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Original Article

# Maternal ability to take care of children exposed to HIV

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Objective: to assess the ability of mothers to take care of children exposed to HIV, using the Assessment Scale of Care Skills for Children Exposed to HIV at Birth and to check the association between the scale dimensions and maternal characteristics. Method: this cross-sectional study involved 62 HIV+ mothers whose children of up to one year old had been exposed to the virus at birth. The Assessment Scale of Care Skills for Children Exposed to HIV at Birth consists of 52 items and five dimensions, indicating high, moderate or low care ability. Results: 72.7% of the mothers appropriately offered zidovudine syrup; 86.0% were highly skilled to prepare and administer milk formula; 44.4% were moderately able to prepare and administer complementary feeding; 76.5% revealed high ability to administer prophylactic treatment against pneumonia and 95.3% demonstrated high abilities for clinical monitoring and immunization. Significant associations were found between some maternal variables and the scale dimensions. Conclusion: the scale permits the assessment of maternal care delivery to these children and the accomplishment of specific child health interventions.

Descriptors: Child Care; HIV; Infectious Disease Transmission, Vertical; Pediatric Nursing.

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## Introduction

Among the recommendations related to the Brazilian national aids program, infected mothers develop specific prophylactic actions to avoid the vertical transmission (VT) of HIV during pregnancy. This includes regular antenatal monitoring, antiretroviral therapy (ARVs) or monotherapy using AZT (zidovudine) as from the 14th week of pregnancy and blood collection for CD4 cell and viral loading counts[1].

In the context of HIV/aids, the relevance of actions to promote the health and wellbeing of children who are vertically exposed to HIV is highlighted, as early responsibilities for health professionals and particularly nurses, related to the monitoring of treatment adherence.

Due to children's undefined serological status, a range of care is fundamental during the first years of life, ranging from the proper use of antiretroviral and antimicrobial agents to periodical monitoring at specialized care services, as well as routine health tests, a specific immunization schedule and appropriate nutritional therapy[1-2]. Based on the above, the mothers of these children play a fundamental role in the maintenance of these children's health when they assume the commitment to take care of them.

In addition to the social and family context, the family plays a fundamental role in care delivery for the child's health, who depends on other people to service. When discussing health care in the family context, the woman-mother as the main caregiver is practically a consensus[3-4].

Moreover, it is fundamental to establish interventions that permit, as early as possible, the identification of seropositive pregnant women and exposed children suffering from aids, outlining their trajectories, needs and this population's actual access to the health services, guaranteeing lesser risks of infection and permitting better survival[5].

Coping, vulnerability and the conditions set to administer life with HIV are problems assumed by the mothers of children suffering from HIV or who were exposed to the virus, ad sometimes by the children themselves. As they are continuously taking care of their children, taking them to the health services for periodical visits, helping them with the medication needed, accompanying them to different tests, the mothers play an outstanding role in these children's health promotion and dissemination[6]. Therefore, Nursing plays a monitoring role in all phases, besides their important role in health education.

To help the mothers and observe the care they deliver to the children exposed to HIV at birth, in the literature, the Assessment Scale of Care Skills for Children Exposed to HIV at Birth (EACCC-HIV) is available, which was developed and validated in Brazil and measures maternal health care to children exposed to HIV at birth[7]. Through this scale, after the scale, the means can be reflected to make the necessary changes in the children's health care.

In this context, the aim in this study was to assess the mothers' skills to take care of children exposed to HIV through the EACCC-HIV and the check the associations between the scale dimensions and the maternal characteristics.

## Method

This cross-sectional study was developed at two referral hospitals in care delivery to HIV/aids patients in Fortaleza-CE: the Hospital São José de Doenças Transmissíveis (HSJDT) and the Hospital Distrital Gonzaga Mota de Messejana (HDGMM).

The research was developed between January and June 2010. Participants were 62 biological mothers with 64 infants (two pairs of twins) exposed to HIV at birth, up to 12 months of age and identified based on the number of delivery notifications for pregnant women with HIV in Fortaleza between 2009 and 2010 (N=122). This sample represented 50.8% of births of children exposed to HIV at birth and in the age range up to one year. The following inclusion criteria were applied: being the child's mother and having skills to take care of the child. The exclusion criteria were: presence of mental illness, advanced stage of aids and any other condition that did not permit care for the child (physical or mental problem).

