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# DEMANDS OF HOME CARE OF CHILDREN BORN EXPOSED TO HIV IN THE PERSPECTIVE OF THE ENVIRONMENTAL THEORY

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## ABSTRACT

The purpose of this study was to identify the demands of home care of children born exposed to HIV in the perspective of the environmental theory. It consists of an exploratory descriptive qualitative study, developed between January and April of 2011. Study participants were ten HIV-infected mothers with infants exposed to the virus, living in Fortaleza, Ceará. The data collection instruments included: a disposable digital camera and forms to obtain information on health associated with the home environment. Results were contextualized according to the theory and organized into the following categories: vulnerabilities associated with the physical structure of the house; contaminated intra and peridomestic air; unclean water used for drinking; sanitation and sewerage system; lighting and ventilation of the house. In conclusion, the home environment offers unfavorable environmental conditions for the child. Targeted interventions in the home environment are necessary so as to promote the health of children born exposed to HIV.

**Descriptors:** Nursing theory. Child health. HIV. Housing. Photography.

## *RESUMO*

*Objetivou-se identificar as demandas de cuidado domiciliar da criança nascida exposta ao HIV, sob a perspectiva da teoria ambientalista. Trata-se de estudo qualitativo exploratório-descritivo realizado de janeiro a abril de 2011. Participaram dez mães infectadas pelo HIV, com crianças nascidas expostas ao vírus, em Fortaleza, Ceará. Constituíram-se como instrumentos de coleta de dados: câmera fotográfica descartável e digital e formulários para captação de informações em saúde associadas ao ambiente domiciliar. Os resultados foram contextualizados de acordo com a teoria e organizados em categorias: "vulnerabilidades associadas à estrutura física da moradia"; "ar intradomiciliar e peridomiciliar impuro"; "água utilizada para consumo"; "rede de esgoto e saneamento"; "iluminação e ventilação da residência". Conclui-se que o ambiente domiciliar oferece condições ambientais desfavoráveis para a criança. Urge a realização de intervenções focalizadas no ambiente domiciliar, para promover a saúde da criança nascida exposta ao HIV.*

***Descritores:*** *Teoria de enfermagem. Saúde da criança. HIV. Habitação. Fotografia.*
***Título:*** *Demandas de cuidado domiciliar da criança nascida exposta ao HIV na ótica da teoria ambientalista.*

## *RESUMEN*

*Se objetivó identificar las demandas de atención en el hogar de los niños nacidos expuestos al VIH en la perspectiva de la teoría ambientalista. Estudio cualitativo exploratorio-descriptivo realizado entre enero y abril de 2011. Participaron diez madres VIH-positivas con bebés expuestos al virus, en Fortaleza, Ceará. Fueron instrumentos de recolección de datos: cámara desechable y digital y formularios para capturar información sobre la salud asociada con el ambiente del hogar. Los resultados fueron contextualizados de acuerdo a la teoría y organizado en categorías: vulnerabilidades asociadas con la estructura física de la casa; aire intra y peridoméstico impuro; agua utilizada para el consumo; saneamiento y alcantarillado; iluminación y ventilación de la residencia. Se concluye que el hogar ofrece condiciones ambientales desfavorables para el niño. Hay necesidad de intervenciones específicas en el entorno del hogar para promover la salud de los niños nacidos expuestos al VIH.*

***Descriptores:*** *Teoría de enfermería. Salud del niño. VIH. Vivienda. Fotografía.*
***Título:*** *Demandas de cuidados en casa del niño nacido expuesto al VIH en la óptica de la teoría ambientalista.*

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## INTRODUCTION

In order to minimize children's health complications caused by exposure to HIV, it is essential to know their socioeconomic and housing conditions, considering that pauperization is one of the main faces of this epidemic due to the fact that the disease strikes economically active individuals and results in an increase in family expenses (treatment, transportation, funerals, for instance), which may have a negative effect on these children in terms of nutrition, education, health and emotional support[1].

These conditions often culminate in home insalubrities allied to the precarious access to water, sanitation and hygiene practices. These situations may implicate in a greater vulnerability of children born exposed to the virus towards health complications, such as diarrhea, respiratory or opportunistic infections, allergies, parasitic worms and dermatological problems, among others[2].

