

THE MATERNITY STRUCTURE AS A MATERNAL SAFETY INDICATOR<sup>1</sup>

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## ABSTRACT

**Objective:** to evaluate the structure of five maternity wards of the *Rede Mãe Paranaense* program in the municipalities of the 17<sup>th</sup> Health Regional of the State of Paraná. **Method:** a cross-sectional, descriptive, evaluation study carried out in four maternities-references for habitual and intermediate risk and one for high risk. Data collection took place from July 2017 to January 2018, through an interview with a structured questionnaire to the nursing heads and an observation script by the researcher. The data were analyzed according to Resolution 36/2008 of the Ministry of Health. **Results:** the presence of a reception room (40%), admission examination room (40%) and pre-delivery/delivery/post-childbirth room (80%). In the specialties, ultrasound (60%), echocardiography (60%), radiology (80%), clinical laboratory (80%) and human milk bank (40%) were found. Regarding emergency supplies, 100% of the services had such resources, however, 60% had a cardiac monitor and defibrillator. It was observed that more than 50% of the services did not offer training to professionals in the previous year. In 60% of the institutions the assistance protocols were available, but outdated. **Conclusions:** there is a need for improvement in the physical structure of maternities, training of human resources, and elaboration and updating of assistance protocols, aiming at maternal safety.

**Keywords:** Structure of services. Maternal-Child health services. Health evaluation. Maternal health. Patient safety.

## INTRODUCTION

Patient safety is the latest component dimension of the concept of quality of care, which allows us to infer that the promotion of quality in care is directly related to patient safety<sup>(1)</sup>.

The quality science depends on meaningful and quantifiable measurements, just like any other; therefore, all the factors considered as care risks should be controlled and analyzed for the improvement of maternity safety<sup>(2)</sup>.

Donabedian, one of the pioneer authors of health care quality, proposes the use of the classic triad: structure, process and outcome for the evaluation of the care process. For this study, aspects related to the structure were considered, which includes the conditions under which care is provided, represented by the physical structure, material resources, equipment and human resources (multidisciplinarity, professional qualification, teaching and research activity, availability of clinical protocols and performance evaluation tools)<sup>(3)</sup>.

The maternities have particular

characteristics, since they provide care to women who experience physiological processes but who may suffer complications, requiring emergency care that requires adequate physical structure, material and human resources to assist the mother-child binomial and ensure maternal safety<sup>(4)</sup>.

In this sense, obstetrical services with adequate structures should contribute to quality and safe care for women and children. However, it cannot be said that there is a direct relationship between a good structure and qualified care delivery; however, it is assumed that an inadequate structure may impair the patient's quality of care and safety<sup>(5,6)</sup>.

Thus, considering that the promotion of adequate structures conditions plays an important role in the production of obstetric care, it is hoped, with this study, to raise the potentialities and fragilities related to the structures of the maternity hospitals studied. With this action, it is intended to encourage investments in the organization and structuring of services and provide quality and safe maternal care.

<sup>1</sup>Research article, extracted from the master's dissertation, entitled: "Mãe Paranaense Network: the maternal during delivery", by the State University of Londrina.

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Thus, this study aimed at evaluating the structure of five maternity wards of the *Rede Mãe Paranaense* program in the municipalities of the 17<sup>th</sup> Health Regional (RS) of the State of Paraná.

## METHOD

This is a cross-sectional, descriptive, evaluation study carried out in the 17<sup>th</sup> Health Regional that has 21 municipalities located in the northern region of the State of Paraná<sup>(7)</sup>. These municipalities have a total of 11 referrals for delivery. This study included those who offer care through the Unified Health System (SUS), four maternities-referrals for childbirth at usual and intermediate risk and one for high risk, totaling five institutions.