To collect the data, a form was used for the caregiver's (biological mothers) socio-demographic and clinical characteristics, and the Assessment Scale of Care Skills for Children Exposed to HIV at Birth[7].

The EACCC-HIV consists of 52 items and five dimensions and is focused on the assessment of children up to one year of age. Dimension I includes four items to assess children up to 42 days of life and serves to measure the maternal ability to administer AZT syrup; dimension II comprises 17 items, is directed at children up to one year of age and permits assessing the preparation and administration of formula. Through dimension III, with 22 items, care for children over four months of age can be observed, with a view to measuring the ability to prepare and administer complementary feeding. Dimension IV,

focused on children between 42 days of life and one year, permits verifying maternal skills to administer prophylaxis based on sulfamethoxazole and trimethoprim, through four questions. Finally, dimension V, consisting of five items, is focused on all children up to one year of age and measures the maternal skills to guarantee adherence to clinical monitoring and vaccination.

For each scale item, only one alternative can be indicated, ranging between 1 and 5. The scale dimensions were classified in three categories: low; moderate and high ability for care.

The interviews were held in consultation rooms at the abovementioned hospitals if available. Difficulties arose during the interviews due to a lack of private and safe places, because of the large number of patients being attended and professionals demanding the rooms. On average, the interviews took 50 minutes.

For analytic purposes, the variables were grouped in maternal characteristics; age group, evolutionary phase, diagnosis time, parity, education, economic classification criterion Brazil (CCEB) and family income.

Data analysis was focused on the mothers' socio-demographic and clinical characteristics, through the identification of care, using uni- and bivariate frequency distributions and descriptive measures (means, standard deviations and medians). Bivariate analyses were chosen to describe and verify the proportional differences between the care skills levels, expressed through the five EACCC-HIV dimensions, and the maternal characteristics, by applying Fisher's Exact Chi-square test. For all analyses, significance was set at 5% ($p_{Fisher} \leq 0,05$). Data were treated and results were analyzed in STATA v.11.0 statistical software.

In compliance with the requirements for research involving human beings, approval for the research project was obtained from the Research Ethics Commission at Hospital São José de Doenças Transmissíveis under protocol 43/2009. At Hospital Distrital Gonzaga Mota de Messejana, authorization was requested for data collection. The mothers who agreed to participate were asked to sign the Informed Consent Form.

## Results

Among the participating mothers, the prevalent age range (46.8%) was between 20 and 29 years. As regards the evolutionary stage, 66.1% were in the initial phases of the disease (asymptomatic infection = $HIV^+$), and the predominant diagnosis time was less than one year (61.3%). Parity was concentrated between one and three children (88.7%). With respect to education, 32.2% had less than five years of study. Concerning the economic classification, 48.4% belonged to class D. The majority (85.5%) was unemployed at the time of the research and the predominant family income varied between one and two minimum wages (46.8%). On the occasion of the research, the minimum wage corresponded to R$510.00.

Among the children, 35 were male (54.7%). Ages were distributed as follows: 8 children (≤ 1 month; 12.5%), 16 (2-3 months; 25.0%), 18 (4-6 months; 28.1%) and 22 (≥ 7 months; 34.4%). As regards the serological status (viral RNA), one child was reactive (1.6%); 12 were non-reactive (18.7%); 17 showed an inconclusive serological status (26.7%) and 34 had not taken the test yet (53.0%).

In Figure 1, the distribution of the care skill dimensions is displayed, stratified according to the skill level. As revealed, 72.7% of the mothers appropriately offered zidovudine (AZT) syrup; 86% scored high regarding the ability to prepare and administer formula; 44.4% showed moderate ability to prepare and administer complementary feeding; 76.5% revealed high ability to administer prophylactic treatment using sulfamethoxazole (SMX) and trimethoprim (TMP) and 95.3% demonstrated high abilities for clinical monitoring and immunization of the child. According to the global distribution of the combined answers on the child care ability level, the highest answer frequencies indicated moderate ability (46.9%), with similar percentages for low (23.4%) and high (29.7%) ability.

Table 1 shows the sum of the EACCC-HIV dimensions and aspects of the maternal variables and the correlation between the scale dimensions. Dimension I showed no maternal and family characteristics that identified significant proportional differences concerning the skills level to administer AZT syrup.

