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Assessment of the way in which entries are filled out in Child Health Records and the quality of the entries according to the type of health services received by the child

Leonardo de Paula Amorim [1]
Maria Inês Barreiros Senna [1]
Anna Rachel dos Santos Soares [1]
Gisele Teixeira Nascimento Carneiro [1]
Efigênia Ferreira e Ferreira [1]
Mara Vasconcelos [1]
Patrícia Maria Pereira Zarzar [1]
Raquel Conceição Ferreira [1]

Abstract *The scope of this study was to assess the way Child Health Records (CHRs) are filled out and the association between the quality of entries and type of service used to monitor the health of children. It involved a cross-sectional study with a stratified sample – proportional for the nine Health Districts of Belo Horizonte, State of Minas Gerais – of 3- to 5-year-old children selected on Child Vaccination Campaign Day in 2014. Interviews with parents including observation of the 21 CHR items were conducted. The dependent variable was defined by the quality of the CHR entry (satisfactory/unsatisfactory), where satisfactory entries were > 60%. The independent variables were the type of service for monitoring child health, demographic and health conditions of the mother and child and healthcare treatment received by the child, with the participation of 367 (96.10%) parents. The prevalence of unsatisfactory entries was 55.5%. No significant association was found between quality of entry and type of healthcare. Unsatisfactory entries were associated with gestational age < 37 weeks, lack of access to information about the CHR and the absence of parental entries on the CHR. The CHR has been unsatisfactorily employed as a tool for monitoring health, irrespective of the type of service used by the child.*

Key words *Public health surveillance, Child health, Primary healthcare*

[1] Departamento de Odontologia Social e Preventiva. Universidade Federal de Minas Gerais. Av. Antônio Carlos 6627, Pampulha. 31270-901 Belo Horizonte MG Brasil. leo180381@gmail.com

Introduction

Instruments for recording information on child health have been used for many years in various countries and seek to foster greater involvement of the families in child growth and development[1,2]. Few studies have assessed the effectiveness of the use of such instruments in monitoring the health of the child and there is no scientific evidence that use thereof is associated with improvements in health indicators and in access to health services, with the exception of improved rates of vaccination[3,4]. The implications of use of the recording instruments are beyond the scope of individual healthcare of the child and should be considered as a strategy in the context of information policies on health[4].

In Brazil, the Child Health Record (CHR) is the tool recommended by the Ministry of Health since 2005, which aims to monitor the health, growth and development of children up to 10 years of age, with the potential to foster dialogue between the family and the health professionals[5]. The current version of the CHR is organized into two parts, namely one for family and one for health professionals. Data on pregnancy, childbirth and postpartum and data on the newborn are items to be filled out by health professionals at the hospital. Data on child monitoring are items to be completed by the health professionals in the healthcare services frequented by the child[5].

The CHR has been assessed since its implementation, with a predominance of cross-sectional studies seeking to quantify the frequency of entries recorded in the CHR, by means of direct observation of the record per se[7-12]. Some studies, adopting an analytical approach, evaluated the quality of the entries recorded as a dependent variable[6,7,9,11]. In these studies, this variable was defined by the minimum percentage of entries duly filled out that are considered essential for monitoring child development[7], the joint completion of all the information relating to the identification, growth, development and vaccination[9] or adequate recording of the growth and development curve[6,11].

As a general rule, the studies revealed failings in the way the CHR is filled out, which would indicate that the instrument has not achieved its goals. The results revealed a consensus on the entries most often completed regarding the identity of the mother and child, including vaccination and birth weight or weight marked on the chart[6-8]. With respect to the quality of information recorded, 31.8% of CHRs showed less than 60% of entries for 20 essential items for monitoring child development[8]. In a study conducted in the state of Piauí, the combined entries for identity, growth and development and vaccination was observed in 22.2% of CHRs[9]. The filling out of development and growth entries was incomplete in 95.4% and 79.6% of CHRs, respectively[11].