Hence, the place where families and children live may evidence determining situations of vulnerability to the health-disease process, both for the children and the families[3].

This reality indicates the need to take care of the children and their families in a holistic manner, considering not only biological aspects and the treatment of the disease, but, especially, their social and environmental surroundings.

Florence Nightingale stands out as a pioneer in the identification of the influence of environmental factors in the health-disease process with the formulation of the Environmental Theory, described in 1859. According to the Nightingale, in order to be healthy, the home must provide minimal conditions, such as: pure air, efficient sewerage system, hygiene and lighting. Home insalubrities would be proportional to the degree of deficiency of these factors[4].

Still according to this theory, the control of the environment consists in maintaining conditions, such as: airing and heating of the internal air; absence of noise; lighting; and hygiene of the floor, walls, furniture, clothes and objects. It emphasizes essential questions to assure a healthy home and, consequently, minimize health complications[4].

The application of the Environmental Theory will contribute to the historical recovery of the theory, while also allowing to visualize the evolution of the elements highlighted by Nightingale in the current home and health settings. In addition, it contemplates the gap in literature regarding the application of the environmental theory in home settings.

In light of these circumstances, a gap of information remains, in the state and national scope, regarding socioeconomic and housing conditions of children born exposed to the virus, allied to the frailty of health services involved in providing comprehensive care to these children and their families, implicating in greater susceptibility to situations of morbimortality[5].

Considering that the care provided at home becomes an extension of the care indicated in health services, studies with this focus may contribute to establishing proposals of care to children exposed to HIV and their families, based on a broader health concept that comprises issues regarding their socio-environmental surroundings.

Therefore, this study was based on the following question: Does the home environment present risk factors for the development of health complications in children born exposed to HIV? How do these mothers perceive the influence of the environment in the health of these children?

Hence, the aim of this study was to identify the demands of home care for children born exposed to HIV in the perspective of the environmental theory.

## METHOD

This descriptive study was performed with qualitative approach, based on the use of photovoice, a method in which participants take photographs that are subsequently discussed in an interview[6].

The study was developed in the homes of families with children born exposed to HIV, located in the city of Fortaleza-CE, and data were collected in the period between January and April of 2011.

The study participants were ten women with HIV/Aids, mothers of children born exposed to the virus and who were under five years of age. This age was determined due to the susceptibility to complications associated with the physical and social environment in which they are inserted. The number of participants was defined by the

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factors registered through the images, which contemplated the aspects of the environmental theory sufficiently.

Data were collected by means of devices and instruments, which were applied during the development of the study, namely:

a) Disposable camera: used by the mother in order to register vulnerable situations within the domestic and peridomestic environment. These registers were performed with no interference from the researcher. Mothers, as they agreed to participate in the study, received the equipment and guidelines on how to operate it. They also received information about the objectives of this study and were given the freedom to photograph, within their homes, situations which may interfere in their children's health.

b) Environment and health information collection form: a form with the objective of featuring socio-demographic aspects of these subjects, employed by the researcher in the first home visit to these families, when they collected the disposable camera and afterwards printed the photographs. Another form was used to characterize the domestic environment. This form searched for information on aspects regarding the environmentalist theory. All photographs taken were attached to this form and the dialogues between the researcher and these mothers were registered. These dialogues have the objective to promote a context for each photograph and to make a narrative about the situations pictured in the images possible.

c) Digital Camera: it was used by the researcher to capture in better image resolution, the same images in the domestic and peridomestic environment photographed by the mothers.

Participants' photographs and statements were analyzed using the methodological steps regarding photovoice, described as follows[6]:

a) Previous analysis: comprises the visualization process of each photograph allied to the statement produced by participants, in a way to enhance their perspectives and perceptions;

b) Review: interpretations of photographs were established in this phase parting from the researchers' perceptions. Therefore, each photograph was carefully analyzed with its statement with the objective of capturing inconsistencies between what was photographed and what was narrated;

c) Comparison: in this phase, all photographs paired with their respective statements were gathered, interpreted, compared and categorized; and

d) Building the theory: comprised by the photographs and statements analysis through the view of Nightingale's environmentalist theory and the pertinent healthy housing literature.