As regards dimensions II and III, no significant differences were found when correlating the maternal variables with the supply of milk formula and complementary feeding. In addition, according to relative and absolute data for the assessed children's nutritional profile (data not displayed in the table), 86.0% had not been breastfed by their mothers. Concerning the type of milk, the majority consumed milk formula/Nestogênio (46.9%), with 57.8% of the children revealing inappropriate milk intake. Irregularities were related to the dilution and frequency at which milk was offered. With regard to complementary feeding (CF), 30 children (47.0%) were already receiving CF on a regular base,

while ten (15.5%) should have started complementary feeding but only consumed milk. Among the results, it is noteworthy that 55.0% revealed inappropriate CA consumption.

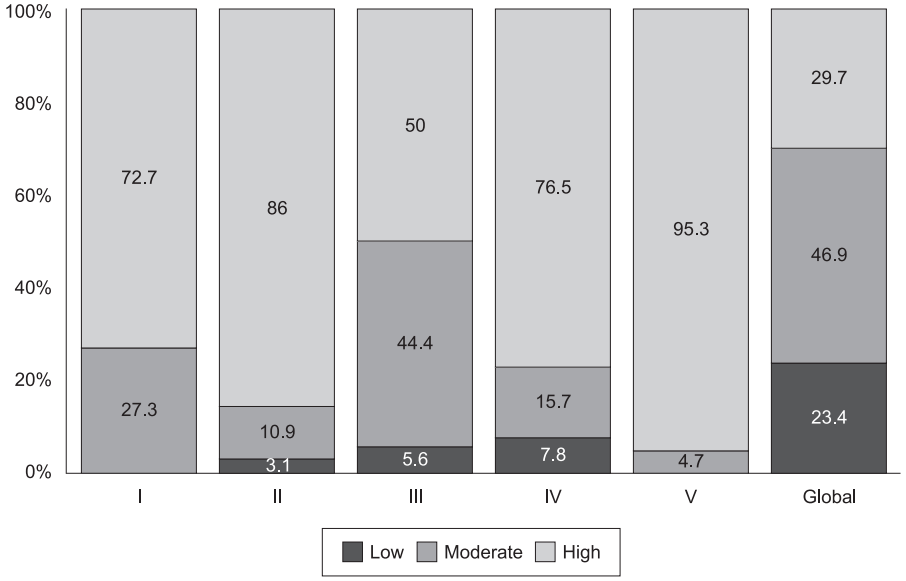


Figure 1 - Percentage distribution of care skills dimensions. Fortaleza, CE, Brazil, 2010

When analyzing dimension IV and the maternal variables as identified, seven (11%) mothers indicated difficulties to administer SMX and TMP, due to personal limitations. Parity was concentrated between one and three children, with strong variations among the low, moderate and high care levels, and indicated significant proportional differences in the borderline level regarding skills for SMX and TMP prophylaxis ($p_{Fisher}$ = 0.051).

In addition: the distribution of the maternal variables and the skills level to guarantee adherence to clinical monitoring and immunization revealed great variations in parity rates according to low, moderate and high care skills, with significant proportional differences related to adherence to clinical monitoring and immunization ($p_{Fisher}$ = 0.031). As regards education levels in years of study, significant proportional differences were found in the ability to guarantee adherence to clinical monitoring and immunization ($p_{Fisher}$ = 0.030). As verified, among those mothers with less than five years of education, the ability to guarantee adherence ranged from moderate to high, but remained high among mothers with six to nine years of education and more.

Table 1 - Distribution of maternal variables and dimensions of care skills for children exposed to HIV. Fortaleza, CE, Brazil, 2010

| Maternal characteristic | Dimensions of Care Skills | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | I | | | II | | | III | | |
| | Low | Moderate | High | Low | Moderate | High | Low | Moderate | High |
| | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) |
| Age group | | p=1.000 | | | p=0.195 | | | p=0.836 | |
| 18-29 | - | 2 (66.7) | 4 (57.1) | 0 (0.0) | 3 (42.9) | 32 (59.3) | 1 (50.0) | 8 (50.0) | 11 (64.7) |
| 30-39 | - | 1 (33.3) | 3 (42.9) | 1 (100) | 3 (42.9) | 21 (38.9) | 1 (50.0) | 7 (43.8) | 5 (29.4) |
| 40-49 | - | 0 (0.00) | 0 (0.00) | 0 (0.0) | 1 (14.2) | 1 (1.8) | 0 (0.0) | 1 (6.2) | 1 (5.9) |
| Evolutionary phase | | p=1.000 | | | p=0.791 | | | p=1.000 | |
| HIV | - | 2 (66.7) | 5 (71.4) | 1 (100) | 4 (57.1) | 36 (66.7) | 1 (50.0) | 9 (56.3) | 9 (52.9) |
| Aids | - | 1 (33.3) | 2 (28.6) | 0 (0.0) | 3 (42.9) | 18 (33.3) | 1 (50.0) | 7 (43.7) | 8 (47.1) |