Earlier studies have shown that a low level of maternal schooling was associated with poorer quality of information recorded[7,9] and the lowest number of entries for the development curve[6]. Lower income and the fact of the mother working away from home were associated with unsatisfactory entries for the growth curve[6]. The lower age of the child was associated with better quality in entries recorded for the essential items of the CHR[7] and the growth[6,11] and development charts[6]. The CHRs of first-time mothers contained more entries for the development curve in Feira de Santana[6], whereas in Mato Grosso the highest indices of completion of development data on CHRs was observed when mothers had two or more children[11]. Variables related to child healthcare were also investigated. When the general practitioner did not participate in the treatment of children in Primary Health Care there was a higher incidence of unsatisfactory completion of essential CHR entries[7]. When the child pediatric visits involved childcare services, there was a higher frequency of some weight record in the weight curve recorded on child cards (the predecessor of the CHR)[12] The essential items of CHRs were filled out more adequately when mothers received information about CHRs during maternity care[7].

The CHR is distributed free of charge to all children born in Brazil and given to the families while in the maternity ward, whereby they are held responsible for presenting the document whenever the child subsequently requires healthcare. Moreover, it is one of the elements recommended in prevailing public health policies involving comprehensive healthcare of children, including the Brazilian Primary Care Policy (PNAB)[13]. In the Primary Care Handbooks of the Ministry of Health it is stated that "the use and posting of adequate entries in the Child Health Record are fundamental for recording the salient health information for the child (Child Health Record – Citizenship Passport/MS, 2011)[14]. As a result, it is expected that the CHR will prove to be an effective surveillance tool, especially in the context of public health services. Earlier analytical studies did not assess the effect of the type of service on the quality of information entered

in the CHR[7-9]. The evaluation of the effect of the type of service used by parents to monitor the health of their children based on the quality of information may contribute to the understanding of the practices of health professionals in public or private service regarding use of the CHR, paving the way for new guidelines that favor its use in the child healthcare network. The results of this study may contribute to the discussion on the use of information recording tools on the child's health in international contexts where tools of this nature are not used or have already been used, thus contributing to acknowledgement and promotion of the debate on this important issue in the public health area.

In this context, the hypothesis tested in this study was that entries recorded in the CHR are of enhanced quality for children whose mothers reported using the public service for monitoring the health of their children. This study sought to assess the association between quality of information on the CHR and the type of service used by parents for monitoring to the health of children.

Methods

This is an analytical, cross-sectional study conducted with three- to five-year-old children in the city of Belo Horizonte with copies of CHRs distributed from the 6th edition (2009) onwards. Belo Horizonte is the capital of Minas Gerais, located in the southeast of Brazil, which had a high Human Development Index of 0.810 in 2010[15]. The projection of the local population for 2014 was 2,491,109 inhabitants[16] and the number of live births in 2014, according to the place of mother's residence, was 31,627[17]. In 2013, the municipality had 147 Primary Health Units (UBS), 509 Family Health Teams and 261 Oral Health Teams distributed among the nine health districts which coincide geographically with the nine administrative regions.

Population and sample

The calculation of sample size was conducted using the formula of estimation by proportion, by taking into consideration the prevalence of satisfactory completion of the CHR (60% or more of CHR entries filled out) of 70% observed in an earlier study[7], with a 95% confidence and 5% error level. Adjustment was performed for finite population, represented by the number of children aged three to five years living in Belo Horizonte (total of 81,145 children). The required sample was estimated at 317 children which, increased by 20% to compensate for losses, resulted in the need for 382 participants. The sample was stratified and proportional to the number of children aged three to five years in each of the nine Health Districts of the Municipal City Hall of Belo Horizonte (PBH).

Variables of the study

The dependent variable was the quality of entries in the CHR, based on the sum of the number of entries completed. For this, 21 CHR entries were observed based on the system proposed by Alves et al.[7], which included 20 items of the 5th version of the CHR considered essential for monitoring the child's health and defined as the minimum necessary to be filled out. In this study, 19 of these 20 items were evaluated, since one was excluded from the 6th version of the CHR – with two additional items for oral health – itemized as follows: name of child; date of birth; name of mother; birth weight; birth length; head circumference at birth; Apgar at the 5th minute after birth; type of delivery; date of commencement of trimester of prenatal care; number of prenatal appointments; gestational age of the child; type of infant feeding upon hospital discharge; head circumference at birth marked on the chart; age at which the last point of head circumference was marked on the chart; birth weight marked on the chart; age at which the last weight point was marked on the chart; annotation on neuro-psychomotor development; record of use of iron supplement; record of vaccinations, emergence of teeth and dental chart. The items filled out/filled out correctly received a score of one and entries not filled out received a score of zero, with a total score of 0-21 and the higher the score the higher the number of entries recorded. The CHRs with 60% or less completed entries (≥ 12 items) were considered of unsatisfactory completion quality and those with more than 60% were considered satisfactory (≤ 13). This cutoff point was defined considering the minimum acceptable value and for having been previously used in a Brazilian study[7].