The risk stratification of the pregnant woman defines her linking to the place of birth, according to the *Rede Mãe Paranaense* program. Women who do not have individual risk factors (race and ethnicity), sociodemographic (education), history of diseases or grievances and reproductive history are considered to have a normal risk; as those with intermediate risk, those presenting individual risk factors, sociodemographic and previous reproductive history of fetal death, and those with high risk classification present pre-gestational diseases or clinical intercurrents in the current gestation (placenta previa, gestational diabetes, hypertensive syndrome, among others<sup>(7)</sup>).

Obstetric beds for usual and intermediate risk add up to 42 and are not intended for adult or neonatal intensive care. For high-risk childbirth, 17 beds are joint accommodation, 10 beds of adult intensive care unit (ICU), 13 beds of neonatal ICU and 14 beds of neonatal intermediate care.

Data collection was performed between July 2017 and January 2018, through an interview and direct observation. The interview was done with a structured form, applied to the head of nursing of each service, in a single visit previously scheduled. The form was structured with questions about the characterization of hospitals and the “Structure” element of the Donabedian Triad, including the physical structure, materials, equipment and human resources (multidisciplinarity, professional

qualification, teaching and research activity, availability of clinical protocols and performance evaluation).

The direct observation was made through a technical visit of one of the researchers in order to observe if the report obtained in the interview with the head of nursing reflected the reality of the maternities. The route of observation of the places of birth included characteristics of physical structure, as well as the availability of materials and equipment needed for obstetric care.

The two tools were prepared in accordance with the recommendations on the structure of the Obstetric and Neonatal Care Services, as required by the Resolution of the Collegiate Board of Directors - RDC 36/2008<sup>(8)</sup> of the Ministry of Health (MS). Considering this Resolution, service must have the resources related to the physical structure, materials, equipment and human resources according to their complexity, which is defined by the normal delivery assistance with and without dystocia and surgical delivery. It should be noted that the services that participated in the study have the same specificities of attending natural and surgical delivery.

The data were compiled in the Statistical Package for Social Sciences (SPSS), version 22.0. The descriptive analysis of the data with absolute and relative frequency distribution of the variables was used. Adequate and safe places for maternal health were those that met the elements of physical structures, equipment, materials and human resources recommended by the Ministry of Health<sup>(8)</sup>.

This study respected the ethical precepts, obtained authorization from the five maternity hospitals and accepted the participants through the Informed Consent Form (TCLE). It was approved by the Research Ethics Committee of the State University of Londrina-PR, under the opinion No. 2,053,304.

## RESULTS

The results observed in relation to the presence of physical structure requirements in the studied maternity hospitals are distributed in Table 1 according to the items recommended by the Ministry of Health.

**Table 1.** Distribution of obstetric services, according to requirements of physical structure, material resources and equipment, Paraná, Brazil, 2017-2018

| Physical infrastructure                                     | Yes |       | No |       |
|---|-----|-------|----|-------|
| Availability  | n   | %     | n  | %     |
| Parturient and accompanying host room                       | 2   | 40.0  | 3  | 60.0  |
| Parturient examination and admission room                   | 2   | 40.0  | 3  | 60.0  |
| Living and meeting room for companions, visitors and family | --  | --    | 5  | 100.0 |
| Exclusive toilets for visitors/companions                   | 1   | 20.0  | 4  | 80.0  |
| Pre-birth/delivery/postpartum room (PPP)                    | 4   | 80.0  | 1  | 20.0  |
| Room/joint accommodation ward                               | 5   | 100.0 | -- | --    |
| <b>Pre-birth/delivery/postpartum room</b>                   |     |       |    |       |
| Sink for hand washing                                       | 3   | 60.0  | 2  | 40.0  |
| Oxygen points   | 4   | 80.0  | 1  | 20.0  |
| Bathub  | --  | --    | 5  | 100.0 |
| Fixed bar or ling ladder in the bathroom                    | 1   | 20.0  | 4  | 80.0  |
| Exclusive bathroom  | 3   | 60.0  | 2  | 40.0  |
| <b>Room/joint accommodation ward</b>                        |     |       |    |       |
| Exclusive bathroom  | 3   | 60.0  | 2  | 40.0  |
| Sink for hand washing                                       | 3   | 60.0  | 2  | 40.0  |
| Counter with washbasin for hygienic care of lactating woman | 1   | 20.0  | 4  | 80.0  |