After the analysis, the following categories were created: vulnerabilities associated with the physical structure of the house; contaminated intra and peridomestic air; unclean water used for drinking; sanitation and sewerage system; lighting and ventilation of the house.

This present study was approved by the Research Ethics Committee of the Federal University of Ceará, under protocol 136/10, and followed all ethical principles in Resolution 196/96. In order to preserve anonymity, participants (mothers) were identified by the letter "E" for interviewee in Portuguese, followed by the Arabic number according to the order in which the interviews took place.

## RESULTS

Mothers infected with HIV were young women aged between 18 and 34 years. Most women were housewives, demonstrating full dedication to child and home care. Education varied between 8 to 14 years of school. Government benefit (Program of Transfer to Poor Families) was received by seven participants. The number of family members living within the same home varied between 3 and 10 people. Income per capita varied between R$ 33.00 to R$ 270.00. Regarding children born exposed to HIV, their age varied between three and thirty five months, eight males and four females, nine nonreactive to HIV, and one with non-conclusive test results.

Regarding housing characterization, half participants owned their houses. Compound and improvised housing were observed in two families.

Except for one house, water service was observed to be received from public services, with at least one tap in the kitchen. Four houses had a laundy room, although there were minimum natural lighting and ventilation. All houses presented a reduced number of windows since they shared walls with other houses.

All houses had drinkable water, electric energy and public garbage collection. Roofs were made of ceramic and had no ceiling. All houses had cement floor. Two houses were near factories (fireworks and chestnut processing) and received smoke produced by the industries. There were smokers in three houses.

Factors associated with Florence Nightingale's environmentalist theory are presented as follows along with the categories established by statements given by mothers resulting from the photovoice technique. In order to illustrate, one photograph was chosen to picture each category (Chart 1).

## DISCUSSION

Many risks associated with the physical structure of the house and its influence on the children's health were observed. Therefore, houses must be clean, well cared for, safe and

**Chart 1** – Categories, photographs of the houses and the statements of mothers with HIV with children born exposed to HIV, about the domestic and peridomestic environment. Fortaleza, CE, 2011.

| Category | Statement |
|---|---|
| Vulnerabilities associated with the physical structure of the house | *[…] I believe these walls are damaging for his health, because it has the smell of mold and he is allergic […]. (E1)*<br><br>*...His bedroom, when it rains gets wet, humid and mold appears that can cause bronchitis and asthma. The dark room with no windows, I believe is a problem for him, causing colds […]. (E4)*<br><br>*This is not appropriate for him, because there are many holes, the floor is broken and the wall is leaking [...] I think we needed a cleaner environment, a little more cozy and neat […] I think an environment like this can result in more bacteria and diseases[…]. (E8)* |
| Contaminated intra and peridomestic air | *This way [referring to the dark backyard with no floor coverage], I think there is a lot of germs, bacteria, these things. It is humid, and there is also the cesspit […] I believe it can bring some diseases to him, since the cesspit has no vent, sometimes we can smell the bad odor, I think this is not good for his health. (E1)*<br><br>*The backyard is a good place for him to play, but this one is not good because the cesspit releases an odor [...]. (E8)* |
| Unclean water used for drinking | *The water from the well disturbs me, it is terrible, there are snakes and toads, and we could almost die by parasitic worm crisis. He doesn't drink the water from there because my husband brings home water from his job, I boil the water. (E6)*<br><br>*He drinks mineral water, we drink normal water [not treated]. (E8)* |
| Sanitation and sewage system | *We have no sanitation, there is the odor, garbage, mosquitoes. We have no sanitation, the water goes straight to the street. (E6)*<br><br>*In front, there is a mud pool, we have local basic sanitation in our house, but the sewage runs here because the neighbors did not finish their drains… We even have had snakes here. (E10)* |
| Lighting and ventilation of the house | *The bedroom is closed, hot and dark. If there was a window, it would be better […] Since there is no window, it is hotter. If there was a window, it would be better, right! (E7)*<br><br>*The window is near her cradle, there is a lot of sunlight on her cradle, she cannot stay there […] It is very hot here, there is almost no ventilation. We must place a piece of cloth on the gate so that it is not so hot for her. (E9)* |

comfortable in order to promote health to children and their families.