The guidelines for the Manual for Use of the CHR were taken into consideration for assessment of entries recorded[5]. The records for the first year of a child's life were considered in order to evaluate the entries for neuro-psychomotor development, age at which the last point

of head circumference was marked on the chart and age when the last weight point was marked on the chart. The maximum interval allowed for registration of weight and head circumference on the charts was three months. The entry was considered correct for the neuro-psychomotor development record when there were at least three entries and the registration of vaccines, when the calendar was complete for age or less than a month late. Verification of the vaccination status was conducted by the team in charge of vaccination[7]. In relation to the emergence of teeth, the entry of the record was assessed regardless of the number of teeth marked, since the CHR does not have a space for the registration of the dental appointment date or the child's age at the time of evaluation, rendering analysis of the quality of information impossible. The dental chart was evaluated only by its use, since the lack of a category to record healthy teeth made it impossible to establish if the dental chart was not completed or if the child did not present oral abnormalities at the time of evaluation. For the fifteen other items, the presence or absence of entries was considered though the accuracy of the records was not investigated.

The main independent variable was the type of service used by parents to monitor the health of the child (public or medical insurance/private). The other variables were related to socio-demographic characteristics and conditions of pregnancy/birth and related to the healthcare received by the child. The following aspects were assessed for the socio-demographic profile of the mother and child: mother's age at the time of the child's birth (up to 25 years, 25-40 years and 41 years or more), mother's years of schooling (1 to 8 years, 9 to 12 and $\geq$ 12 years of study), workplace (home or outside the home), per capita income and sex of the child.

The birth weight ($<$ 2500 g and $\geq$ 2500 g), parenthood (primipara or multipara) and gestational age ($<$ 37 weeks and $\geq$ 37 weeks) were the variables for evaluation of pregnancy/birth conditions. Children born with less than 2500 grams are considered low birth weight and gestational age of less than 37 weeks is defined as being premature[18].

In assessing the healthcare received by the child, in addition to the type of service used by the child, the following variables were assessed: child monitored by the general practitioner, pediatrician, nurse and dental surgeon (yes or no for each professional); access to information about the CHR (yes or no); and the presence or absence of annotations recorded by the mothers in the CHR. Access to information about the CHR and the notes of parents in the CHR were evaluated using the following questions to mothers: Was information about the CHR received in the maternity ward or elsewhere? Are there annotations recorded by the mothers or fathers in the CHR?

Fine tuning and pilot study

Prior to data collection, a pilot study was conducted in a Primary Healthcare Unit in the Belo Horizonte City Hall Municipal region for interview script testing and verification of the CHR, which led to adjustments in the instrument format. The interview and verification of the CHR were staged by trained interviewers, namely dentistry course academics from the Federal University of Minas Gerais (UFMG). Theoretical and practical training was conducted lasting 5 hours with the participation of 36 volunteers. The script to collect data and the CHR versions to be included were presented to interviewers, as well as the content and criteria for the evaluation of each item, with simulation of verification of the CHR.

Data gathering

Data were collected on November 22, 2014 during the National Child Multivaccination Campaign. For sample selection and scope, two Primary Healthcare Units were selected in each Health District among those that had the largest number of children in their areas of coverage in 2010. Children were included on the basis that they met the inclusion criteria, namely having the 6th or subsequent edition of the CHR and being three to five years of age. In this age bracket, all the deciduous teeth of children have emerged and they have no permanent teeth[19,20], bearing in mind that the oral health fields analyzed refer to the emergence of deciduous teeth and the dental chart. Two students in each Primary Healthcare Unit were responsible for data collection during the Multivaccination Campaign. Monitoring of the data collection was carried out using the *WhatsApp*® cell phone application in real time.

