory, illustrate its successful applications and compare these applications with observations and exemplary experiences, as described in the "Safe Motherhood Manual - assistance to natural childbirth: a practical guide".³ This document also proposes obstetric nurses and midwives as providers of health care and most appropriate responsible professionals for normal childbirth care.

We can observe that the previous paradigm—called technocratic or biomedicalized—did not feature satisfactory results for maternal health any longer, with high rates of maternal morbimortality, users' dissatisfaction, iatrogenic disease in the perinatal period, and high rates of cesarean sections, among others.^{4-5,15,19} Hence the beginning of a paradigmatic crisis that triggered the process of transition to a new paradigm called "humanistic paradigm".^{2,10} Experiencing a paradigmatic crisis brings the prospect of renewal, creation, and establishes a distance from paralyzing ideological deformations.²³

The transition from a paradigm in crisis to a new paradigm, from which a new tradition of normal science can arise, is far from being a cumulative process.^{2,22} In this case, there will be no articulation with knowledge from the old paradigm; there will be a dramatic rupture that will require rebuilding the area of study from new principles.¹ This reconstruction changes some elementary theoretical generalizations of the paradigm, as well as many of its methods and applications.^{2,22-23}

According to Kuhn, the paradigmatic crises may end in one of three ways: sometimes,

normal science is able to address the problem that causes the crisis; other times, the problem even resists the new approaches without being solved and then it is put aside to be resolved by a future generation with more elaborated instruments; or a crisis may end with the emergence of a new paradigm candidate.²

♦ Humanization of childbirth: the scientific revolution

By rescuing the meaning of paradigm, Kuhn states that it is the social construction of a model or a specific concept that will be considered new or renovated and incorporated into the daily life of individuals.² The scientific benchmark adopted by the humanistic paradigm is based on scientific achievements that annul previous knowledge. This is what Kuhn calls unprecedented achievements.² Paradigm is a fundamental concept to understand the progress of science.¹

This reconstruction changed some elementary theoretical generalizations of the previous paradigm (technocratic paradigm) and adopted new fundamentals for humanized practice, such as: childbirth is a physiological and natural event; women should be free to adopt the position they want during labor and delivery; the presence of an escort during the whole process of childbirth and immediate postpartum is fundamental; the encouragement of non-pharmacological methods for pain relief (massage, warm water and free movement, among others); hypercaloric diet at the discretion of women; and the protection of the perineum, rather than routine episiotomies, among others.^{3,8,16-18,24}

Based on Kuhn's premises,² all normal scientific research related to childbirth care has been guided by the premises of the new humanistic paradigm. In this case, all cleaning procedures have been making efforts to confirm, test, validate, and evaluate the new fundamentals of humanized practice.^{3,8,16-18,24} Knowledge production is a legitimizing and supporting strategy for new practices adopted that are proposed by the new paradigm.¹³

The philosophical bases of the humanistic paradigm are located in two premises: rescue of the central role of women in the active process of pregnancy and childbirth; and the high incidence of maternal mortality that have occurred in the last 30 years.^{5,7,19}

The policy proposed by the Ministry of Health is based on the principles of humanization and quality of health care. These are essential conditions for health

actions to be transformed into the resolution of the problems identified, users' satisfaction, strengthening of women's capacity to identify their demands, recognition and claim of their rights, and promotion of self-care. Within this prospect, women are seen as subject of their citizenship.⁵

This model questions the authoritarianism that the technocratic model advocated in all areas of health knowledge. In the context of women's health, in particular at parturition, humanism raises women to the condition of citizens, giving them the right to choose. It values the participation of the family and believes that the processes of pregnancy and childbirth are physiological, female and of human nature.²⁴

In the humanistic paradigm, the focus of health professionals is prevention and health promotion.⁵ Death can be considered and accepted as a result of the process. Regarding the adoption of institutional conduct and users' needs—not only the needs of the institution—are considered relevant.^{3,10}

In this context, there is a possible connection, i.e., the interaction between users and health professionals, in which individualities, emotional support and family involvement are valued. This action relates human beings to the way they would like to be treated, that is, with respect, consideration and kindness. The job object is care/cure centered on relationships and human interaction.^{3,7,10}

This way, it is possible to visualize the construction of a therapeutic conduct from information and shared responsibility between the social actors of the relationship, valuing the empathy as important element for exchange and interaction.¹⁵ Information becomes essential with the purpose of empowering individuals, so that they can share the responsibilities and be autonomous with respect to their health and their disease. To that end, they must understand their diagnosis, prognosis and treatment possibilities.^{10,19} Information is crucial to the full exercise of citizenship. In this way, users and their families will be aware of the right of ownership/empowerment, perceiving when they are respected or disrespected. These rights are what we call sexual and reproductive rights.^{13,15}

