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## INTEGRATIVE REVIEW ARTICLE

### NURSING CARE TO THE CHILD WITH HYDROCEPHALUS: AN INTEGRATIVE REVIEW

#### ASSISTÊNCIA DE ENFERMAGEM À CRIANÇA COM HIDROCEFALIA: REVISÃO INTEGRATIVA ASISTENCIA DE ENFERMERÍA AL NIÑO CON HIDROCEFALIA: REVISIÓN INTEGRADORA

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#### ABSTRACT

**Objective:** to identify studies in the scientific literature related to children with hydrocephalus. **Method:** integrative review, with research in the databases SCIELO, LILACS and MEDLINE, conducted from February to April 2011, using the descriptors nursing, hydrocephalus, child, neurosurgery and nursing care. The sample resulted in 15 articles, which had their results descriptively summarized and discussed. **Results:** through articles analyzed, it was realized the importance of understanding the hydrocephalus to nursing practice, covering aspects that go beyond the social factors. Considering the prolonged hospitalization and significant number of complications, we see the need for a direction of nursing care to neurosurgical patients. In identifying the nursing problems related to the child with the disease, pressure ulcers, neurogênica bladder, and the use of invasive path ways and pain are the most evident. **Conclusion:** in the care provided to patients with hydrocephalus, the professional must be supported scientifically to plan effective interventions that meet the real needs of the child. **Descriptors:** Nursing; Hydrocephalus; Child; Neurosurgery; Nursing Care.

#### RESUMO

**Objetivo:** identificar na literatura científica estudos relacionados à criança portadora de hidrocefalia. **Método:** revisão integrativa, com pesquisa nas bases de dados SCIELO, LILACS e MEDLINE, realizada no período de fevereiro a abril de 2011, utilizando-se os descritores enfermagem, hidrocefalia, criança, neurocirurgia e cuidados de enfermagem. A amostra resultou em 15 artigos, os quais tiveram seus resultados sintetizados descritivamente e discutidos. **Resultados:** percebeu-se a importância da compreensão da hidrocefalia para a prática da enfermagem, contemplando aspectos que vão além dos fatores sociais. Levando em consideração o tempo prolongado de internação e o número significativo de complicações, há necessidade de um direcionamento dos cuidados de enfermagem ao paciente neurocirúrgico. **Conclusão:** na assistência prestada ao paciente portador de hidrocefalia, o profissional deve estar embasado cientificamente para programar as intervenções eficazes, que atendam às necessidades reais da criança. **Descritores:** Enfermagem; Hidrocefalia; Criança; Neurocirurgia; Cuidados de Enfermagem.

#### RESUMEN

**Objetivo:** identificar en la literatura científica estudios relacionados al niño portador de hidrocefalia. **Método:** revisión integradora, con investigación en las bases de datos SCIELO, LILACS y MEDLINE, realizada en el periodo de febrero a abril de 2011, utilizando los descriptores enfermería, hidrocefalia, niño, neurocirugía y cuidados de enfermería. La muestra resultó en 15 artículos, los cuales tuvieron sus resultados sintetizados descriptivamente y discutidos. **Resultados:** a través de los artículos analizados se percibe la importancia de la comprensión de la hidrocefalia para la práctica de la enfermería, contemplando aspectos que van más allá de los factores sociales. Teniendo en cuenta el tiempo prolongado de internación y el número significativo de complicaciones, se percibe la necesidad de un direccionamiento de los cuidados de enfermería al paciente neuroquirúrgico. En la identificación de los problemas de enfermería relacionados al niño portador de la enfermedad, la úlcera por presión, la vejiga neurogênica, el uso de vías invasivas y el dolor fueron los más evidenciados. **Conclusión:** en la asistencia prestada al paciente portador de hidrocefalia, el profesional debe tener base científica para programar las intervenciones eficaces, que atiendan las necesidades reales del niño. **Descriptores:** Enfermería; Hidrocefalia; Niño; Neurocirugía; Cuidados de Enfermería.