As for specialized care services available within the maternity units, the offer of ultrasound (60%), Doppler ultrasonography (80%), echocardiography (60%), radiology (80%), clinical laboratory (80%), hemotherapy (40%) and a human milk bank (40%). The other services did not offer the resources described above.

The availability of hospital beds (100%), cribs for each maternal bed (80%), table for gynecological examination (100%), bedside table for each bed (60%) and armchairs for the family to stay with the woman and the newborn (20%). Regarding the specific materials for the assistance during normal and surgical delivery, the maternity hospitals included all of them, according to current legislation. Regarding emergency materials for maternal resuscitation, all maternity facilities were equipped with such resources (emergency medicine, complete laryngoscope, complete manual resuscitator, masks, endotracheal tubes, cannula and guidewire).

All maternity wards had equipment such as pulse oximeter, infusion pump, sonar, cardiotocographs, amnioscopes. However, 60% had emergency equipment for cardiac monitoring and defibrillation to attend to cases of maternal emergencies. It was identified that maternity reference for high risk has the

equipment for emergency incidents.

Data regarding the physical structure, material resources and equipment obtained through the observation script did not differ from the results found in the interview with the nursing heads of the services.

In the findings related to human resources, it was observed that 40% of the maternities had multidisciplinary teams composed of physicians, nurses, psychologists, social workers, physiotherapists and speech therapists, highlighting the high-risk maternity that had all these professionals.

The presence of physicians and nursing professionals was observed in all maternity wards, most of whom were specialists in their area of practice. However, nursing managers reported deficits in the numbers of these professionals. Teaching activity was also observed, undergraduate students and multiprofessional residency in 40% of the maternity hospitals, one of them being considered a reference for habitual the intermediate risk and another, a reference for high risk.

It was found that 40% of the services used tools to evaluate the performance of the professionals and, of this total, 20% effectively worked with indicators to assess the quality of care represented by the reference maternity for

high risk childbirth.

Another aspect evaluated was that slightly more than half (60%) of the maternity hospitals investigated had clinical-obstetric protocols available, but 66% of them were outdated. In addition, the professionals interviewed were not able to report which were available for consultation and for the orientation of the work team.

Regarding to continuing education in the service, it was evidenced that less than 50% of the maternity hospitals offered training to health professionals in the last year, and the training on the ten steps of breastfeeding (BF) was the most cited among the nurses, although 60% of them are not communicated periodically to the team.

## DISCUSSION

Considering that in the current scientific scenario there are limited specific publications on the structure of maternity hospitals, it is of great importance to elaborate new studies on the subject, since this structure can contribute to the quality and safety of the care provided during hospitalization for the childbirth. Thus, in this study, the innovation of the relationship between the structure of maternity units and maternal safety stands out.

The maternities are unique health organizations that accommodate at the same time two people who do not necessarily present illness, generating great expectation for positive results that involve emotional, social and cultural factors of the patients and their families, reinforcing the importance of the evaluation of the resources of structure, for the production of safe care for this population<sup>(9)</sup>.

In Brazil, the concern with the resources of the structure deserves attention due to the insufficient supply of professionals and adequate environments for the health care of the population, as well as the difficulty in accessing obstetric care and indirect costs related to the places of birth<sup>(10)</sup>.

The results presented in this study showed, in a varied way, (in)adequacies regarding the physical structure, equipment and human resources of the studied maternities when compared to the norms recommended by the MS.

