Filling process of the Child Health Record in health care services of Belo Horizonte, Minas Gerais, Brazil*

Leonardo de Paula Amorim[1] – ⓘ orcid.org/0000-0001-8597-7424
Maria Inês Barreiros Senna[1]
Viviane Elisângela Gomes[1]
João Henrique Lara do Amaral[1]
Mara Vasconcelos[1]
Adriana Gonçalves da Silva[1]
Simone Dutra Lucas[1]
Raquel Conceição Ferreira[1]

[1]Universidade Federal de Minas Gerais, Departamento de Odontologia Social e Preventiva, Belo Horizonte, MG, Brasil

Abstract

Objective: to describe the filling process of the Child Health Record (CHR) in health care services. **Methods**: descriptive study held in Belo Horizonte, Minas Gerais, Brazil; an interview was conducted with parents/guardians of children aged 3-5 years old; 21 essential items to child monitoring were observed in the CHR during the 2014 Multi-vaccination Day; fields that should be filled in maternity wards, Primary Health Care (PHC), and other services were assessed separately. **Results**: 367 children (96.1%) were included; 44.5% of CHR presented ≥60% of completeness; among the items that should be recorded in maternity wards, birth weight showed the highest proportion of completeness (64.5%); for those that should be filled in PHC/other services, records of vaccines (94.0%) presented the highest completeness; there was more filling in maternity wards than in PHC and other services (p<0.001). **Conclusion**: a low proportion of filling was observed, especially in PHC and other services.

Keywords: Child Health; Primary Health Care; Hospitals, Maternity; Health Records, Personal; Growth and Development.

Correspondence:
Leonardo de Paula Amorim – Rua Professor Moacir Gomes de Freitas, No. 688, Pampulha, Belo Horizonte-MG, Brasil. CEP: 31270-901
E-mail: leo180381@gmail.com

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Introduction

Instruments that record children's health have favoured the transmission of information between health services, the family involvement in child's care and the availability of the child's health information to family members.[1,2] In Brazil, the Child's Health Card (CC), released between 1974 and 1975, aimed to unify the information about the child and to be a link between the health service and the family, as well as to promote the monitoring of the child's growth.[3] The Child Health Record (CHR) was created from the revision of the CC in 2005, with the adoption of the MERCOSUR resolution in which member countries came along with common background information for child health monitoring instruments.[4]

> *The assessment on quality filling of the CHR can reveal the organizational and operational aspects of health services.*

The CHR proposes the full monitoring of the child health based on health surveillance. It was organized into two parts: the first, to be completed by the child's parents, covers the identification data of both the child and the parents and contains health-related guidelines and child's and parents' rights; the second part is intended for registration by health professionals in maternity wards or during the monitoring of the child, in the Primary Health Care (PHC) or in other services, including data on pregnancy, childbirth and the puerperium, newborn data, as well as useful data records for the supervision of a child's development.[5] Moreover, the CHR presents information on the development of the teeth, dental caries and guidelines for cleaning the mouth/teeth; and has a field for 'oral health procedures records', with eruption schedule and odontogram.[5]

The importance of the CHR in child health surveillance has been highlighted;[6-17] however, some problems in its filling were observed. Studies conducted in Minas Gerais (Belo Horizonte and Pouso Alegre), São Paulo (a small town), Piauí (Caracol and Anísio de Abreu), Rio Grande do Sul (Pelotas) and Mato Grosso (Cuiabá), between 2005 and 2014, showed missing or incomplete records in the fields of CHR, especially in the curve of growth and child development.[6, 16.17]

A systematic review to evaluate the CC or the CHR by health professionals concluded that '[…] the diagnosis of use and quality of the filling process of these instruments in Brazil is restricted to a few local studies, which do not assess all the variables considered indispensable for monitoring the health of the child'.[15] The assessment on quality filling of the CHR can reveal the organizational and operational aspects of health services. According to what has been established by the manual and guidelines for the use of the CHR, there are fields that should be filled in the maternity ward and fields whose records should be registered in other health care services. Therefore, this study aims to describe the filling process of the children's health record – CHR – in health services.

