Original Article

Nursing follow-up: monitoring of children's health indicators in the program of family health*

Seguimento de enfermagem: monitorando indicadores infantis na saúde da família

El acompañamiento de enfermería: monitorización de indicadores infantiles en salud de la familia

Débora Falleiros de Mello[1], Débora de Miranda Barros[2], Ione Carvalho Pinto[3], Maria Cândida de Carvalho Furtado[3]

ABSTRACT

Objective: To describe children's health indicators during the first two years of their life. **Method**: This was a descriptive study. Data were collected through birth certificates and medical records of 68 children born between January 1st 2002 and December 31st 2004. The children were monitored from birth to December 31st 2006 in an outpatient health unit of the program of family health at Ribeirao Preto, SP. **Results:** The children were at risk for health problems and a significant number of their mothers were teenagers with more than 3 children. Health care provided by the program of family health consisted of an increase in the amount of prenatal care, expansion of breastfeeding support and coverage, vaccination, and foot testing. **Conclusion**: Nursing and other professionals care has been very important in improving the children's health indicators. Monitoring health indicators can promote adequate child care; particularly, among children attending a program of family health.

Keywords: Child health; Health status indicators; Pediatric nursing

RESUMO

Objetivo: Descrever os indicadores de saúde de crianças acompanhadas nos dois primeiros anos de vida em uma unidade de saúde da família. **Métodos:** Estudo descritivo. Os dados foram coletados através dos registros em declarações de nascidos vivos e prontuários de 68 crianças nascidas no período de 01/01/2002 a 31/12/2004 e acompanhadas até 31/12/2006 em uma unidade de saúde da família de Ribeirão Preto-SP. **Resultados**: A população caracterizou-se como de risco, apontando uma parcela significativa de mães adolescentes, com menos de oito anos de estudo, mais de três filhos. No tocante às práticas de saúde na unidade de saúde da família houve um incremento no número de consultas de pré-natal, ampliação da cobertura de aleitamento materno, vacinação e teste do pezinho. **Conclusão:** A prática de enfermagem e dos demais profissionais tem sido importante na melhoria dos indicadores de saúde infantil. Monitorar os indicadores possibilita fortalecer a organização da assistência à criança, particularmente no contexto da estratégia Saúde da Família.

Descritores: Saúde da criança; Indicadores de saúde; Enfermagem pediátrica

RESUMEN

Objetivos: Describir los indicadores de salud de niños acompañados en los dos primeros años de vida. **Métodos:** Estudio descriptivo. Los datos fueron recolectados a través de los registros de las declaraciones de los nacidos vivos y de fichas de 68 niños nacidos en el período de 01/01/2002 a 31/12/2004 y acompañados hasta el 31/12/2006 en una unidad de salud de la familia de Ribeirao Preto, Sao Paulo. **Resultados**: La población se caracterizó como de riesgo, apuntando una parcela significativa de madres adolescentes, con menos de 8 años de estudio y más de 3 hijos. En lo que se refiere a las prácticas de salud en la unidad de salud de la familia hubo un incremento en: el número de consultas de prenatal, la ampliación de la cobertura de amamantamiento materno, la vacunación, y, en la prueba del pie. **Conclusión:** La práctica de enfermería y de los otros profesionales ha sido importante en la mejoría de los indicadores de salud infantil. La monitorización de los indicadores posibilita fortalecer la organización de la asistencia al niño, particularmente en el contexto de la estrategia salud de la familia.

Descriptores: Salud del niño; Indicadores de salud; Enfermería pediatrica

* *Study developed at Escola de Enfermagem de Ribeirão Preto (EERP, Universidade de São Paulo (USP) - Ribeirão Preto (SP), Brazil.*

[1] *Associate Professor of the Maternal-Children Nursing Department and Public Health Department at Escola de EERP-USP - Ribeirão Preto (SP), Brazil.*

[2] *Intern Nurse in Children's Health at Universidade Estadual de Londrina – UEL Londrina (PR), Brazil.*

[3] *Ph.D., Professor at the Maternal-Children Department and Public Health Department at EERP - USP - Ribeirão Preto (SP), Brazil.*

Corresponding Author: **Débora Falleiros Mello**
Av. Bandeirantes, 3900 - Monte Alegre - Ribeirão Preto (SP), Brazil.
CEP: 14040-902. E-mail: defmello@eerp.usp.br

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INTRODUCTION

Children health care focus on following-up children's growth and development, encouraging breastfeeding, guiding children's diet, immunization and raising awareness on the most prevalent childhood diseases. These health practices are essential elements to promote adequate health conditions in childhood[1-2].