*(continue...)*

Table 1 - (continuation)

| Maternal characteristic | Dimensions of Care Skills | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | I | | | II | | | III | | |
| | Low | Moderate | High | Low | Moderate | High | Low | Moderate | High |
| | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) |
| Diagnosis time | | p=0.200 | | | p=0.508 | | | p=0.868 | |
| ≤ 1 | - | 0 (0.0) | 4 (57.1) | 0 (0.0) | 5 (71.4) | 33 (61.1) | 1 (50.0) | 10 (62.5) | 8 (47.1) |
| 2-5 | - | 1 (33.3) | 2 (28.6) | 1 (100) | 1 (14.3) | 15 (27.8) | 1 (50.0) | 5 (31.3) | 7 (41.2) |
| ≥ 6 | - | 2 (66.7) | 1 (14.3) | 0 (0.0) | 1 (14.3) | 6 (11.1) | 0 (0.0) | 1 (6.2) | 2 (11.7) |
| Parity (No. of children) | | | | | p=1.000 | | | p=0.481 | |
| 1 – 3 | - | 3 (10 0) | 7 (100) | 1 (100) | 6 (85.7) | 48 (88.9) | 2 (100) | 13 (81.3) | 16 (94.1) |
| ≥ 4 | - | 0 (00.0) | 0 (00.0) | 0 (0.0) | 1 (14.3) | 6 (11.1) | 0 (0.0) | 3 (18.7) | 1 (5.9) |
| Education (years) | | p=0.667 | | | p=0.063 | | | p=0.740 | |
| ≤ 5 | - | 0 (0.0) | 1 (14.3) | 1 (100) | 5 (71.4) | 14 (26.0) | 1 (50.0) | 6 (37.5) | 4 (23.5) |
| 6-9 | - | 1 (33.3) | 4 (57.1) | 0 (0.0) | 1 (14.3) | 20 (37.0) | 0 (0.0) | 4 (25.0) | 7 (41.2) |
| ≥ 10 | - | 2 (66.7) | 2 (28.6) | 0 (0.0) | 1 (14.3) | 20 (37.0) | 1 (50.0) | 6 (37.5) | 6 (35.3) |
| CCEB | | p= 1.000 | | | p=0.409 | | | p=0.240 | |
| B (B1+B2) | - | 0 (0.0) | 1 (14.3) | 0 (0.0) | 0 (0.0) | 1 (1.9) | - | - | - |
| C | - | 2 (66.7) | 4 (57.1) | 1 (100) | 3 (42.8) | 19 (35.2) | 0 (0.0) | 7 (43.8) | 9 (52.9) |
| D | - | 1 (33.3) | 1 (14.3) | 0 (0.0) | 2 (28.6) | 28 (51.8) | 1 (100) | 6 (37.5) | 8 (47.1) |
| E | - | 0 (0.0) | 1 (14.3) | 0 (0.0) | 2 (28.6) | 6 (11.1) | 0 (0.0) | 3 (18.7) | 0 (0.0) |
| Family income (minimum wages) | | p=1.000 | | | p=0.624 | | | p=0.928 | |
| < 1 | - | 1 (33.3) | 2 (28.6) | 0 (0.0) | 2 (28.6) | 22 (40.7) | 1 (50.0) | 5 (31.3) | 7 (41.2) |
| 1-2 | - | 2 (66.7) | 3 (42.9) | 1 (100) | 3 (42.8) | 25 (46.3) | 1 (50.0) | 8 (50.0) | 8 (47.1) |
| ≥ 3 | - | 0 (0.0) | 2 (28.5) | 0 (0.0) | 2 (28.6) | 7 (13.0) | 0 (0.0) | 3 (18.7) | 2 (11.7) |