Methods

Cross-sectional study performed in Belo Horizonte, capital of Minas Gerais State, located in the Southeast region of Brazil.

In 2010, Belo Horizonte had a resident population of 106,398 children from 1 to 4 years old and 144,868 from 5 to 9 years old,[18] and human development index (HDI) of 0.810.[19] In 2013, the municipality had 147 primary health care units (PHC unit), 583 family health teams and 307 oral health teams in nine Health Districts.[20]

Children resident in Belo Horizonte who carried the 6th Edition of the CHR (2009) – current version at the time of research and which incorporated the fields related to oral health – were included in the study. The age group of three to five years old was selected because according to the manual of the CHR, it is in that age that children present all the deciduous teeth erupted and absence of eruption of the permanent teeth,[5] which are requirements for the assessment of the oral health fields.

The formula to estimate the proportion was used in the sample calculation, considering the following parameters: prevalence for satisfactory filling (at least 13 of the 21 items filled, i.e., filling percentage $\geq 60\%$)[6] of CHR of 70%,[6] 95% confidence level, 5% error, and 20% to compensate losses. The correction for finite population was carried out, considering the number of children from three to five years old equals to 81,145 in 2010 (the closest data available to the year of data collection, provided by the municipal information system Intranet). The calculation resulted in a sample of 382

participants, which was stratified and proportionalized to the number of children from three to five years old in each of the nine Health Districts.

Data were collected on November 22nd 2014, during the National Campaign of Child Multi-vaccination. In each Health District, two PHC unit with a greater number of children in their areas were chosen for convenience. In each PHC, participants were approached before vaccination. The data were collected after the vaccination, through structured interview with one of the parents and observation of the CHR.

The script for the interview contained variables for sociodemographic characterization of the mother and the child: mother's age (in complete years); family income (in BRL); number of people living with this income; and child's sex (male; female). The per capita income was obtained by dividing the family income by the number of people living with this income.

The script of observation included 19 fields of CHR considered essential to the monitoring of child health plus oral health fields just as the study of Alves et al.[6]. For the evaluation of 21 fields, the manual guidelines for the use of the CHR published by the Ministry of Health were followed,[5] considering the health services where they should preferably be filled:
- filling by the parents (ID items: name of the child and the mother; date of birth);
- filling in the maternity ward (trimester of beginning and number of prenatal care visits; type of labour; cephalic weight, length and perimeter at birth; Apgar score at 5th minute; gestational age; type of the child's diet when discharged from the maternity ward); and
- filling in the PHC/other services (neuropsychomotor development; cephalic perimeter and birth weight recorded in the graph; age when the last point of the cephalic perimeter and weight was recorded on the chart; record in eruption timelines and odontogram; record of iron complementation; record of immunizations).

The records of the child's first year of life were considered in the assessment of the neuropsychomotor development and age when the last point of the cephalic perimeter and weight was registered on the chart, aiming the standardization between observations and comparison with previous study.[6] The maximum range to record the weight and cephalic perimeter in the charts was of three months. The filling of the neuropsychomotor development field was considered correct when at least three records were present; and for the vaccines record,

when the calendar was complete for age or with less than a month delay. To minimize errors, the vaccine condition has been verified by the team responsible for vaccination in each PHC unit, since these workers know the full vaccination schedule.[6] The presence of tooth eruption was evaluated regardless of the number of teeth marked, since the CHR does not have the dental appointment date or the age of the child at the time of evaluation, which makes the analysis of filling impossible. The odontogram was evaluated only for its use, since the absence of subtitles to record healthy teeth made it impossible to conclude absence of filling or oral alterations. The presence or absence of information were considered for other fields; records accuracy was not investigated.

A pilot study conducted in a PHC unit allowed adjustments following the CHR observation items. There was no change on the content of the instrument. Thirty-six trained interviewers (5 hours of theoretical and practical training) who are dentistry scholars at the Federal University of Minas Gerais (UFMG) performed the CHR interview and observation. During the Multi-vaccination Day, in each PHC unit, two students were responsible for data collection, monitored by the research coordinators with the WhatsApp® application in real time. The double typed database by two independent researchers enabled the correction of typos by consulting the original scripts.