Statistical analysis

The database was keyboarded independently by two researchers, using Microsoft Excel® software. Epi Info version 3.2.7 was then used

to crosscheck the databases and identify inconsistencies that were corrected by consulting the original scripts. Data were subjected to descriptive analysis, and the association between the variables was tested using Pearson's chi-square test. Comparison of per capita income between the groups with satisfactory and unsatisfactory entries recorded was performed using the Mann-Whitney test. The variables associated with the quality of information with $p < 0.20$ were included in the multivariate model. Logistic regression analysis was used, whereby the variables with $p < 0.05$ remained in the final model along with those that enhanced the quality of the adjustment. The adjustment was assessed using the Hosmer-Lemeshow test. To test the power of the sample (error type β a post hoc test was performed considering the parameters observed in the gross logistic regression, the association between the quality of the CHR entry and the type of service used (OR = 1.27; Pr Y = 1βX =1 = 00:57; β= 0.05). Data analysis was performed using the Stata v.12 program. The calculation of the test of power of the sample to verify the association of interest was calculated using the G Power v. 3.1.9.2 software.

Ethical issues

The project was approved by the Ethics Committees of UFMG and Belo Horizonte City Hall. Participants were informed about the objectives and methods of research, their questions were answered and they signed an *Informed Consent Form*.

Results

A total of 382 parents were approached, 15 (3.93%) of which refused to participate in the research. Among the 367 (96.10%) CHRs observed, the majority (72.5%) of respondents were mothers. The average age was 33.75 years (SD = 6.54) and the average per capita income was R$1,422.73 (SD = R$1,277.46).

The frequency of CHRs that were filled out in a satisfactory manner was 44.5%. The completion percentage of CHR entries ranged from 0.8% (dental record) to 99.5% (child's name). There was no difference in the frequency of most of the CHR entries according to the type of service used for monitoring the health of the child. The CHRs of the children whose health is monitored by public service professionals showed a significantly higher entry rate for head circumference at birth, Apgar at the 5th minute after birth and number of prenatal visits (Table 1).

Among the CHRs classified as being filled out in a satisfactory manner, the entries for vaccinations and the name and mother of the child were fully recorded. Neuro-psychomotor and emotional development, use of iron supplements, tooth emergence record and dental chart revealed a low frequency of completion, even among those classified as being of satisfactory quality (Table 2).

Most of the mothers had 9 or more years of schooling and 70.1% worked outside the home. Among the CHRs examined, 56.9% were for male children. Most mothers reported that the children were born weighing 2500g or more (90.1%), with a gestational age of 37 or more weeks (84.5%). A little over half of the mothers were multiparous (55.1%) (Table 3). Of the variables for conditions of pregnancy/childbirth, the quality of the way the CHR was filled out was significantly associated with birth weight and gestational age in the bivariate analysis (Table 3).

With respect to healthcare treatment of the child, it is performed for the most part in the medical insurance/private service (72.3%). Children are more frequently attended and monitored by their pediatrician (97.3%). More than half of the mothers/fathers (59.6%) reported having received information about the CHR. Most CHRs had no entries recorded by the mothers (77.9%). The fact that mothers have received information about CHR in the maternity ward and the presence of their entries in the CHR were significantly associated with the quality of the entries. There was no significant association between the quality of information and the monitoring of children's health by the public or medical insurance/private service (Table 4).

In the adjusted model, there was a higher proportion of unsatisfactory quality of information in the CHR of children of mothers who had gestational age <37 weeks, when the parents were not given explanations on the CHR and in the CHRs without parental notes (Table 5).

Discussion

The results of this study indicate that the problems with filling out CHRs occurred irrespective of the type of service used by parents to monitor their children, thereby not confirming the hypothesis tested.

Table 1. Frequency of entries recorded for CHR items according to the type of service used by parents to monitor the health of the child.

Items of the CHR.	Percentage of completion in the total sample	Frequency of completion of the items of the CHR per type of service		p value
		Public service (n = 100)	Private service (n = 261)	
Name of child	99.5	100	98.8	0.283
Date of birth of child	99.2	97.0	96.2	0.709
Name of mother	96.5	100.0	98.9	0.283
Weight at birth	64.5	69.0	62.2	0.229
Length at birth	63.4	68.0	61.3	0.238
Head circumference at birth	**56.0**	**64.0**	**52.5**	**0.041**
Apgar at the 5th minute	**54.0**	**62.0**	**50.2**	**0.043**
Type of delivery	56.1	61.0	53.8	0.219
Commencement of trimester of prenatal care	38.7	35.0	39.7	0.412
Number of prenatal appointments	**35.1**	**43.0**	**31.7**	**0.043**
Gestational age of the child	54.8	60.0	52.5	0.200
Type of feeding upon discharge from hospital;	36.0	39.0	35.2	0.626
Head circumference at birth (chart)	56.0	57.0	59.8	0.632
Age last head circumference recorded on chart	51.8	49.0	52.5	0.553
Weight at birth (chart)	64.8	64.0	65.5	0.787
Age last weight recorded on chart	62.7	61.0	64.0	0.686
Neuro-psychomotor development	6.0	5.0	6.5	0.591
Record of use of iron supplement	4.6	3.0	5.4	0.502
Record of vaccinations	94.0	95.0	93.5	0.770
Chronological record of emergence of teeth	1.4	1.0	1.5	0.698
Dental chart record	0.8	0	3.0	0.282