It is also important to emphasize that the

concern about the safety of places of childbirth is a social and dynamic process, inserted in a context influenced by structural, organizational and human factors that involve the whole multidisciplinary team. It should be emphasized that each professional must assume responsibility and interdependence for safe and high-quality care<sup>(11)</sup>.

In this study, it was shown that less than 50% of the maternities had adequate physical structure to care for childbirth - parturient and accompanying host room; parturient examination and admission room; living room and meeting for companions, visitors and family members, which does not comply with the recommendations in the structuring of the Maternal and Neonatal Care Services<sup>(8)</sup> and compromises the capacity to provide hosting and humanization of care, elements necessary for a safe care.

A positive result was the identification that the majority (80%) of the maternities had rooms for pre-delivery, childbirth, postpartum (PPP), as recommended by legislation, environments that provide privacy, humanization and safety in parturient care in these three stages<sup>(12)</sup>. This finding is in accordance with the normative standards established by the MS that assigns the PPP room to the humanization of care, to the mother-child bonding, to the presence of the companion, with the objective of minimizing health risk and improving patient satisfaction of woman at childbirth<sup>(8)</sup>.

It should be emphasized that maternal and neonatal care services must have a physical structure that is aligned with the care mission, the responsibilities, the level of complexity, size and degree of risk. They should also provide environments and facilities necessary for the care and the development of health risk management activities inherent to the work practice<sup>(9)</sup>.

Another important finding in this study was the provision of specialties - ultrasonography, echocardiography, hemotherapy, collection of human milk - by maternity hospitals. It is not necessary for each service to have this assistance network within its structure, but it is mandatory to guarantee access, in a timely manner, to these assistance, diagnostic and therapeutic resources, according to the service profile and assisted population<sup>(8)</sup>.

The study also pointed out that the minimum material required resources for maternal care at childbirth were available in all services, which has a positive impact on the process of childbirth care, as each maternity unit must make available materials and medicines, according to the level of care complexity and the need to care for the population<sup>(13)</sup>.

The emergency equipment needed for maternal care was found only in high complexity maternity, which represents a risk for women of habitual and intermediate risk, who may evolve to urgency and emergency situations in services of less complexity.

Similar data were found in a recent national survey<sup>(14)</sup>, in which basic equipment for attending obstetric emergencies was lacking in 40% of public hospitals without ICUs.

It is emphasized that organizations must be equipped with adequate materials and equipment, as well as qualified personnel to provide the minimum standard of care required for women and newborns, since the quality of safe maternal care depends on the availability of inputs and appropriate equipment during care during labor and delivery<sup>(15)</sup>.

Research carried out in other maternity hospitals in Brazil showed deficiencies in the availability of resources for supplies and equipment, training of human resources and the presence of ICU, affirming that there is a compromise in the quality of health institutions for safe care during delivery and birth care<sup>(6)</sup>.

When analyzing the human resources involved in childbirth care, we verified the absence of multiprofessional staff in the reference maternity hospitals for habitual and intermediate risk. It was also observed that almost all medical and nursing professionals were experts in their field, a panorama that suggests the attribution of knowledge and the updating of these professionals, favoring the quality of care.

Similar results were found in another study<sup>(5)</sup>, in which the authors identified physicians and nurses in the majority of the maternity hospitals under study and showed the association between the offer of professionals and the appropriate environments for safe care of women and the occurrence of favorable results, which makes it essential to assess all aspects of the structure of

obstetric services.

Another interesting aspect identified was the performance evaluation of workers in half of health organizations; considering the importance for the development and professional improvement, the periodic evaluations should be encouraged by the managers. In this sense, the quality of care depends on the motivation and qualification of the professional and on the adequate resources available for this work<sup>(15)</sup>.

In this way, it is up to human resources to adopt humanization measures, training and elaboration of institutional protocols. In addition, obstetrical services are responsible for guaranteeing permanent education for workers to promote, prevent and minimize risks of unfavorable maternal outcomes<sup>(8)</sup>.