The absolute and relative frequency of filling of each CHR field and the CHR frequency with filling percentage of $< 60\%$, $\geq 60\%$, $\geq 70\%$, 80% and $\geq 90\%$ were obtained. The percentage of the CHR filling was calculated considering the total of 21 fields evaluated and, separately, to the three identification fields, nine to be filled in the maternity ward and nine in the PHC/other services. The filling percentage results were represented in graphs. The Pearson chi-square test or the Fisher's exact test were used to test the association between the percentage of fields' filling to be registered at birth or in the PHC/other services. The Mann Whitney test was used to compare the number of fields in the CHR completed in the maternity ward or PHC/other services. The 17.0 version of the software SPSS® was used.

The project was approved by the research ethics committees of the UFMG and Belo Horizonte City Hall (CAAE: 35282614.2.0000.5149, 10/15/2014). The children's parents signed a free informed term of consent.

Results

A total of 367 children (96.1%) whose parents were interviewed and their CHR observed were included. There were 15 refusals. The majority (72.5%) of respondents were mothers (average age of 33.7 years old; standard deviation [sd] = 6.5); the average family income was BRL 1,422.73 (sd = BRL 1,277.46) and 56.9% of CHR were of male children.

The CHR fields more frequently filled were name and date of birth of the child and the mother's name. There was a higher filling of weight and length at birth among the fields to be recorded in the maternity ward. The records of the vaccines were the most filled among those to be filled in the PHC/other services. There was a high frequency of not filled in the odontogram (99.2%) and in the field of dental eruption (98.6%) of CHR (Table 1).

A total of 44.5% of the CHR had ≥ 60% of the items completed (Figure 1). Percentage of filling in the fields to be recorded in the maternity ward ≥ 80% was observed in 41.7% of CHR, a frequency of 0.8% when considering the same percentage of filling in the fields belonging to PHC/other services (Figure 2).

The CHR with ≥ 60% and ≥ 70% filling in the registration fields in the PHC/other services were significantly higher when the CHR also showed higher percentage of filling (≥ 60%) of the registering fields in the maternity ward. This difference was not observed for the largest percentage of fields in the PHC/other services (80 and 90%), by the small number of CHR with these filling percentages (Table 2). The number of fields in maternity wards filled was significantly higher than the number of fields filled in the PHC/other services (Mann Whitney test; $p < 0.001$).

Table 1 – Filling frequency of the 21 fields of the Child Health Record (n=367), Belo Horizonte, Minas Gerais, 2014

Fields of the Child Health Record	Filling					
	Yes			No		
	n	%	95%CI[a]	n	%	95%CI[a]
Data to be filled by the child's parents						
Child's name	364	99.5	97.8;99.8	2	0.5	0.1;2.2
Date of Birth	364	99.2	97.5;99.7	3	0.8	0.3;2.5
Mother's name	354	96.5	93.9;97.9	13	3.5	2.1;6.0
Data to be filled by maternities						
Birth weight	236	64.5	59.4;69.2	130	35.5	30.8;40.6
Birth lentgh	232	63.4	58.3;68.2	134	36.6	31.8;41.7
Type of delivery	206	56.1	51.0;61.1	161	43.9	38.9;49.1
Cephalic perimeter at birth	205	56.0	50.9;61.0	161	44.0	38.9;49.1
Child's gestational age	200	54.8	49.6;59.8	165	45.2	40.1;50.4
Apgar score at 5th minute	197	54.0	48.8;59.1	168	46.0	40.9;51.2
Trimester of first prenatal care visit	142	38.7	33.8;43.8	225	61.3	56.1;66.2
Type of fuding when discharged from the maternity ward	131	36.0	31.2;41.1	233	64.0	58.9;68.8
Number of prenatal care visits	129	35.1	30.4;40.2	238	64.9	59.8;69.6
Data to be filled in PHC[b]/other services						
Record of vaccines	344	94.0	91.0;96.0	22	6.0	3.9;8.9
Birth weight (chart)	237	64.8	59.7;69.5	129	35.2	30.5;40.3
Age of the last recorded weight in the chart	229	62.7	57.6;67.6	136	37.3	32.4;42.4
Cephalic perimeter at birth (chart)	213	59.0	53.8;64.0	148	41.0	36.0;46.2
Age of the last cephalic perimeter registered in the chart	187	51.8	46.6;56.9	174	48.2	43.1;53.4
Neuropsychomotor development	22	6.0	4.0;9.0	342	94.0	91.0;96.0
Use of iron registry	17	4.6	2.9;7.3	349	95.4	92.6;97.1
Register of tooth eruption schedule	5	1.4	0.6;3.3	360	98.6	96.7;99.4
Odontogram register	3	0.8	0.3;2.5	362	99.2	97.4;99.7