Source: Field research, 2014.

The frequency of completion of CHRs with satisfactory quality was 44.5%, namely a result lower than that observed in 2009 in Belo Horizonte using similar methodology (68.2%)[7], suggesting a reduction in the use of this instrument nearly a decade later. In this study, only children who were being monitored in the public health system were included, and those who reported monitoring services with other types of financing were excluded. The difference observed between the two studies might be explained by the profile of the sample of the type of service used. However, there was no difference in the quality of entries between public and medical insurance/private service, though a higher incidence of head circumference at birth, Apgar score at the 5th minute after birth and number of prenatal consultations in the CHRs of children monitored by the public service were observed in the bivariate analysis. These three items are meant to be filled out in the maternity ward[5]. One limitation of this study was not to have assessed the location of birth, namely public or private maternity hospital. However, it is believed that mothers who used the public health service to monitor their children are also more likely to have given birth in public hospitals. Further studies should better understand the use of health record tools in the context of maternity hospitals and health services. The work processes in these healthcare points should be related to the quality of use of the instrument, creating quality indicators of use of the CHR consistent with its proposal for use in the network of care for pregnant women and children.

The number of prenatal appointments is an indicator of quality of care for pregnant women in the public health network. The early identification of pregnant women with the first prenatal appointment within 120 days of pregnancy and at least six prenatal appointments are among the actions that must be guaranteed by states and municipalities through units comprised in the Brazilian health system[21]. This advice contained in the Prenatal and Postpartum Technical Manual might explain the higher number of entries

Table 2. Frequency of entries recorded for CHR items classified as being of unsatisfactory quality.

Item of the CHR	Percentage of items completed among the CHRs with satisfactory quality of entries (n = 163)
Name of child	100.0
Name of mother	100.0
Record of vaccinations	100.0
Weight at birth	99.4
Length at birth	98.2
Date of birth	97.5
Type of delivery	95.7
Head circumference at birth	93.9
Gestational age	93.9
Apgar at the 5th minute after birth	92.0
Weight at birth recorded on chart	82.2
Age last weight recorded on chart	81.6
Head circumference at birth (chart)	80.4
Age when last head circumference recorded (chart)	73.0
Trimester of commencement of prenatal care	71.2
Number of prenatal appointments	66.3
Type of infant feeding upon discharge from maternity	64.4
Neuro-psychomotor development	10.4
Record of use of iron supplement	8.6
Record of teeth emergence	2.5
Dental chart	1.8

Source: Field research, 2014.

of this information by professionals in the public network. Despite more entries by the public service, the frequency of completion of this item was low given its importance, showing failure to use the CHR as a tool for monitoring child health.

The Apgar score at the 5th minute after birth is consistently associated with child mortality, since it is one of the indicators of viability for the newborn child[22]. Failure to complete this data may signify that this score was not recorded in the delivery room, suggesting a poor quality of care provided in childbirth and to the newborn child. It is possible that it was measured, but no care was taken to record it[23]. One hypothesis to explain the higher levels of entries for this indicator in public hospitals is the fact that they are most often in relation to high-risk deliveries[24]. In these high-risk delivery situations, there may be greater commitment of professionals in recording this indicator. With respect to more entries for head circumference earlier studies to clarify this association were not identified and should be the scope of future studies.

However, the differences observed in the frequency of entries for these three items, in terms of attendance in public and private services, were not maintained when considering the quality of entries for the 21 items. One explanation is that the low number of entries for these items was reflected in a minor impact on the analysis of the quality of entries per type of service. The number of prenatal appointments, for example, was not recorded in 64.9% of the CHRs. Another possible explanation was that the sample size was not sufficient to detect the association under scrutiny. The sample was estimated for prevalence study using the estimation formula for proportions. In this study, an attempt was made to investigate the association between quality of CHR entries and the type of service used to monitor the health of children. Verification of the coefficient of the post hoc test sample revealed a value of 0.72. For a sample with test coefficient of 80%, the observation of 450 CHRs would be required.