In primary health care in Brazil, children's health follows the strategy of the Family Health Program. The places where this strategy has been introduced have showed renewing experiences and an opportunity for new practices[3]. The strategy of Family Health is essential to reorganize the care model that aims to articulate the principles of universality, equity and integrality[4]. Care is centered in the family dimension, seen as part of its context, allowing for a broader understanding of the health-disease process and the needs for intervention that go beyond healing practices[5].

Together with the health team, the work of nursing can increase the access of families to the basic network of public health services, with interventions to promote, prevent, and treat, contributing to reduce social inequalities and improve quality of life of children, with a possibility to improve health indicators during childhood.

The fields of epidemiology and public health highlight the importance of studies on the variations of health indicators over a period of time to assess the health-disease process and plan health actions[6].

In the present study, the health information of interest refer to children (gender, weight at birth, type of feeding, vaccination, newborn screening, hospitalizations, medical and nursing care in the unit, weight and height control, and follow-up of children development) and to the mother (age, schooling, number of stillborn and live births in previous pregnancies, duration of pregnancy, number of prenatal appointments and type of delivery), to describe health indicators of children followed-up in the first two years of life in a unit of the family health program to help organizing nursing follow-up of children in the context of the Family Health strategy.

METHODS

Descriptive study[7] on the care provided to infants younger than 2 years old, highlighting the information of care provided in the units of family health.

The study was carried out in the city of Ribeirão Preto-SP, at Family Health Center-IV, after approval by the Research Ethics Committee from Centro de Saúde Escola-USP, process 200.04/2004. The family health center was introduced in 2001, it is part of the municipal network of public health services and serves a population of 3,620 inhabitants; most of them are young.

Data collection was based on information raised from the certificates of live births (DNV) and in charts from families with babies born from 01/01/2002 to 12/31/2004, followed-up in the unit until 12/31/2006. DNVs were obtained from a file in the family health unit. In the city of Ribeirão Preto-SP, there is a flow of health information, in which DNV is filled out in the places babies are born (hospitals and maternities), one copy of the DNV is handed to the family and the other is sent to the Municipal Health Secretariat and a third copy goes to the health unit near children's homes.

In the years 2002-2004, 135 babies were born in the area district, 68 were part of the present study, considering the following inclusion criteria: living in the area covered by the unit and be cared for in the unit for the first two years of life. Exclusion criteria were: infants whose mothers have had more than one child in the three years studied (10=14.9%); charts with data starting at two years old (1 =1.5%); stopping follow-up at the center before being two years old (33=49.3%); birth of twins (2=3%); having a health plan (11=16.4%); infant death before two years old (1=1.5%); not having the birth certificate (DNV) (9=13.4%).

A data base was built for analysis with information collected; a descriptive analysis was carried out using mean, percentage and frequencies[8]. Thus, results were organized presenting the characteristics of children and mothers studied, maternal-infant care, and health follow-up of children in primary care.

RESULTS

Characterization of infants and mothers studied

Health information was obtained from charts of 68 children and 68 mothers.

Among the 68 children studied, 28 (41.2%) were born in 2002, 30 (44.1%) in 2003, and 10 (14.7%) births occurred in 2004. As for gender, 38 (55.8%) were males, and 30 (44.2%) were females.

As for maternal age at the time babies were born, minimum age found in a total of 68 mothers decreased, going from 17 years old (2002), to 15 (2003), and 14 (2004). Maximum maternal age also decreased from 37 in 2002 to 33 in 2003, and 30 in 2004. We have observed that 19.2% of mothers were in the risk age group (below 18 years old and above 35 years old), 3.0% were over 35, and 16.2% were adolescents.

Another important data was maternal education. In the study, there were 53 mothers (78%) with up to seven years of study, and 13 (19.1%) with 8 to 11 years of study. None of the mothers presented 12 years or over of study, and two certificates (2.9%) did not have

information.

Regarding the number of live births in previous pregnancies, in 2002 the maximum number of live births was 7, in 2003 this number remained the same and, in 2004, there was a decrease from 7 live births to 5. We understand that 19 mothers (27.9%) are part of the social risk of having three or more live births. As for stillborns in previous pregnancies, 6 mothers (8.82%) had a still born

Maternal-infant care

Maternal-infant care was assessed from the information on the number of prenatal appointments, type of delivery, place of delivery, pregnancy duration, weight at birth, breastfeeding, vaccines, screening test, and hospital admissions.