| Maternal characteristic | Dimensions of Care Skills | | | | | |
|---|---|---|---|---|---|---|
| | IV | | | V | | |
| | Low | Moderate | High | Low | Moderate | High |
| | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) |
| Age group | | p=0.775 | | | p=0.095 | |
| 18-29 | 2 (50) | 6 (75.0) | 19 (50.0) | - | 1 (33.3) | 34 (57.6) |
| 30-39 | 2 (50) | 2 (25.0) | 17 (44.7) | - | 1 (33.3) | 24 (40.7) |
| 40-49 | 0 (0.0) | 0 (0.0) | 2 (5.3) | - | 1 (33.3) | 1 (1.7) |
| Evolutionary phase | | p=0.779 | | | p=0.263 | |
| HIV | 3 (75) | 4 (50.0) | 21 (61.8) | - | 1 (33.3) | 40 (67.8) |
| Aids | 1 (25) | 4 (50.0) | 13 (38.2) | - | 2 (66.7) | 19 (32.2) |
| Diagnosis time | | p=0.317 | | | p=0.324 | |
| ≤ 1 | 3 (75) | 4 (50.0) | 22 (64.7) | - | 2 (66.7) | 36 (61.0) |
| 2-5 | 0 (0.0) | 4 (50.0) | 9 (26.5) | - | 0 (0.0) | 17 (28.8) |
| ≥ 6 | 1 (25) | 0 (0.0) | 3 (8.8) | - | 1 (33.3) | 6 (10.2) |
| Parity (No. of children) | | p=0.051 | | | p=0.031 | |
| 1 – 3 | 3 (75) | 5 (62.5) | 35 (92.1) | - | 1 (33.3) | 54 (91.5) |
| ≥ 4 | 1(25) | 3 (37.5) | 3 (7.9) | - | 2 (66.7) | 5 (8.5) |
| Education (years) | | p=0.119 | | | p=0.030 | |
| ≤ 5 | 2 (50) | 5 (62.5) | 11 (28.9) | - | 3 (100) | 17 (28.8) |
| 6-9 | 1 (25) | 3 (37.5) | 11 (28.9) | - | 0 (0.0) | 21 (35.6) |
| ≥ 10 | 1 (25) | 0 (0.0) | 16 (42.1) | - | 0 (0.0) | 21 (35.6) |
| CCEB | | p=0.880 | | | p=0.089 | |
| B (B1+B2) | - | - | - | - | 0 (0.0) | 1 (1.7) |
| C | 1 (25) | 2 (25.0) | 11 (34.2) | - | 0 (0.0) | 23 (38.9) |
| D | 2 (50) | 5 (62.5) | 20 (52.6) | - | 1 (33.3) | 29 (49.2) |
| E | 1 (25) | 1 (12.5) | 5 (13.2) | - | 2 (66.7) | 6 (10.2) |

*(continue...)*

Table 1 - (continuation)

| Maternal characteristic | Dimensions of Care Skills | | | | | |
|---|---|---|---|---|---|---|
| | IV | | | V | | |
| | Low | Moderate | High | Low | Moderate | High |
| | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) |
| Family income (minimum wages) | | p=0.537 | | | p=0.742 | |
| < 1 | 3 (75) | 2 (25.0) | 16 (42.1) | - | 2 (66.7) | 22 (37.3) |
| 1-2 | 1 (25) | 4 (50.0) | 17 (44.7) | - | 1 (33.3) | 28 (47.5) |
| ≥ 3 | 0 (0.0) | 2 (25.0) | 5 (13.2) | - | 0 (0.0) | 9 (15.2) |

P-value obtained through Fischer's Exact Chi-square Test

In Table 2, the sum of all EACCC-HIV dimensions is displayed, indicating the mothers' degree of care. As observed, the maternal variables that indicated interference in the mothers' care skills for the children exposed to HIV at birth were: evolutionary phase (p=0.006) and diagnosis time (p=0.038). Concerning the evolutionary phase, among the mothers with a low global score, there are more mothers with HIV (93.3%) and less mothers with aids (6.7%). With regard to the diagnosis time, the mothers with a low global score had been diagnosed less than one year earlier (80%).