Thus, the proposed indicator enables a more generalized exploratory assessment of quality, albeit lacking the sensitivity to differentiate quality of entries item by item. Furthermore, this study did not assess the validity of the information recorded, which would make it possible to know if

Table 3. Distribution of children according to sociodemographic characteristics and conditions of pregnancy/childbirth for the total sample and for the groups with satisfactory or unsatisfactory quality of completion of the CHR and results of the bivariate analysis. 2014 (n = 367).

Variables	Total sample		Quality of entries recorded				p value **
			Satisfactory		Unsatisfactory		
	n	%	n	%	n	%	
Sociodemographic profile of the mother of the child							
Age of the mother							
Up to 25 years	88	24.2	47	53.4	41	46.6	
From 25 to 40	260	71.4	108	41.5	152	58.5	0.15
41 or more	16	4.4	7	43.8	9	56.3	
Years of schooling of the mother							
≥ 12 years	169	46.3	74	43.8	95	56.2	
9 to 12	158	43.3	69	43.7	89	56.3	0.62
1 to 8	38	10.4	19	50.0	19	50.0	
Workplace of the mother							
Home	109	29.9	52	47.7	57	52.3	0.40
Outside the home	256	70.1	110	43.0	146	57.0	
Sex of the child							
Male	209	57.1	86	41.1	123	58.9	0.13
Female	157	42.9	77	49.0	80	51.0	
Per Capita Income Average (Standard Deviation)	1419.71 (± 1277.97		1406.34 (± 1230.39)		1430.45 (± 1317.94)		0.89*
Conditions of pregnancy/childbirth							
Weight at birth							
< 2500	35	09.9	11	31.4	24	68.6	0.07
≥ 2500	320	90.1	152	47.5	168	52.5	
Parity							
Primipara	164	44.9	77	47.0	87	53.0	0.37
Multipara	201	55.1	85	42.3	76	37.8	
Gestational Age							
< 37 weeks	54	15.5	18	33.3	36	66.7	0.04
≥ 37 weeks	295	84.5	142	48.1	153	51.9	

Source: Field research, 2014. *Result of the *Mann Whitney* test; **Resulting p value of *Pearson's* Chi-square test. The variables in bold type were included in the initial model of the multiple analysis.

the records in the CHR reflect the true condition of children throughout their lives. The assessment of validity should be the scope of future investigations. Nevertheless, understanding the differentials in the quality of entries in the CHR in the most comprehensive manner may contribute to the search for strategies to enhance the use of this tool in the context of the Brazilian health services. Its potential as a surveillance and health promotion tool should also be stressed. Thus, improvement in the quality of valid data in the CHR would enable its use as a research tool.

In this respect, it was seen that the CHRs were filled out with better quality when there were notes included by mothers or fathers. This association highlights the importance of participation of the family in care of the child[1]. Those parents who reported that they included notes in the CHRs of their children are probably more interested in the instrument, seek to use it and request that the professionals complete them too. A qualitative study showed that many health professionals reported experiencing situations where a link between the mother and the instrument is established, which is demonstrated when mothers insist that data is recorded in the CHR, follow closely the entries made by professionals and discuss issues related to the topics of the CHR with the professionals[25]. On the other hand, another qualitative study revealed that health profession-

Table 4. Distribution of children according to healthcare received for the total sample and for groups with satisfactory or unsatisfactory quality of completion of the CHR and results of the bivariate analysis. 2014 (n = 367).