a) 95%CI: confidence interval of 95%.
b) PHC: Primary Health Care.
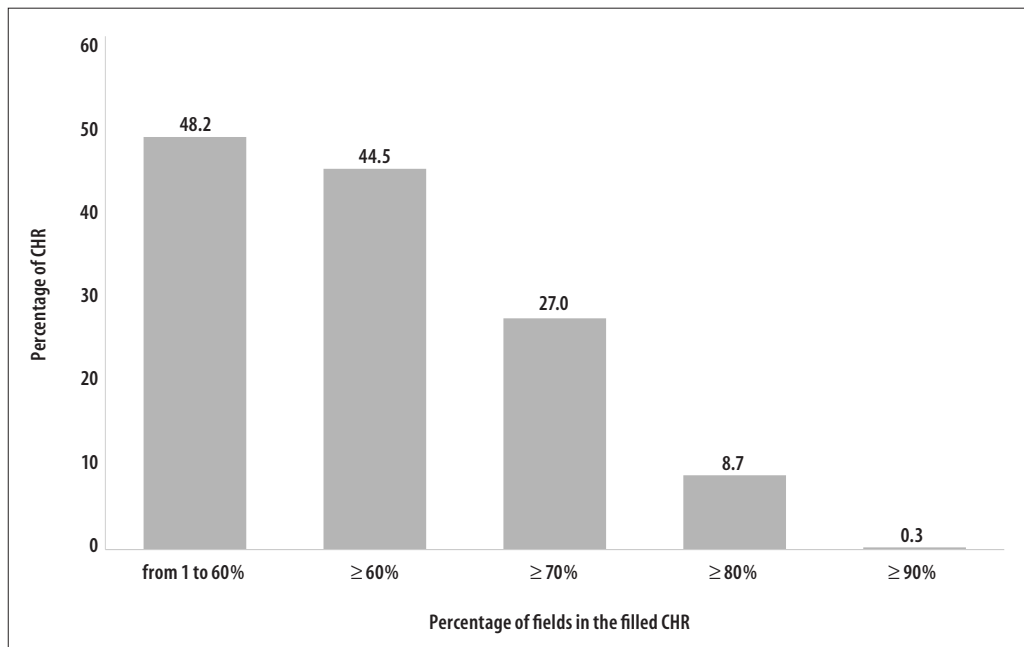
Note: No CHR presented 100% of completed fields.