As for prenatal care, the study showed that 13 mothers (19.2%) had 6 prenatal appointment, and 11 of them (16.2%) had 4 to 6 appointments; 52 mothers (76.5%) had 7 appointments or over, and in 3 (4.3%) the birth certificate (DNV) did not provide this information. In 2002, 60.7% of the pregnant women had 7 prenatal appointments or over, going from 86.7% in 2003 to 90% in 2004, there was an increase in this practice in the three-year-period.

In the present study, 2 mothers (2.9%) had babies in their home, and 66 (97.1%) had them in the hospital. As for the type of delivery, 44 (64.7%) had normal vaginal delivery, one (1.5%) needed forceps, 22 (32.3%) had a C-section, and one (1.5%) DNV did not provide this information. C-sections decreased over years, they were 42.9% in 2002, 26.7% in 2003, and 20% in 2004, and they are below the average of C-sections for the city, which was 53.3%, in 2004(9).

Regarding pregnancy duration in weeks, the study identified 2 (2.9%) children born preterm (32-36wks); 60 (88.2%) born at term (37-41wks); 4 (6%) post-term children (42wks or over) and 2 (2.9%) with no information. In 2002, 3.6% of the children were classified as premature, decreasing to 3.3% in 2003, and 0% in 2004, demonstrating a reduction in the three-year-period.

As for weight at birth, 60 (88.2%) of the children were within the normality range (2500g to 3999g), 2 (2.0%) were overweight, and 6 (8.9%) presented low birth weight (between 1500g and 2499g). The number of children with low birth weight decreased over time, it was 4 (14.3%) in 2002, 2 (6.7%) in 2003 and zero in 2004. There were no babies with weight lower than 1500g in the sample.

We have used the data for exclusive breastfeeding (AME) in the present study to assess breastfeeding until four months of age, even though we knew that WHO guidelines are until six months old. In infants assessed, 24 (35.3%) received only breastfeeding, 30 (44%) received mixed feeding, 11 (16.3%) received infant formula and in 3 charts (4.4%) this information was not provided. When exclusive breastfeeding was compared to predominant feeding, we saw an increase from 53.5% in infants born in 2002 to 60% in those born in 2003 and 2004. As for continuation of breastfeeding, 44 children (64.7%) continue to receive breastfeeding, 22 (32.3%) until 12 months old, and 22 (31%) until 24 months old; 19 (28%) did not continue with breastfeeding after four months and 5 (7.3%) charts did not present this information.

As for vaccines, 60 infants (88.2%) had their basic vaccine scheme updated, 6 (8.9%) had them delayed, and 2 (2.9%) charts did not have this information. We have observed that the number of children with delayed basic vaccine scheme (up to one year old) decreased over years, there were 5 infants (17.9%) born in 2002, 1 (3.3%) born in 2003, and none born in 2004, demonstrating an increase in complete vaccination during childhood in the period assessed.

Another data raised was recording the screening test on the chart, 61 infants (89.7%) performed the test, and 7 charts (10.3%) did not provide this information. Among the children born in 2002, 75% of the charts contained this data, and in 2003 and 2004 this amount was 100%, showing a good coverage of this practice in the period.

In the present study, we have found records referring to hospital admissions due to diarrhea, respiratory, ear and skin problems, malnutrition/anemia, urinary tract infection and neonatal jaundice on infants' charts. Among the children investigated, none of them was admitted to hospital with diarrhea, skin problems, malnutrition /anemia and urinary tract infection; however, 3 children (4.4%) were admitted due to neonatal jaundice (admitted only once), and 8 children (11.8%) were admitted with respiratory and/or ear problems. There was a decrease in admissions due to respiratory problems with 6 cases (21.4%) in 2002, 1 (3.3%) in 2003 and 1 (10%) in 2004, 1 infant (1.5%) was admitted to hospital twice because of this problem (Tables 1 and 2).

Infant health follow-up in primary care

Infants' health follow up in the family health center was assessed according to the number of care provided by nurses and physicians in the first two years of life. In the care provided, we highlighted the following variables: number of planned and casual medical and nursing appointments, number of times anthropometric measures were obtained from infants and if their growth was being followed.

We have observed that 68 infants (100%) had their medical appointments planned. For the casual medical appointment, only the mother of one infant (1.5%) did not request this service and the maximal and minimum

Table 1 – Characterization of children and mothers seen at the Family Health Center-IV, from 2002 to 2004, Ribeirão Preto, SP.