Variables	Total Sample		Quality of entries recorded				p value **
			Satisfactory		Unsatisfactory		
	n	%	n	%	n	%	
Healthcare received by the child							
Type of service for monitoring the child							
Public service (UBS)	100	27.7	49	49.0	51	51.0	0.298
Health insurance or private	261	72.3	112	42.9	149	57.1	
Monitoring of the child by the general physician							
Yes	51	14.2	24	47.1	27	52.9	0.699
No	308	85.8	136	44.2	172	55.8	
Monitoring of the child by the pediatrician							
Yes	356	97.3	157	44.1	199	55.9	0.318
No	10	02.7	6	60.0	4	40.0	
Monitoring of the child by the nurse							
Yes	70	19.2	38	54.3	32	45.7	0.075
No	294	80.8	125	42.5	169	57.5	
Monitoring of the child by the dental surgeon							
Yes	142	38.8	64	45.1	78	54.9	0.870
No	224	61.2	99	44.2	125	55.8	
Use of dental services							
Used the public service	44	12.0	20	45.5	24	54.5	
Used the private service	144	39.4	64	44.4	80	55.6	0.991
Never used	178	48.6	79	44.4	99	55.6	
Access to information about the CHR							
Yes	217	59.6	106	48.8	111	51.2	0.043
No or don't know	147	40.4	56	38.1	91	61.9	
Entries by the mothers or fathers on the CHR							
Yes	80	22.1	46	57.5	34	42.5	0.011
No or don't know	282	77.9	117	41.5	165	58.5	

Source: Field research, 2014. **Resulting p value of *Pearson's* Chi-square test. The variables in bold type were included in the initial model of the multiple analysis.

Table 5. Factors associated with unsatisfactory quality of entries recorded in the Child Health Record (CHR) in the multiple analysis. Belo Horizonte. 2014.

Variables	Gross OR (95% CI)	Adjusted OR (95% CI)
Gestational age		
< 37 weeks	1	1
≥ 37 weeks	0.51 (0.27-0.99)	0.52 (0.27-0.98)
Access to information about the CHR		
Yes	1	1
No	1.55 (1.01-2.38)	1.55 (1.04-2.45)
Entries recorded by the mothers or fathers in the CHR		
Yes	1	1
No	1.91 (1.15-3.15)	1.97 (1.17-3.36)

Source: Field research, 2014. Model adjusted by the sex of the child, years of schooling of the mother, workplace of the mother and the person interviewed, namely mother or father. *Hosmer and Lemeshow* = 0.801.

als working in the primary network did not acknowledge the role of the family in completing the CHR[26]. In the perception of these professionals, the family does not "understand the concept," "should not complete it because much data is lost and we even ask them not to make entries," "the family does not always have a literate person." Reinforcing this result, many professionals said they do not encourage mothers to record entries in the CHR. This kind of professional attitude may contribute to the fact that only 25% of mothers reported recording entries in the CHRs of their children. These perceptions of professionals reflect the lack of prestige that the family has as a caregiver, and the lack of recognition that healthcare is also produced in the informal network, represented by the family[27]. Professional attitudes of this nature limit the active participation of the family and the mother and do not foster the autonomy of subjects in healthcare. They can also be the result of historical and cultural issues, since health initiatives have traditionally been delegated to professionals, whereby other actors are not allowed to participate in this process[6].

Since the launch of the CHR, the Ministry of Health has recommended greater participation, involvement and the commitment of parents to ensure comprehensive care to children and their rights as citizens[5]. The current model of the CHR contains only the identity page to be filled out by the parent or guardian, which can create a conflict in understanding and instructions for making entries both on the part of the family and the professionals. This analysis reveals the need for a review of the CHR regarding the actor responsible for filling it out.

A higher frequency of satisfactory completion of the CHR was detected when mothers/parents reported having received instructions on the CHR in the maternity ward or in other health services. The content of the instructions offered was not investigated in this study. The same association was previously observed in earlier studies[7,8] and access to guidance on the CHR was also associated with more entries for the weight for age curve[8]. Access to instructions may be necessary for the family to understand the role of the CHR in monitoring child health. A study in 2014 showed that mothers who received guidance on the CHR and those who reported watching when the professional made notes on the CHR tended to carry the CHR more often for appointments[10]. Professionals should use the tool to foster dialogue with the mother and family about the child's health. This approach is essential, since it favors the structured and cooperative care of mother, family and professionals[28]. The Manual for the use of the CHR states that "It is important that all those who take care of the child population, whether in families, or in day care centers, in pre-schools and other institutions, should study the information contained in that instrument for the effective monitoring of the health of the child, providing greater knowledge of his/her health history"[5].