The findings of this study showed that the achievement of permanent education in maternity hospitals was less than expected, since in a significant number of them there was a lack of development of periodic training for employees, whereas opposite data were found in the maternity reference for high risk, which conducts teaching and research activities.

Similar results were found in a survey<sup>(5)</sup> which revealed that less than 40% of the professionals participated in the training offered by the service in the previous year and that the topic most approached in the training was to encourage breastfeeding.

This scenario is worrisome within the delivery services, given the magnitude of the problem related to the lack of qualification training and the professional update that is directly reflected in the quality of care provided and in maternal safety.

According to what is recommended, the Maternal Care Service must guarantee permanent education for workers, prioritizing the control, prevention and elimination of health risks, in accordance with the assistance proposal performed<sup>(8)</sup>. It is known that actions aimed at the education, awareness and involvement of patients and their families are important approaches for the development of strategies that promote service quality and patient safety<sup>(9)</sup>.

In this context, the nurse plays a central role in the actions of permanent education in health. A recent study indicates that the implantation of a permanent education nucleus in nursing

services favors the inclusion of the educational process in the daily work, providing new knowledge and conditions for changes in health practices<sup>(16,17)</sup>.

Regarding protocols, most maternity hospitals investigated had assistance protocols based on clinical guidelines; however, were out of date due to the absence of scheduled reviews. It is worth noting that the use of clinical guidelines based on scientific evidence has been pointed out as an important tool in the effort to improve the quality of health care<sup>(6)</sup>.

The implementation of structured protocols, guidelines, packages and checklists are ways to create a framework for skills development<sup>(2)</sup>. In addition, the staff of each service must commit to establishing protocols, standards and technical routines, in accordance with current legislation and the scientific evidence of the area<sup>(9)</sup>.

In this context, a study that analyzed the checklist for safe delivery and reduction of obstetric risks with the objective of monitoring and reducing unfavorable events in childbirth care showed that, in order to achieve this goal, it is necessary the training of human resources through continuing education<sup>(18)</sup>.

An international study pointed out that after the implantation of the Safe Motherhood Initiative by the New York State Department of Health and the American Congress of Obstetricians and Gynecologists (ACOG), through the standardization of obstetric care for the diagnosis, prevention and management of the three main causes of maternal mortality and morbidity - hemorrhage, hypertension and pulmonary embolism - there was a significant improvement in maternal outcomes<sup>(19)</sup>.

It is perceived that the promotion of the quality of obstetrical services is essential for the achievement of better results in the maternal environment, which are one of the major challenges of maternity hospitals: to promote adequate conditions to favor the production of quality care and, consequently, maternal safety.

The inadequacies related to the hospital structure may compromise maternal care, both for high-risk pregnant women who may suffer from having their care impaired by hospital structure failures, as well as those with habitual and intermediate risk, who may not receive appropriate care to the natural evolution of their

delivery in a technological environment, which favors the use of unnecessary interventions<sup>(19)</sup>.

From the above, it is reiterated the need of having an adequate environment so that the parturient can give birth to their children in an environment physically prepared to meet their needs; with the necessary material resources and equipment, that professionals are trained to guarantee appropriate care, based on care protocols, associated with managers engaged in the theme of quality and patient safety<sup>(20)</sup>.

As study limitation we highlight the evaluation of reference maternity hospitals for all the municipalities that compose the 17<sup>th</sup> RS, and their results are representative of the loco-regional reality.

## CONCLUSION

In this study, maternity hospitals, overall, showed deficiencies in infrastructure, whereas services of habitual and intermediate risk presented lack of emergency equipment, a lack of multidisciplinary team, a lack of institutional clinical protocols and of human resources training.

The panorama presented shows the potentialities and challenges in aspects related to the structure of maternity hospitals. These findings intend to provide subsidies for managers to redirect actions that aim to adapt them to the guidelines established by the Ministry of Health focused on the quality of childbirth care.