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## INTRODUCTION

The hydrocephalus, also known as ventriculomegaly, happens as a result of dilation of the brain ventricles, whether due to the increased volume of cerebrospinal fluid (CSF), or the brain blood volume and the brain parenchymal arising from edema and injuries. The increased CSF expands the ventricles and compresses of the brain toward the cranial bones. This dilation causes potentially harmful pressure on the brain tissues, which can greatly enhance the morbidity and mortality of patient.<sup>1-4</sup>

At birth, most hydrocephalic children appear to be normal. Signs and symptoms only appear at the age of two years or older. If the increase of the intracranial pressure is abrupt, the clinical picture is characterized by headache, nausea, vomiting, visual changes, and decreased level of awareness.<sup>2</sup>

When chronic, the disease at stake produces sequelae, and these may appear together. Generally, there is an increase in the volume of the head, face with abnormal appearance, exophthalmos and prominence of sclera, impairment in social relationships regarding the physical, cognitive, emotional levels, as well as on the overall development, besides limiting physical functions or activities. Furthermore, it can also cause a progressive visual loss and optic atrophy, strabismus and nystagmus.<sup>5</sup>

The epidemiological characteristics and distribution of the several types of hydrocephalus vary according to the geographical and social differences. The true incidence of the childhood hydrocephalus is hard to access, since there is prevalence in different geographical areas, furthermore, due to the differences in defining the etiology and due to the inclusion/exclusion criteria.<sup>6</sup>

The nursing practice is based on scientific principles that provide effective identification of actual and potential health problems, as well as the development of actions aimed at maintaining the life quality of the individual. Nursing should be trained, technically and scientifically, to care for the patient with hydrocephalus, which requires knowledge of neuroanatomy, neurophysiology, neurological clinical pictures, neurodiagnoses and nursing exams, intensive care and admission unit.<sup>4,7</sup>

With regard to the clinical practice together with children with hydrocephalus, it is possible to realize the commitment of nurses. However, the nursing interventions do not follow systematization or even logic based on specific nursing features.<sup>8</sup>

For obtaining knowledge about hydrocephalus, which requires careful examination, specialized treatment and monitoring, we have used the integrative literature review, which is an important tool to enhance and drive nursing care provided to patients, based on scientific knowledge.<sup>9</sup>

Based on the aforementioned, it is believed that this study will contribute to the nursing care to the children with hydrocephalus, from the evidence available in the literature about the knowledge already produced about the issue in question, besides expanding the research gamut that involves such an issue.

## OBJECTIVE

- To identify studies related to children with hydrocephalus in the scientific literature.

## METHOD

This is an integrative literature review, due to it being a research technique that gathers and synthesizes the scientific knowledge produced, through the analysis of the results previously evidenced in studies of specialized authors.<sup>10</sup>

To guide the integrative review, we have formulated the following question << ***What is the scientific evidence on the nursing interventions in childhood hydrocephalus?*** >>

The LILACS (Latin American and Caribbean Health Sciences), SciELO (Scientific Electronic Library Online) and MEDLINE (Medical Literature Analysis and Retrieval System Online) databases were consulted, with the following inclusion criteria: studies that addressed the issue on childhood hydrocephalus, published from 2003 to 2011, with summaries available and accessed in their full version, in Portuguese, English and Spanish.

The descriptors were selected from the Virtual Health Library - *Descritores em Ciências da Saúde (DECS): enfermagem, hidrocefalia, criança, neurocirurgia e cuidados de enfermagem*. The same descriptors were obtained for the MEDLINE database by means of the Medical Subject Headings (MESH): nursing, hydrocephalus, child, neurosurgery and nursing care. The survey of publications was held from February to April 2011.

For data collection, a previously validated form was used, by involving methodology, objectives and publication year, which was completed for each selected paper. The use of the research form allowed us to obtain detailed information about the papers, in

order to choose the ones that best suited to our proposed objective.<sup>11</sup> For the analysis of the evidence level, we have used the concepts proposed by researchers of the nursing field.<sup>10</sup>

The presentation of results and discussion took place in a descriptive way, allowing the reader to assess the applicability of the designed integrative review, in order to provide evidence for the nursing practice.

RESULTS

We have identified 106 papers in the SCIELO database. However, after analysis, it was observed that only seven were suitable to the inclusion criteria. In the LILACS database, 162 papers were found, where 50 had hydrocephalus as the main issue, but only four met the inclusion criteria. In the MEDLINE database, 267 articles were located, among

which, after a careful analysis, it was verified that four answered to the objective study. Thus, the final sample of this integrative review was comprised of 15 papers.

Regarding the evidence level, one paper has presented a strong evidence level (level II), eight papers have showed moderate evidence levels (levels III and IV) and six papers have presented weak evidence (levels V and VI).<sup>10</sup>

Aiming at a better understanding, the papers were distributed in three frameworks, according to the source language, addressing the study type, objectives and publication year. Figure 1 illustrates the papers included in the study in Portuguese language, performing a total of 11 papers.