In this study, the frequency of mothers who reported having received information about the CHR in the maternity ward or other services was 59.6%. Figures in the literature ranged from 33% to 67.5%[7,8,29]. The results suggest that the frequency of providing guidance to parents is not consolidated in maternity wards and/or other health services. The failure to offer guidance to families may result in demotivation and also failure to acknowledge the importance of the CHR by parents. In a study that questioned mothers about the purpose of the CHR, 45% of mothers said the CHR serves as a vaccination card, 12% stated that it serves as a tool for information and communication between professionals and family and 6.5% of mothers considered that the CHR serves no purpose[29].

The CHRs of children born prematurely were more frequently filled out unsatisfactorily. A study that analyzed the difficulty of caring for a premature child pointed out that problems in comprehensive care of child health and the lack of a human dimension in the relationship between the mother and the health service have been obstacles to the development of premature infants[30]. Feelings of insecurity and fear were associated with premature birth and the support and welfare to the family proved fundamental for solving them[31]. The importance of maternal empowerment, in the care of hospitalized children was highlighted in a study in Canada[32] and communication between nurses and families contributed to the individual empowerment process of mothers of premature newborns[33]. These findings reveal the importance of the involvement of the mother and the actions of health services in the care of premature children. Prematurity may represent a new situation in the household, full of care and aspects that must be observed by the family and the CHR may play a less important role in child care.

Some variables previously associated with the quality of entries recorded in the CHR revealed no association in this study, namely mother's age, education, income, number of pregnancies.

A study in England found that younger mothers and socially disadvantaged conditions (residence in poorer communities, mothers of large families, low maternal schooling) were associated with less effective use of the recording instrument[4]. However, Cormack et al. (1998) found no significant effect of maternal age[34]. The mother's education had no association with the quality of completion of the CHR, unlike previous studies that found an association between higher schooling and better filling out of instruments to record child health[4,6,7,9]. A study in 2005 showed an association between better completion of the growth curve on the CHR and mothers who work at home. There was also an association between better filling out of the development curve and first-time mothers[6]. Child health record tools were used more by first-time mothers in accordance with some international studies[34,35]. However, comparability between studies was hampered by the variability in the methodology in aspects related to the collection method, the CHR items evaluated and the selection of the sample. In this study, the sample selection method chosen may have influenced the results observed because the children/parents were selected on a Saturday of a multiple vaccination campaign, which may have favored the inclusion of those who use health services less regularly, or who use private health services (72.3%), with high average income and schooling, since most work outside the home (70.1%), if one considers the profiles of the mothers that use the public service for monitoring their children's health[7]. Nonetheless, the factors associated with the quality of filling out the multiple model remained independently associated with the gender of the child, the mother's years of schooling and the mother's workplace.

Described as one of the founding principles of Primary Care, Brazil's Primary Healthcare Network (PNAB) coordinates the comprehensiveness of care in its various aspects and encourages the participation of users in order to expand their autonomy and capacity in the construction of healthcare[13]. Actions for health promotion, disease prevention and health surveillance are all part of the comprehensive package and identify with the proposals of the CHR. The unsatisfactory recording of entries in the CHR calls into question the use of this tool in child care, indicating losses in its potential to foster communication with the family and the comprehensive care of the child. The results showed that working with the family is a way of contributing to the use of the instrument. This finding was consistent with one of the guidelines of the National Policy of Comprehensive Healthcare for the Child (PNAISC), which is to foster the autonomy of care and co-responsibility of the family[36]. The quality of the entries recorded in the CHR was not significantly influenced by the monitoring of the child by the public service. If on the one hand it is a wake-up call regarding practices that have been perpetuated in the industry, on the other it also becomes a stimulus for the effective implementation and consolidation of the principles and the strategic actions of PNAISC.

The results suggest that there are problems in the quality of the way the CHR is completed regardless of the type of service used by parents to monitor their children. Failure to fill out the CHR may compromise the monitoring and promotion of child health. Providing guidance and counting on the participation of mothers/families are considered essential actions for use of the CHR. Effective use of the CHR is currently being ensured by an improvement of the instrument, including adequacy of form and language to promote greater understanding by the family, as well as facilitating the input of information by the health professionals. The training of the professionals involved can enhance the value attributed to the instrument, contributing such that the CHR can achieve its objectives.

Collaborations

LP Amorim and RC Ferreira participated in the outline, design, analysis, drafting and interpretation of the data. MIB Senna, M Vasconcelos, EF Ferreira and PMP Zarzar participated in the critical revision of the article. ARS Soares e GTN Carneiro participated in the construction of the database and analysis and interpretation of the results.

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