Figure 1 – Frequency of Child Health Record (CHR) according to the filling percentage, considering all the observed fields, Belo Horizonte, Minas Gerais, 2014
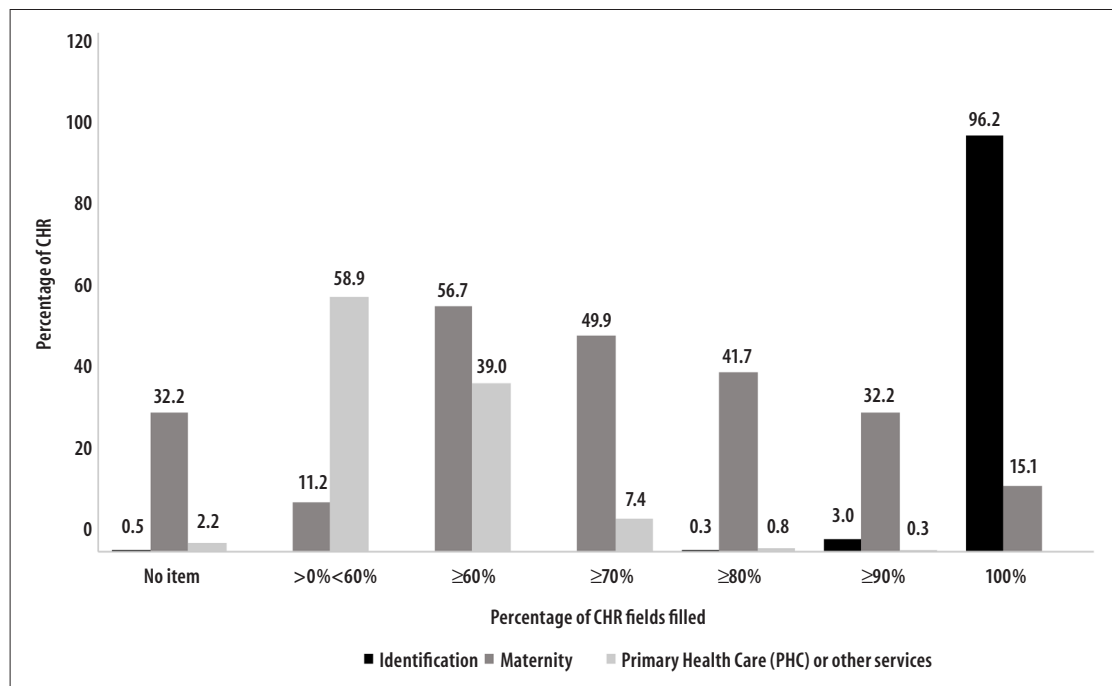

Figure 2 – Frequency of Child Health Records according to the filling percentage of identification fields, in maternity wards or in Primary Health Care (PHC)/others health services to monitor the child's health, Belo Horizonte, Minas Gerais, 2014

Table 2 – Filling percentage of Child Health Records (CHR) in Primary Health Care (PHC)/other services, according to the percentage of filling in the maternity ward (n = 367), Belo Horizonte, Minas Gerais, 2014

Filling percentage of the CHR fields to be filled in the maternity ward		Filling percentage of CHR fields to be filled in the PHC/other services			
		≥60%	≥70%	≥80%	≥90%
	Total				
<60%	159 (43.3)	28.3	2.5	–	–
≥60%	208 (56.7)	47.1	11.1	1.4	0.5
p-value		<0.001 [a]	0.002 [b]	0.261 [b]	0.567 [b]
<70%	184 (50.1)	–	3.8	–	–
≥70%	183 (49.9)	–	10.9	1.6	0.5
p-value		–	<0.009 [a]	0.123 [b]	0.499 [b]
<80%	214 (58.3)	–	–	0.5	–
≥80%	153 (41.7)	–	–	1.3	0.7
p-value		–	–	0.573 [b]	0.417 [b]
<90%	249 (67.8)	–	–	–	–
≥90%	118 (32.2)	–	–	–	0.8
p-value		–	–	–	0.328 [b]
Total		143 (39.0%)	27 (7.4%)	3 (0.8%)	1 (0.3%)

a) Pearson's Chi-square Test.
b) Fisher's exact Test.

Discussion

Most fields filled in the CHR were related to the identification of mother and child. The birth weight showed the highest proportion of filling among items to be recorded in maternity wards; the fields of vaccines were the most frequent amongst those to be filled in PHC/other services. There was a higher filling in the items of maternity wards compared to those to be filled in PHC/other services.

This highest filling of identification items had been observed previously in cross-sectional studies carried out in Belo Horizonte (2006)[6] and Pelotas (2008),[8] and can be explained by the parents' domain of the information.