We believe that, at this historic moment, we live with two paradigms. We are going through the transition from the technocratic paradigm to the humanistic paradigm. Currently, we live in times of paradigmatic transition. Among other things, in this transition, the changes are influencing the

way we understand health care and how we understand the training of professionals who provide health care.²⁵ This statement arises because of a seemingly arbitrary element, i.e., a predictable experiment in a particular historical moment that consolidates the existing paradigm.²

To illustrate Kuhn's statement, we can use the example of the emergence of Childbirth Centers in 2004. These facilities were considered the symbolic representation of a set of ideas guided by an own paradigm—in this case the humanistic paradigm of childbirth care—different from the technocratic paradigm that recommended the hospital as the ideal place to give birth.²⁶ For these reasons, when a new paradigm replaces an old one, what Kuhn calls a scientific revolution occurs, i.e., non-cumulative development episodes take place, in which an older paradigm is completely or partially replaced by a new paradigm that is incompatible with the previous one.² Therefore, why do we affirm that a paradigm shift is a revolution? It is because when paradigms change, the world itself changes along.⁴ Scientists adopt new instruments and guide their looking toward new directions.^{12,22} Replacing a paradigm for another one implies discontinuity.¹

Proponents of competing paradigms perform their activities in different worlds. As they carry out their professions in different worlds, both groups of scientists see different things when they look from the same point to the same direction. Both groups look at the world and what they look at has not changed.^{2,4,12,27} However, in some areas, they see different things, which are viewed by keeping different relationships between them. That is why a law, which cannot be demonstrated to one group, can occasionally seem intuitively obvious to another.^{12,23,27}

The transition between competing paradigms cannot be made step by step, by imposition of logic and neutral experiences; it must occur suddenly or it will never occur.^{2,23,25} However, they do not often achieve general acceptance and, sometimes, a generation is required so that the change takes place.² Some conversions will occur at a time until the last opponents disappear and all members of a particular profession are guided by a single—but now different—paradigm.

Deciding to reject a paradigm is always deciding to accept another simultaneously.⁴ Certain sciences fail to dialogue, for example, biology and psychology. The difficulty comes from the difference in the way of seeing the

world and, consequently, the difference in the way of carrying out science. Therefore, we must consider the incommensurability of science.²

Incommensurability is responsible for the proliferation of new specialties and specialization ends up being the promoter of scientific progress. For Kuhn, progress occurs from what we want to know and not towards what we should know.² In this sense, specialized research is the indispensable prerequisite so that there could be deepening of the knowledge of certain facts of nature.¹ Specialization is an exclusive product of scientific communities, which are marked by homogeneity of research and it can be exemplified by holding thematic conferences, publication of journals, and creation of centers.¹

♦ Non-invasive caring technologies: cleaning procedures of the humanistic paradigm

The scientific revolution that generated the humanistic paradigm relied on a public policy that inserted the obstetric nurse for the reconfiguration of health care provided to women.⁸ The next step was the implementation of the process of demedicalization,^{8,16,24} which means offering women the right to choose.^{3,7}

Obstetric nursing has had a considerably important scientific production related to this issue and this fact reflects the active participation of this professional group in the proposition of cleaning procedures. This participation can be illustrated by the development of the concept of non-invasive technologies in obstetric nursing. This fact is a landmark in the humanistic paradigm of Brazilian obstetric nursing and it contributes at such an extent that this category can start the scientific revolution.^{17-18,24,26,28} Non-invasive health care technologies involve caring, practice and procedure, in addition to the fundamental characteristic of non-invasion of the body, mind and the privacy of being.^{16,18} These aspects are called non-invasive because they offer women the right of using them or not.¹⁷

In order to develop non-invasive technologies, it is necessary to incorporate the inner layout of demedicalization as an attitude to promote humanization. In this context, demedicalization implies that professionals should allow themselves to adopt attitudes that refute or question the dogmas of technocratic health care and thus free themselves from truths imposed by the scientific rationale. Thus, the demedicalized

attitude constitutes a basic instrument for the development of non-invasive technologies and, consequently, humanization.¹⁶

CONCLUSION

Questioning old paradigms and replacing them by others imply the reconstruction of our commitments with respect to some common assumptions. Knowing the value that we attach to human and technological aspects, the weight of intuitive and rational issues in our decisions, the sense of our partnerships, the sense of choosing a type of population and a model of health care is to recognize the paradigms by which we are guided. Clarity about what we have selected and what we excluded in these choices help us understand what types of solutions are parts of our history in obstetric nursing.

The scientific revolution promotes the formulation of new propositions in order, not only to change the reality from a new worldview, but also to change values attached to health, disease and health care. This change of values also modifies the insertion of the social actors involved in a given scenario, i.e., childbirth care. In this way, health professionals, users and the society have been given a new context of demand.

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