Table 2 - Distribution of maternal variables and global scale score. Fortaleza, CE, Brazil, 2010

| Maternal Variables | Global assessment* | | | P-value† |
|---|---|---|---|---|
| | Low | Moderate | High | |
| | n (%) | n (%) | n (%) | |
| Age group (years) | | | | 0.830 |
| Up to 29 | 9 (60.0) | 14 (50.0) | 12 (63.1) | |
| 30 to 39 | 6 (40.0) | 13 (46.4) | 6 (31.6) | |
| 40 to 49 | 0 (0.0) | 1 (3.6) | 1 (5.3) | |
| Evolutionary phase | | | | 0.006 |
| HIV (n=41) | 14 (93.3) | 19 (67.9) | 8 (42.1) | |
| Aids (n=21) | 1 (6.7) | 9 (32.1) | 11 (57.9) | |
| Diagnosis time | | | | |
| ≤ 1 | 12 (80.0) | 16 (57.1) | 10 (52.6) | 0.038 |
| 2-5 | 0 (0.0) | 10 (35.7) | 7 (36.8) | |
| ≥ 6 | 3 (20.0) | 2 (7.2) | 2 (10.5) | |
| Parity | | | | 0.677 |
| 1 to 3 children | 13 (86.7) | 24 (85.7) | 18 (94.7) | |
| ≥ 4 children | 2 (13.3) | 4 (14.3) | 1 (5.3) | |
| Education (years of study) | | | | 0.298 |
| ≤ 5 | 6 (40.0) | 11 (39.3) | 3 (15.8) | |
| 6-9 | 6 (40.0) | 7 (25.0) | 8 (42.1) | |
| ≥10 | 3 (20.0) | 10 (35.7) | 8 (42.1) | |
| CCEB | | | | 0.103 |
| B (B1+B2) | 0 (0.0) | 1 (3.6) | 0 (0.0) | |
| C | 3 (20.0) | 10 (35.7) | 10 (52.6) | |
| D | 10 (66.7) | 11 (39.3) | 9 (47.4) | |
| E | 2 (13.3) | 6 (21.4) | 0 (0.0) | |
| Family income (in minimum wages)‡ | | | | 0.767 |
| < 1 | 5 (33.3) | 10 (35.7) | 9 (47.4) | |
| 1-2 | 7 (46.7) | 15 (53.6) | 7 (36.8) | |
| ≥ 3 | 3 (20.0) | 3 (10.7) | 3 (15.8) | |

*Sum of all scale dimensions
†Fischer's Exact Chi-square test
‡ Minimum wage = 510.00

## Discussion

Decisions related to children and control over their lives are generally left in charge of the mother or caregiver as long as they do not have self-management power. Training and skills development actions should be focused on the mother figure with a view to achieving excellent child health levels[3].

It is known that mothers living with HIV need to correctly follow the recommendations of the Ministry of Health to enhance their children's wellbeing[8]. These women reveal concerns with their children's health since pregnancy[9]. To reduce these concerns, the mother's environment and living conditions need to be favorable to an effective care practice, which can justify the results presented here: mothers infected by HIV, but who have not reached the aids phase, and with a diagnosis time inferior to one year, offer less care to their children. These results suggest that the psychosocial aspects are strongly present,

(continue...)

related to the acceptance of the infection, interfering in childcare.

One may presume that the mother will only adhere to preventive treatment if she is sensitized to the possibility of the child being infected and if she understands that, to avoid the infection, all recommendations need to be followed[10]. The mothers' adherence is fundamental to reduce the children's risk of infection.

Moreover, healthcare skills for small children vary, mediated by different social factors present in their life context. Researchers discuss these factors and point out aspects related to the risk of child malnutrition, which are included in the dimensions under assessment (II and III), in combination to the family structure without the presence of the partner, maternal hospitalization during pregnancy, precarious maternal mental health, family stress, low maternal education, unemployed mothers and the child's age when the mother returned to work[11].

In the educational context of women with HIV, studies use the inclusion in the school context or education level to suggest the social category they are part of[12]. The education level of the parents or responsible caregivers influences the child's health care, as higher instruction and knowledge levels enhance more appropriate care delivery. This is not always confirmed though, like in the present study. In general, however, higher knowledge levels guarantee greater changes of appropriate childcare[13-14].

When skilled, women with HIV/aids have better chances of overcoming the conditioning factors by guiding their actions in an organized manner, through an active, decisive and conscious attitude. This will enable them to modify the conditions that impede or disqualify their care for their vertically exposed children, based on the correct use of the information gained, through a more critical and reflexive posture[15-16]. Besides care of themselves, they need to readapt their lives in view of requirements for strict and periodical monitoring of their children who have not received a definitive diagnosis of the infection yet. Thus, external and internal aspects of these women's lives can interfere in the level of care excellence. Broader reflexive discussion is needed about care delivery at health services.