The highest percentage of filling of birth weight was consistent with the observed outcomes in Belo Horizonte (2005 and 2006), Pouso Alegre (2012) and Cuiabá (2011),[6,7,9,17] among the fields to be recorded in the maternity ward, perhaps for being a neonatal health indicator culturally used and a newborn most required information both by the family and by health professionals.[17]

The trimester of beginning (38.7%) and the number of prenatal care visits (35.1%) were the least filled fields, representing lower percentages than those observed in Belo Horizonte, in 2005 and 2006, which ranged from 58.0 to 69.9%. [6,7] However, they were higher than those observed in Cuiabá, in 2011, of 11.9% for number of visits and 14.7% for beginning of prenatal care.[17] The only possible explanations for the low values observed in Cuiabá was the mother's card filling, or the fact that the mother did not take the card to the hospital or to the first visit of the child,[17] which may also explain the results observed in this study.

The mother's card has also been used to evaluate the quality of assistance to pregnant women in prenatal care; however, the low percentage of recommended number of prenatal care visits filling was also evidenced in this document.[21] The unification of the mother's card and the CHR cards would facilitate the work process in health services, contributing to qualify the record and the assistance to mother and child health.

These results can highlight problems in the assistance to pregnant women in prenatal care.[7] This assistance must be guaranteed, considering that the increased frequency of prenatal care visits and early assistance to pregnant women were associated with lower rates of low weight birth[22] and children and neonatal mortality.[23] Abud and Gaíva, when studying the data filling on pregnancy, childbirth, puerperium and the newborn in the CHR in Cuiaba,[17] recommended for professionals that during the follow-ups of pregnancy, to reinforce the fact that '[...] the card is a document to be used during the prenatal care and in the maternity ward, on the occasion of child birth to access fundamental

data that will facilitate the monitoring of the child by health professionals'.

The completeness of Apgar at 5th minute was lower than that observed in 2005, in the sample of children from PHC unit of Belo Horizonte (74%),[7] and in 2008, in Pelotas (90%),[24] similarly observed in a random sample obtained during the Child Multi-vaccination Day in Belo Horizonte in 2006 (53.5%)[6] and in Cuiabá in 2011[17] (60.4%); and among children from the area of two PHC unit of Pouso Alegre in 2012 (66%).[9] The variances observed can be explained by different methods of the participants' selection. A larger percentage of filling from the actions of labour humanization and birth, and the establishment of Apgar evaluation in all newborn by the Ministry of health,[25] in addition to the presence of the paediatrician in the delivery room were expected. The lack of filling in that field in the certificates of live births was justified by the failure of measurement in the maternity ward or by the little care on recording the information, suggesting low quality of attention to labour and to the newborn.[26] The low registration involves the restriction of this information use, which is a measure of viability of newborn and an important indicator of neonatal mortality.[27]

The type of diet when discharged by the maternity ward was one of the two items less filled (36.0%), but it was higher than that observed in Cuiabá (2011), 14.5%.[17] According to the Ministry of Health,[28] exclusive breastfeeding should be started immediately after labour, and encouraged at least until the 6th month of life. This record could contribute to PHC interventions to prevent early weaning, whose risk is higher among children who did not start breastfeeding in the maternity ward.[6]

Among the items to be filled in the PHC/other services, there was a higher completeness regarding vaccination, consistently with previous results obtained in Belo Horizonte (2005 and 2006),[6,7] in the municipality of Pouso Alegre (2012),[9] in the countryside of Piauí (2008)[10] and in a small municipality of São Paulo State (2013),[11] with percentages between 91.8 and 100%. This result may indicate the excellence of the National Immunization Program (NIP), although it can also reveal that the CHR remains only as a "vaccination card".[9]

The correct filling of the weight charts and cephalic perimeter in the first year of life was observed in 62.7% and 51.8% of CHR, respectively, and notes on the neuropsychomotor development in 6.0% of CHR. Studies in Belo Horizonte (2006),[6] Pelotas (2009)[24]

and Cuiabá (2011)[16] also showed problems in filling these items. These results may demonstrate weak adherence of the basic actions of health professionals – of proven effectiveness – and the non-recognition of usefulness of the instrument to monitor the child in clinical practice.[13] In order to contribute to the record of this information, the CHR should be filled in the childcare visits recommended by Ministry of Health: seven childcare visits in the first 12 months of life, two in the second year and, from that age on, one per year.[5]