As indicated in this study, the main risks associated with the domestic environment are: allergies, respiratory infections, domestic accidents, asthma, diarrhea, parasitic worm, dengue fever and other diseases transmitted by rodents and insects. Most risk situations indicated by mothers are confirmed by literature[2], demonstrating the rich popular knowledge and mothers' life experience. In order to implement health promoting actions, professionals must value popular knowledge and include it in their educational practices, since it is essential to learn about others' point of view, interact and rebuild daily practices and knowledge collectively[7].

Therefore, special attention to domestic conditions must be given while they stand as health determinants. Unhealthy housing may trigger problems such as asthma and respiratory infections, in addition to problems that trigger children birth-morbidity cycle[8].

Health professionals must, above all, value popular knowledge and mothers' life experience in implementing dialogic guidelines associated with the domestic scenario. In addition, apart from keeping mothers connected to their own routines, they are able to make their own choices in improving their quality of life[9]. Home visitation to these families favors a broad knowledge to professionals about their life conditions and their clients' environment[10].

Regarding the contaminated intra and peridomestic air category, it was observed that in the environmental theory, air purity is measured by the contact of the house with the air from the external atmosphere. Back in Florence Nightingale's time, atmospheric air was considered pure because there was no influence of industrialization and toxic compounds as it is currently commonly seen due to pollution, for instance, carbon dioxide. She was influenced by the Miasma Theory that held the origin of diseases is present in the 'bad air'. Hence, this theory element requires an adjustment to current concepts and conditions[4].

Intra and peridomestic air quality is rather important in the cases of children born exposed to HIV, since respiratory pathologies (pneumonia and tuberculosis) for this public is more frequent, mainly due to immunologic vulnerability. Due to opportunistic diseases, the use of prophylactic medication is essential for health maintenance, in face of immunologic damage effects and the elevated risk of bacteria, fungal, parasitical and viral infections. Prophylaxis has the objective to, mainly, prevent pneumonia, a frequent occurrence in HIV positive subjects that may rapidly appear with high lethality[11].

In addition to the influence of the environment, respiratory infections in children exposed to the virus may also occur in their intra domestic environment due to the transmission of diseases originated from the close contact to non-treated infected patients, their parents. Acute infections of the respiratory system are the main causes of children mortality in the world, affecting children under the age of five years, mainly within underdeveloped countries. They are the cause for most child hospitalizations[12].

Pollutants present in the house air, mainly in industrialized countries, may damage the health of babies, since they spend most of their time within the same environment. Infant health may be affected by long-term exposure to $NO_2$, formaldehyde and black smoke[13].

Another risk associated with the intra and peridomestic quality of air found in this research was the emission of hydrogen sulphide gas by the cesspit tank. Inhaling this gas may cause discomfort, in addition to damaging the health of individuals exposed to the gas on a long-term basis, since it is irritating, toxic and inflammable, triggering alterations in the nervous system, ocular mucosa, gastrointestinal (nauseas, vomits) and respiratory irritation (coughing, expectoration, bronco spasms). Moreover, it consists of air pollution and may cause psychological stress and alter the mood of people who inhale it, including children[14]. In face of the impossibility to avoid the exposition to this gas, mothers must be guided to limit children's close contact to the originating source.

Regarding drinking water, literature confirms that proper handling and storage are essential for keeping the health of individuals in general, especially HIV carriers. The reason is that water is a chemical and pathogen agent transmission vehicle. These agents cause diseases such as diarrhea, cholera, dengue fever, yellow fever, trachoma, hepatitis, conjunctivitis, poliomyelitis, scabies, leptospirosis, typhoid fever, schistosomiasis, and malaria[15].

Surveillance on water quality is essential to prevent human health risks. It is confirmed that 30% of gastrointestinal diseases can be avoided by the consumption of treated water[2].

Florence Nightingale emphasizes in her theory that the use of contaminated water increases the risks of transmitting "contagious diseases". Although these diseases had not been denominated in the environmental theory, we may infer that it referred to the common infections at that time, as the typhoid fever[4].