In this research, dimension III indicates the mothers' difficulty to prepare and correctly offer formula and complementary feeding to their children. In view of published feeding protocols and recommendations for children exposed to HIV at birth, the lack of preparation and compliance of standardized orientations is highlighted, in order to direct these mothers' appropriate feeding practices for their children.

Few studies have been published in Brazil about feeding practices for children exposed to HIV. Therefore, further research is urgently needed to assess the living conditions of children with HIV, as well as to know the access to and distribution of foods in the public health network and the aspects of the care quality offered to these groups[17]. With a view to greater effectiveness, however, the prevention strategies proposed by public entities, mainly related to health, need to consider the adversities of families living with HIV. It is fundamental to help them in other ways, such as psychosocial and instrumental support[18], beyond the distribution of milk formula during the first six months of life. Further help and monitoring is needed for these children who are at risk of catching the virus.

Women-mothers infected by HIV need to learn to take care of their children and keep up recommendations to contribute to the reduction of Vertical Transmission (VT) rates. It is fundamental to understand the need for orientations and risks resulting from non-adherence to health monitoring.

To guarantee that these women correctly monitor Ministry of Health recommendations for care delivery to the children, professionals need to provide preliminary orientations, compatible with the women's education and income level/economic situation. These interventions can happen during prenatal care or after birth. In addition, a multidisciplinary team needs to be available to guide information-based orientations and clarify dietary adaptations according to the age range.

Further care for these children is urgently needed with a view to appropriate prophylaxis in the intrauterine period, delivery and after birth. Thus, they can be healthy and free from HIV infection, consequently contributing to the drop in perinatal transmission incidence rates in Brazil[19].

In the social and health context, families play a fundamental role in health care delivery to the children, who depend on others to survive. In the family context, mothers serve as providers and are responsible for effective communication with health professionals. They seek better and further assistance and care, with a view to reaching the highest possible health potential[20]. Nevertheless, deficiencies are observed in the mothers' compliance with appropriate care related to food preparation and offering. This care is essential to maintain a balanced health conditions for these children exposed to HIV.

The nurses and other Family health team members need to look for alternatives in the care process at health centers and specialized services, with a view to enhancing the interaction between the team and the mothers. Qualified listening is one of the fundamental ways to find possible turning points in their ways of thinking and acting, besides finding joint solutions that somehow contribute to the acceptance of the HIV infection and its risks, resulting in better care for their children.

## Conclusions

The opportunities lost to intervene preventively and empower mothers to see to their children's health, in the antenatal period, during birth and postpartum, reveal both the organizational weakness and the health professionals' need to disseminate vertical transmission prevention strategies in different healthcare contexts, as well as the need for the decentralization of HIV/aids care to primary car levels.

In view of this reality, health services are responsible for receiving these clients appropriately and for requiring that professionals systematically comply with recommendations, whether through logistic services or training related to the theme. Thus, the intention is to properly orient the mothers with HIV/aids and to turn them into care agents for their children exposed to HIV.

This orientation should allow these women to become protagonists of their own existence, enhancing their autonomy to safely deliver care to their children and themselves, with a view to a better quality of life. This process requires articulation with other aspects of these women's life though, like the family and social context.

The present study results need to be shared with municipal and state health managers to further inform the data collected at care services for children exposed to HIV. Through these results, they can be alerted about the urgent training need related to these children's nutrition. In addition, the decentralization of care services for this more vulnerable population need to be put in practice in different healthcare fields and these clients' access to social benefits needs to be improved, such as transportation aid, basic food packages and milk formula distribution.

As a study limitation, a downward trend in the diagnosis time was observed, due to the fact that most participating mothers were young and had been diagnosed recently, showing the highest frequency levels at all care levels, including low care skills. This observation demands further research to identify other situations that increase the vulnerability of childcare, not only due to maternal factors but also involving gender issues, socio-family support and the integration of Health Care Networks (RAS), with a view to putting in practice public policies through health promotion actions for this population.

Based on this study, it is concluded that it is fundamental to offer high-quality specialized services to monitor the health of children exposed to HI, particularly because this is a risk population. Also, families and mainly mothers need to be sensitized to gain and develop child health skills.

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