Characteristics	2002		2003		2004	
	n	%	n	%	n	%
Number of births	28	41.2	30	44.1	10	14.7
07 or more prenatal appointments	17	60.7	26	86.7	9	90.0
Low birth weight	4	14.3	2	6.7	0	0.0
Adolescent mothers	2	7.1	7	23.3	2	20.0
Number of C-sections	12	42.9	8	26.7	2	20.0
Sole or predominant breastfeeding up to 4 months	15	53.5	18	60.0	6	60.0
Late basic vaccine scheme	5	17.9	1	3.3	0	0.0
Record of screening test on charts	21	75.0	30	100.0	10	100.0
Programmed medical appointments	28	100.0	30	100.0	10	100.0
Nursing appointments	22	78.6	30	100.0	10	100.0

Table 2: Distribution of children with risk factors for children's mortality seen at the Family Health Center-IV, from 2002 to 2004, Ribeirão Preto, SP.

Risk factors	n	%
Maternal age at children's birth	13	19.2
Maternal age lower than 19 years old	11	16.2
Mother with less than 8 years of study	53	78.0
Mothers with 3 or more children	19	27.9
Low birth weight	6	8.9
Gestational age < 36wks and 6days	2	2.9

number of appointments ranged from 1 to 21 in 2002, 2 to 39 in 2003, and 1 to 27 in 2004.

As for planned nursing appointments, 62 infants (91.2%) were seen. In 2002, 78.6% of the infants were followed up by nurses and, in 2003 and 2004 this follow-up went to 100%, demonstrating an increase in this practice. Eighteen infants (26.5%) had a casual nursing appointment, 1 appointment per child in 2002, 1 to 3 appointments in 2003 and 1 to 2 appointments in 2004. There was proper coverage of nursing appointments for infants' health follow-up in the first two years of their lives.

In medical and nursing care, all children were controlled for weight and height and monitored for their growth. Only 1 chart (1.5%), in 2002, did not record height and development follow-up.

DISCUSSION

Knowing the characteristics of individuals or groups is important to organize care and to visualize risk factors associated to an increased probability of developing or being exposed to health hazards. The presence of risk factor does not mean an illness but rather, it indicates those with greater likelihood of getting ill[10].

In all care model or strategy, such as the Family Health, a relevant issue in the introduction of the program is the process of monitoring and assessing, as well as the context of introduction and the more general characteristics of the socioeconomic field and public policies[11].

Regarding health conditions during childhood, maternal education is an important aspect, associated with a more or less efficient use of the family income, the public services available, and the possibilities of employment and salary[12]. Less than eight years of maternal study is considered as a risk factor for children's mortality together with the variables of prenatal care, and living in a risk area[2]. Level of education can have influence in determining growth because it is directly related with a better understanding of children care practices[13]. A study[14] found a strong association between maternal education and children's mortality, hospital admissions and anthropometric indicators (weight/age and height/age) of children up to 20 months old. As for the number of live births, it was equal to or higher than three, and stillborns were equal to or higher than one, this is considered one of the social risk factors for children mortality, together with the variables maternal age lower than 19, mothers with less than eight years of study, with no prenatal

follow-up, or number of appointments lower than or equal to three, and delivery outside the hospital[2]. Family size and low income families with too many kids have been highlighted by international institutions such as the Food and Agriculture Organization of the United Nations, and the United Nations for Developing People, as conditions associated with nutritional risk, especially in developing countries[13].

Regarding prenatal care, which is considered a planned action of primary care; six is the minimal number of prenatal care appointments in Brazil for pregnant women without risk factors[2]. Prenatal units must provide quality care, tetanus vaccine, appointments, means for family planning, and HIV/AIDS interventions[15]. A study investigating the efficiency of prenatal care in the South and Northeast of Brazil found that 97% of studied women had prenatal appointments in the last pregnancy. When the indicator with four or more appointments was assessed, coverage was about 33%, with six or more appointments it was 26%, and 20% for seven or more appointments, indicating effective loss regarding coverage when criteria become more demanding, that is, when there is greater contact between the unit and the population[16].

As for delivery, variables assessed were type of delivery and place of delivery. C-sections as well as delivery outside the hospital were considered as factors responsible for increasing maternal mortality and they may influence the overall health conditions of children. The ideal rate recommended of C-sections is around 15% to 20% for the total of the population, and the complexity of care in the health centers should be taken into account[17].

Preterm birth is considered as one of the biological factors for infant mortality, together with weight lower than 2500g at birth, Apgar in 5th minute lower than 7, and congenital malformations[2]. In the indicators of children' health, infants' weight at birth is placed as the greatest determiner of newborn odds of survival and of having a normal growth and development[13]. This indicator is closely connected with preterm birth, that is, the lower the gestational age, the lower the weight at birth. Compared to other countries such as Sweden and Norway, mean weight at birth is 3500g and the proportion of low weight is not more than 5%[18].