Study type	Objectives	Year
Case report <sup>1</sup>	To analyze the influence of physiotherapy in neuropsychomotor neurodevelopment of a patient with hydrocephalus.	2009
Qualitative study <sup>5</sup>	To understand the family's experience in living with hydrocephalic child's situation; to identify the provoked changes in family life; to analyze coping mechanisms.	2009
Cross-sectional and quantitative study <sup>7</sup>	To identify nursing problems of children with hydrocephalus and myelomeningocele in use of ventricular derivations.	2011
Descriptive and exploratory study <sup>8</sup>	To identify information sources of caregivers and to check their knowledge on the hydrocephalus.	2010
Relato de caso <sup>12</sup>	To bring important measures with regard to the conduct of Nursing to the patient affected by hydrocephalus.	2010
Retrospective study <sup>13</sup>	To analyze the epidemiological and clinical characteristics; to identify the factors related to the psychomotor disturbances, epilepsy and death.	2005
Retrospective study <sup>14</sup>	To analyze and to identify the factors that lead to the increased incidence of hydrocephalus.	2003
Quantitative study <sup>15</sup>	To characterize the presence of possible clinical pictures of genetic etiology among people with not previously clarified congenital hydrocephalus and to confirm those with previously identified etiology.	2004
Prospective cohort study <sup>16</sup>	To know the incidence of pressure ulcers in the pre and post-operative of neurosurgical patients and to describe the preventive measures implemented by the nursing staff during these periods.	2009
Qualitative study <sup>17</sup>	To understand and to analyze the representations and needs of schoolchildren, bearers of neurogenic bladder, and their mothers.	2003
Literature review <sup>18</sup>	To describe data related to the pain assessment and nursing care to patients with pain.	2005

Figure 1. Presentation of the synthesis of papers in Portuguese included in the integrative review. Feb./Apr., 2011.

We have identified two papers in the English language, described in the following figure.

Study type	Objectives	Year
Systematic review <sup>3</sup>	To enhance the definition and classification of the hydrocephalus for the development of an international consensus on its nomenclature.	2008
Retrospective study <sup>6</sup>	To check whether recent advances in the diagnosis and management of the hydrocephalus, as well as changes in epidemiology have significant impact on the everyday clinical practice.	2009

Figure 2. Presentation of the synthesis of papers in English included in the integrative review. Feb./Apr., 2011.

We have also identified, in this review, papers in the Spanish language, totaling two works, which are shown in Figure 3.

Study type	Objectives	Year
Systematic review <sup>2</sup>	To conceptualize the childhood and/or adult hydrocephalus, by highlighting diagnosis forms and disease treatment.	2011
Systematic review <sup>4</sup>	To develop the implications and nursing care which should be taken to control secondary intracranial pressure to the hydrocephalus.	2007

Figure 3 Presentation of the synthesis of papers in Spanish included in the integrative review. Feb./Apr., 2011.

DISCUSSION

From the analyzed papers, it should be realized the importance of understanding the hydrocephalus for the nursing practice, by covering aspects that go beyond the social factors. In order to improve the research in this area and, consequently, to generate more effective treatments, it is essential to define and to classify, clearly, such a disease.<sup>3</sup>

The hydrocephalus is characterized by etiological heterogeneity.<sup>5</sup> Some etiological factors, such as cancers and CNS malformations, influence over the morbidity resulting from this disease. Infectious complications, such as meningitis, are directly related to the mortality in children with hydrocephalus.<sup>13</sup> This etiological diversity shows the importance of the clinical/dysmorphic assessment as an additional tool in the disease diagnosis. Thus, it becomes possible to perform a proper genetic counseling for the parents and other interested family members.<sup>15</sup>

Regarding the incidence of the disease, it was accentuated after 1992.<sup>14</sup> Nonetheless, its incidence has been decreasing along with the decrease in the incidence of congenital malformations, despite still having an impact across the world.<sup>6</sup>

From this viewpoint, it is crucial that the multidisciplinary team holds the knowledge on the development of hydrocephalus, by contributing to a more targeted treatment concerning the patient and reducing the possible complications arising from such a disease.

Regarding the treatment, technological advances have positively contributed to the survival and life quality of children bearers of such a disease. The sequels showed by patients after treatment, especially the delay of the neuropsychomotor development, are limiting factors for the child's strengths and frequent contributors of family and social mismatches.<sup>7</sup>

It is important having a multidisciplinary performance in caring of this clientele, and it is evident the influence of the physiotherapy in the neuropsychomotor development,

coupled with the intrinsic development of the child, and in the improvement of the child for acquiring functional skills.<sup>1</sup>

The Nursing seeks to develop own knowledge, in order to systematize and to organize its practice and care, thus favoring the holistic assistance.<sup>12</sup> Nursing care should occur not only in the neuroanesthetic and neurosurgical processes, but globally.<sup>8</sup>

In this context, it should be cited the insertion of the patient's family in the treatment process, since the disease significantly affects the family dynamics.