Therefore, it is necessary to improve the physical structure of maternity hospitals, invest in material resources, such as the acquisition of emergency equipment, training of health professionals, expansion of availability and updating of clinical and obstetric protocols, aiming at compliance with regulations the qualification of care and patient safety in care of childbirth.

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## A ESTRUTURA DE MATERNIDADES COMO INDICADOR DE SEGURANÇA MATERNA

### RESUMO

**Objetivo:** Avaliar a estrutura de cinco maternidades do Programa Rede Mãe Paranaense nos municípios da 17ª Regional de Saúde do Estado do Paraná. **Método:** estudo transversal, descritivo, de avaliação, realizado em quatro maternidades-referências para o risco habitual e intermediário e uma para o alto risco. A coleta de dados ocorreu de julho de 2017 a janeiro de 2018, mediante entrevista com formulário estruturado às chefias de enfermagem e roteiro de observação pela pesquisadora. Os dados foram analisados conforme a Resolução 36/2008 do Ministério da Saúde. **Resultados:** observou-se a presença de sala de acolhimento (40%), sala exame de admissão (40%) e quartos de pré-parto/parto/pós-parto (80%). Nas especialidades foi constatada a oferta de ultrassonografia (60%), ecocardiografia (60%), radiologia (80%), laboratório clínico (80%) e posto de coleta de leite humano (40%). A respeito dos materiais de emergência, 100% dos serviços dispunham de tais recursos, no entanto, 60% possuíam monitor e desfibrilador cardíaco. Observou-se que mais de 50% dos serviços não ofereceram capacitação aos profissionais no ano anterior. Em 60% das instituições os protocolos assistenciais estavam disponíveis, porém desatualizados. **Conclusões:** faz-se necessária melhoria na estrutura física das maternidades, capacitação aos recursos humanos, além de elaboração e atualização de protocolos assistenciais, visando à segurança materna.

**Palavras-chave:** Estrutura dos serviços. Serviços de saúde materno-infantil. Avaliação em saúde. Saúde materna. Segurança do paciente.

## LA ESTRUCTURA DE MATERNIDADES COMO INDICADOR DE SEGURIDAD MATERNA

### RESUMEN

**Objetivo:** evaluar la estructura de cinco maternidades del Programa *Rede Mãe Paranaense* en los municipios de la 17ª Regional de Salud del Estado de Paraná. **Método:** estudio transversal, descriptivo, de evaluación, realizado en cuatro maternidades-referencias para el riesgo habitual e intermediario y una para el alto riesgo. La recolección de datos ocurrió de julio de 2017 a enero de 2018, mediante entrevista con formulario estructurado a la jefatura de enfermería y guión de observación por la investigadora. Los datos fueron analizados conforme la Resolución 36/2008 del Ministerio de la Salud. **Resultados:** se observó la presencia de sala de acogida (40%), sala examen de admisión (40%) y habitaciones de parto/parto/postparto (80%). En las especialidades fue constatada la oferta de ecografía (60%), ecocardiografía (60%), radiología (80%), laboratorio clínico (80%) y puesto de recolección de leche humana (40%). Respeto a los materiales de urgencias, 100% de los servicios contaban con tales recursos, pero, solo el 60% poseía monitor y desfibrilador cardíaco. Se observó que más de 50% de los servicios no ofrecieron capacitación a los profesionales en el año anterior. El 60% de las instituciones los protocolos asistenciales estaban disponibles, aunque desactualizados. **Conclusiones:** es necesaria la mejoría en la estructura física de las maternidades, capacitación a los recursos humanos, además de elaboración y actualización de protocolos asistenciales, teniendo por objetivo la seguridad materna.

**Palabras clave:** Estructura de los servicios. Servicios de salud materno-infantil. Evaluación en salud. Salud materna. Seguridad del paciente.

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