In the homes investigated in this present study, we identified the consumption of mineral water for the children. As literature confirms, drinkability of water is not guaranteed only by its treatment. Storage conditions must be observed, along with distribution and consumption. Bottled mineral water may present low quality and trigger contamination risks by *Escherichia Coli* and total coli forms, hepatitis, cholera and gastrointestinal diseases transmitting vehicles. Therefore, special care must be implemented in handling and storaging this type of water[16].

Lighting and ventilation of the house, although difficult to analyze, were presented in the photographs along with the mothers' statements. Natural lighting and ventilation are essential for thermal comfort - the exchange of heat between the individual and the environment with no great efforts[17]. Nightingale points out that a house with reduced lighting and ventilation is a source of damages to the health of the people living in it, since it is not comfortable, unhealthy, badly aired and dirty[4].

In this present research, high temperature within houses stands out due to a restricted number of windows to promote appropriate ventilation. Such conditions meet Nightingale's recommendations, since they affirm windows must be open in order to make way for the entrance of sunlight and ventilation[4].

Specific effects of overheating are not totally explained in literature, however, inappropriate intradomestic ventilation is well known to cause not only discomfort, but also to enhance the eclosion of transitory symptoms that characterize the "Sick Building Syndrome", represented by irritation, itching, coughing, sore throat, dizziness, nauseas, vomits, headaches, among other symptoms[17].

Adjusting these two methods require intersectorial measures and public policies aimed at housing plans. Facing the difficulties in following this measure, since houses are already built, it is recommended that at least for one hour per day, doors and windows are kept open in order to allow the entrance of solar radiation and natural sunlight. Moreover, the use of fans is recommended[17]. Another measure is the use of clothing appropriate to the climate. However, it is important to avoid keeping children undressed at all times, in order to avoid dermatological infections.

The sewage and sanitation network associated with inappropriate garbage storage stands out since the open air sewage is a peridomestic risk factor. The absence of basic sanitation is a condition that favors the occurrence of parasitosis, mainly in children, in addition to building risk factors to dengue fever vector proliferation[18]. In the Florence's environmental theory the swage is affirmed to spread epidemic and endemic diseases[4].

In this present research, the absence of sanitation exhaust or appropriate destination for human waste is associated only with the peridomestic environment, since all houses had septic cesspits. When there is the absence of sanitation exhaust, risks are increased, and if associated with bad hygiene conditions, they may trigger many enteroparasitosis episodes (hookworm, ascariasis, amoebic dysentery, cholera, infectious diarrhea, bacillary dysentery, schistosomiasis, strongyloidiasis, typhoid fever, taeniasis, and cysticercosis). Within the HIV context, the appropriate elimination of waste may reduce the risk of diarrhea in 30%[19].

Therefore, simple strategies could avoid the eclosion of enteroparasitosis. Fruits and vegetables must be carefully washed, hands must be washed before eating and after the elimination of waste, the sanitary device must be used, and water must be treated for consumption.

## CONCLUSION

Unfavorable environmental conditions for the health of children born exposed to HIV characterization was possible, including regarding those that can be changed by means of using simple resources that do not require great financial investment.

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The photovoice resource is considered as essential to clarifying ideas and opinions, mainly regarding clients that present difficulties in expressing their opinions. These photographs served as a guide for their verbal expression, as a way to organize opinions, illustrate and exemplify them.

Housing condition analysis and the search for risky situations for the health of children interrelated are issues that are often neglected by health professionals, the media and even by the local community. Therefore, the use of photographs is expanding in health researches.

Congruently, the approach performed within the domestic scenario allowed for indentifying aspects of families' life reality with children born exposed to HIV, in addition to demonstrate common housing aspects in the investigated homes. This research sought to offer resources for professionals providing care for children born exposed to the virus, so they can include guidelines aimed at the adjustment of domestic conditions in their work, with a view to preventing health illness events.

Failure to implement more specific parameters and objectives to evaluate ventilation, lighting, water and sewage quality stands out as a fragile aspect of this study. Further studies should include these parameters and the search for more accurate evidence must be sought in order to present the environment as the result of health illnesses eclosion for children born exposed to the virus by using distinct scientific approaches and methodologies.

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