As for the indicator maternal breastfeeding, encouraging this practice is recommended by several strategies to decrease children morbidity and mortality. Also, early weaning is considered as a risk factor for children morbidity and mortality with direct influence in children's growth a development[19]. In developing countries, growth delay occurs usually between the fourth and sixth months of life when breastfeeding is replaced by food with low nutritional and, as a consequence, there is greater tendency to infections[13].

Immunization for all children is also part of interventions to decrease infant morbidity and mortality, together with encouraging breastfeeding, monitoring growth and development and caring for diseases that are prevalent during childhood[2]. A study[11] on the impact of the Family Health Program in cities from the Northeast of Brazil, found out that families whose mother had low education presented greater proportion of children under one year old with low vaccine coverage, therefore, these actions should be followed-up.

Screening test has been inserted in the National Program for Neonatal Screening of the Ministry of Health for early diagnoses of some diseases such as congenital hyperthyroidism, phenylketonuria and hemoglobinopathies (trait and sickle cell disease). It is recommended to all newborns after 48 hours of life up to 30 days after birth[2].

Availability and quality of care offered by health services to pregnant women, newborn and children condition evolvement of health during childhood[18]. Relationship between the lack of or poor prenatal care and intrauterine growth retard, preterm birth, and morbidity and mortality during childhood has already been demonstrated[20], it is essential to pay attention to these indicators.

Hospital admission of children is an important parameter for children's health. The profile of children's health in Brazil shows a relative proportion of death due to diseases starting in the neonate period with a difficult intervention and a high morbidity due to the so called diseases of underdeveloped countries, such as pneumonias, diarrheas and infection/malnutrition. Admissions due to respiratory problems and infectious and parasitic diseases are reported as those that can be reduced through prevention and primary health care[21]. A study[11] showed that admission of children lower than five years old is associated with socioeconomic condition of families, especially in families with low maternal education, who presented significantly greater rate of admission due to acute respiratory infection (ARI). The study mentioned also found out that in areas covered by Community Health Agents, admission rates due to ARI and diarrhea were significantly lower.

The strategy of Integrated Care to Prevalent Childhood Illnesses approaches the main health problems of children in a systematic way in the context of family, prevention, treatment, and health follow-up to ensure an important impact on children's health by dealing with the main causes of mortality. It combines care to prevalent illnesses with healing, preventive and surveillance actions, and those actions promoting health with a new approach to communication with families, fostering attention, listening, and the singularities of the life context of each family[22]. During children's follow-up, this strategy can be implemented together with the guidelines of the Family Health Program which has occurred in this health unit

through actions to shelter children in casual care and in nursing appointments.

Health and nursing practices in children's follow-up in the context of families is a broad and continuous process and in addition to technical references, they imply promotional, preventive, therapeutic, and interaction measures with children, the family, the community, the health services, and other social sectors[23].

The strategy of Family Health in health development of children has focused on health surveillance, as demonstrated by a study carried out in Sobral-CE[3], which shows improvement of breastfeeding and immunization and reduction in admissions and hospital death due to malnutrition, respiratory diseases, diarrhea and deaths at home. In the present study, the improvement in indicators was associated with integrated and humanized care and prevention of prevalent diseases with decrease in mortality in the first year of life.

Child care is also placed as a programmed action of primary health care in Brazil, in agreement with the strategy of family health. A study[16] carried out in the South and Northeast of Brazil showed that childcare was more commonly used and offered as a basis in protocols in family health units than in traditional health units.

In children care there is correlation between children's health and some socioeconomic indicators, but there are considerations on other relevant variables to children, because they are very connected with the mother and depend on them to survive. The aspect of overall life conditions, food, housing, sanitation, access to healthcare, level of education, and family income must contemplate the life style of mothers, characterized as a series of behavioral aspects of a sociocultural nature[24].

All these elements are relevant to the nursing practice in care management and demand that professionals know individuals' context of life.

FINAL CONSIDERATIONS

In the present study, the population is at risk, there is a significant number of teen mothers, with less than eight years of study, more than three children, and children with low birth weight.

As for health practices conducted at the family health unit, there was increase in the number of prenatal care, decrease in C-sections, and increase in breastfeeding, vaccination and screening test, in the period assessed.

Some information was not recorded on the charts; there were gaps in care and limits to perform data analysis studies. Another aspect to be highlighted is that studies on variations of health indicators require longer periods with analysis of trends and temporal series.

Preventive care, such as growth and development control, care to children's disease, food, vaccination, and maternal data are important aspects to foster good health conditions in childhood. Care provided in family health units has been important to improve children's health indicators, the bond with families and the community, and to improve health practices.

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