It is necessary to draw up a care plan that addresses the hydrocephalic child's needs. Nursing, when thinking about the care process, should focuses on the biopsychosocial, cultural and spiritual aspects.<sup>12</sup>

Despite the importance of clinical treatment, this should be complementary to surgical treatment. The use of the External Ventricular Drainage (EVD) and the Ventricular Peritoneal Derivation (VPD) decreases the late hydrocephalus effects, but can cause neurological damages, in addition to the suffering for the patient and its family.<sup>2</sup>

Taking into account the long length of stay and the significant number of complications, one realizes the need for rerouting the nursing care to the neurosurgical patient. Surgical treatment can bring some nursing problems, such as the onset of pressure ulcers, neurogenic bladder, infection risk and acute pain.<sup>4,18</sup>

The pressure ulcers (PU) can be described as any lesion caused by unrelieved pressure which results in damages to adjacent tissues. The more effective nursing interventions for the UP prevention are: pressure control on the body areas, to take care of the incision locations, to supervise the skin and to control the infection and nutrition.<sup>16</sup>

The neurogenic bladder is a designation that is given to the secondary bladder dysfunction to nervous system impairment. Its most common complication is the urinary infection and the more severe is the kidney deterioration. It is a complication that requires from the nursing professional a



specific knowledge of the anatomy and physiology of the urinary system for performing a proper care. The nursing intervention would be the vesicle catheterization, care at the urinary incontinence and in the urinary retention.<sup>7,17</sup>

In case of infection risk related to invasive procedures, the nurse should control the infection, to care of injuries, catheters, probes and drains and the environment, besides to monitor the vital signs.<sup>4</sup>

As regards the presence of acute pain related to invasive procedures, a previous study has raised the nursing interventions that may be used, among them: the performance of a comprehensive survey of pain (location, characteristics, frequency, intensity); to ensure accurate care of analgesia; to determine the impact of pain on the life quality; to offer information about pain; to control the environmental factors that can influence the patient's answer to the discomfort; to reduce or to eliminate factors that precipitate or increase the pain; to select and to implement a variety of measures for facilitating the patient's relief; to promote an adequate rest/sleep and to monitor patient's satisfaction with pain control, at specific intervals.<sup>18</sup>

The work of empowering mothers so they can assess their children is another important measure in the nursing conduct. Thus, the care is not restricted to the healthcare professionals, by starting to be held in its entirety and contributing to the development of the mother-child bond.<sup>12</sup>

There are several nursing problems related to the complications associated with ventricular derivations, such as: decreased intracranial adaptive capacity, related to the increased ICP; risk for impaired skin integrity, related to the immobility and/or frequent exposure to fecal/urinary discharge and the urinary incontinence, which is related to the neurogenic bladder.<sup>7</sup>

The complexity of the hydrocephalus brings about major repercussions from a social standpoint. The symptomatology and sequelae of this disease generate negative feelings in the family and in the affected child itself. This last one is able to receive and to realize love, encouragement, goodwill expressions, investment in its skills, social interaction, like any other child. So, the family can rescue what was envisioned in pregnancy.<sup>5</sup>

With the growing recognition of the importance of the clinical reasoning for the nursing practice, it is possible to perceive the care process promoted by the nursing staff in

the clinical practice with hydrocephalic children.

## CONCLUSION

The hydrocephalus is among the most important and frequent neurosurgical diseases, due to its clinical, surgical and social implications; they are arising from diverse etiology, which is associated with functional and neuropsychiatric abnormalities attributed to various disorders in the brain regions, besides to constitute a major cause of deaths.

The technological advance for the supportive treatment of the hydrocephalus has made considerable progress in improving the life quality of children. Even though, it is a hard task to take care of a hydrocephalic child, both for the family and for the healthcare professional. An essential aspect in the care of these children is their integration into society.

Regarding the pursuit of nursing problems related to the child with the disease in question, the PU, the neurogenic bladder, infection risk and pain were the most evidenced, requiring from the nursing professional the technical and scientific domain for early identification and intervention, regardless of the type of therapeutic intervention and clinical manifestations verified in the occurrence of eventual complications. For this purpose, the practitioner must be scientifically supported to implement the effective interventions and that meet the actual needs of the sick child.

The nursing professional is a vital and active part of the multidisciplinary team, both in the care during the clinical/surgical procedures and in the guidance and strengthening of the bond of the child with its family.

The nurse plays an active role in preventing and solving the raised problems, therefore, it is necessary to have knowledge of the neurological function, signs and symptoms of the disease and its treatment, by seeking the best life quality for the hydrocephalic child

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