The oral health related fields were not filled in almost all of the CHR. The only study identified that considered the oral health items, held in Pouso Alegre (2012), revealed the absence of filling of these fields in 100% of the CHR.[9] The CHR can be used for epidemiological surveillance of oral diseases, directing actions of health promotion in primary and secondary care, together with other actions focused on maternal and child health. The instrument can contribute to the dialogue with mother and family, favouring cooperative care between mom, family and professionals.[29]

The results suggest that the CHR has been more filled in the maternity ward, indicating differences in the value of information present in each field of the CHR or of the working processes in childcare services by parents and professionals. The CHR should be the responsibility of all health services; however, it is '[...] mainly in maternity ward and in PHC that its adequate handling is a permanent management challenge, since these are the places where much information is generated'.[6]

The registration fields in PHC/other services presented a higher frequency when the filling of the fields to be recorded in the maternity ward were also more frequent. As the use of the CHR in the PHC/other services depends on parents to take them, this result suggests that when there is a participation of parents in the early years of life, the same happens as the child grows older. A study adopting a qualitative approach, through focus groups, between health professionals from PHC unit of Pelotas (2008), showed that many of these professionals have reported experiencing situations in which mothers recognize the importance and talk with them about topics discussed in the CHR, demanding and monitoring data of children.[8] Mothers of younger children who were informed about the importance of taking the CHR in health care and following up the child growth, had higher probability of taking the CHR for recording of information in health services.[11]

With the requirement of submission of the CHR to family health teams, a reduction in the recording problems is expected. However, if the record is a health professionals' responsibility, studies indicate the need to encourage them about the importance of CHR.[6-15] Literature review about the difficulties found by professionals for the use of CHR showed that they reported problems to get the information they need in the CHR, as well as to work with the concepts used in the booklet, such as the curves of reference represented in z scores and the graph of body mass index (BMI), besides sometimes not knowing the content of the instrument. The need to invest in professional training '[...] in order to arouse the awareness of the importance of understanding the booklet' was discussed.[30]

The data were collected during the national campaign of Multi-vaccination Day of 2014, with children from three to five years old, allowing a sample range. However, the results cannot be generalized to children of any age group. The selection of two PHC unit per Health District also limited the representativeness of the results for all children in Belo Horizonte. The evaluation of the CHR fields included filling in the first years of life, as advocated by previous studies, not affecting the validity of the results observed and the comparability with other studies. The analysis was conducted identifying the items that should be completed in the maternity ward or PHC/other services. However, the results may not reflect the practice in these services, since the filling of fields of CHR may have occurred in different places, not where it is recommended in the instrument; or even by the children's parents outside the health service context.

The CHR presented low frequency of filling of essential items to monitor the health of the child. This finding indicates that its use has been unsatisfactory by health professionals who work in childcare services, especially in PHC/other services. The proper use of the CHR can contribute to the Primary Health Care quality, promoting its coordination through the provision of information regarding problems and previous services used by the child and the recognition of such information, to the extent in that regarding the needs of service. Problems in the filling process compromise the integrity of health care, since no articulation of multi-professional action affects the continuity of care in various assistance levels. The CHR is an instrument that can favour dialogue among family members and health professionals,[7] increasing or facilitating the continuity of care. This action should be valued, given the importance of family involvement in the development and child growth.[2,7,8] Facing the challenge of precariousness in the CHR records goes through the training of health professionals who can recognize the importance of the instrument for monitoring children's health, as well as the empowerment of parents or guardians, who must carry and require the use of the CHR in the various child health care services.

Authors' Contributions

Amorim LP and Ferreira RC contributed in the conception, design, analysis, drafting and interpretation of data. Amorim LP and Silva AG contributed in the critical review of the literature on the topic. Senna MIB, Vasconcelos M, Amaral JHL and Gomes VE contributed in the analysis and interpretation of results and the critical review of the article. Silva AG and Lucas SD contributed in the construction of the database, analysis and interpretation of results. All authors approved the final version of the manuscript and are responsible for all aspects of study, ensuring its accuracy and integrity.

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