

# Implementing a hospital-based animal therapy program for children with cancer: A descriptive study

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## Abstract

*Children living with cancer must cope with the disease, frequent hospitalizations, aggressive treatments and numerous treatment side effects. Combined, these stressors can lead to adverse biopsychosocial effects. An animal therapy program called "A Magical Dream" was instituted for children hospitalized in pediatric oncology to promote their well-being during hospitalization and facilitate their adaptation to the therapeutic process. The main goal of this preliminary study was to complete a descriptive assessment of the program implementation using Donabedian's quality model. This study aims more specifically at documenting the observed connection between participating in the program, quality of care and satisfaction of participating parents and nurses.*

*A total of 16 parents of children and 12 nurses took part in the implementation study and composed the sample. Data were collected through two self-administered questionnaires intended for parents and one questionnaire for nurses. Evaluating the quality of the animal therapy program includes issues related to user profiles, animal therapy intervention process, organizational structure and client outcomes. It appears that dog-assisted therapy may contribute to alleviate psychological distress in children and parents, facilitate their adaptation to the therapeutic process, and promote their well-being while hospitalized. The goal of a second phase to the project will be to verify the effectiveness of the animal therapy intervention by targeting more specifically children hospitalized with solid tumours.*

In Canada, more than 1,200 cancer diagnoses are reported each year for children aged 0 to 19 (National Cancer Institute of Canada, 2000), making this disease the second leading cause of death in the five to 19 age group (Health Canada, 1996). These children must cope with the disease, frequent hospitalizations, aggressive treatments and numerous treatment side effects (pain, nausea, vomiting and loss of appetite). Combined, these stressors can lead to adverse biopsychosocial effects.

In particular, hospitalized children can display psychological distress. For them, distress is often synonymous with expressions of anxiety and irritability or depressive symptoms (Enskar, Carlsson, Hamrin, & Kreuger, 1997; Sheldon, 1997; van Dongen-Melman & Sanders-Woudstra, 1986). This distress may contribute to increasing treatment side effects and even interfere with the conduct of the treatments. Moreover, the distress of hospitalized children is often accompanied by inefficient coping strategies such as cognitive and behavioral avoidance that can help augment the child's coping problem with the disease, treatments and hospital setting. Also, the children's distress can have an impact on the distress felt by family members and caregivers.

It was the distress observed in some hospitalized children and their families and the powerlessness of the caregivers working with them that gave birth to "A Magical Dream", an animal-assisted therapy pilot project at the CHUQ (Quebec City University Hospital Centre).

Stemming from a nursing initiative started in 1999, this project aims to promote the well-being of children living with cancer during their hospitalization, reduce their emotional distress and facilitate their adaptation to the therapeutic (psychological, physical and social) process by promoting the emergence of special bonds between children and animals. The animal therapy program at CHUQ allows children accompanied by a parent to spend a whole day with a dog while being hospitalized in a room that is safe, warm and family friendly (Landry et al., 2000). In addition to facilitating the child's adaptation, this initiative may contribute to improving the quality of care, especially by offering a service for which client outcomes have already been noted (refreshing rest, better nourishment, physical exercise, socialization, participation in recreational activities, verbalization of fears and concerns, feeling less anxious, happier, etc.).

Animal therapy is defined as a clinical method aiming to promote the natural and healing bonds that exist between humans and animals, both for preventive and therapeutic reasons (Daoust, 1987). The rationale behind this practice is that animals naturally stimulate an attraction and involvement response in humans (Brodie & Biley, 1999), which is then reflected in the person's well-being. As well-being is inconsistent with the state of emotional distress, animal-assisted therapy may be a beneficial intervention to alleviate distress in the child, his family and caregivers.

## The state of knowledge

There has been little empirical documentation of animal therapy's effect on decreasing distress. The rare studies on this topic adopt descriptive designs that suggest that animal-assisted therapy may have beneficial effects (see Brodie and Biley, 1999; Poleshuck, 1997 for a review). The majority of these descriptive studies were completed with very different populations (the elderly or people with mental health problems) than the one in this study (children with cancer) or with animal therapy procedures that cannot be transferred to the hospital setting. Due to their poor internal validity, the results of these studies were excluded from this paper. A few studies do document animal-assisted therapy in the hospital setting and others deal with its application to child populations. Brief summaries of these studies are presented in the following sections.

Some studies document the implementation of animal therapy programs in health care settings. For example, the satisfaction of an adult population with the implementation of such a program in a cardiac care unit was evaluated using five questions (Cole & Gawlinski, 1995). This program involved 120 visits by a dog and its master.

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Patients declared themselves satisfied, stating that the visits made them feel more cheerful, calmer and less lonely. Furthermore, the results of a quasi-experimental study completed with 36 residents at a medical centre, demonstrated a link between a dog's presence and an increase in social interactions (Fick, 1992). A similar relationship was observed in an experimental study with 53 residents at a nursing home (Perelle & Granville, 1998). In the latter, however, one should note that the improved social interactions observed during animal therapy did not last in time. Taken globally, and in spite of the methodological limitations associated with the selected correlational designs, these three studies support the feasibility of implementing an animal therapy program in a medical setting; they also describe the beneficial effects from the standpoint of the emotional state and the social behaviours likely to promote coping in adult populations in a hospital setting.

A few studies on animal therapy with children were found. One of them is an experimental study completed with 12 autistic children attending a specialized centre (Redefer & Goodman, 1989). Participants enjoyed 18 20-minute encounters with a dog and their usual therapist. The results show a decrease in autistic behaviours among participants as well as an increase in appropriate social behaviours. Another study, this time with an exploratory design, was completed with a sample of 12 children facing behavioural problems and learning difficulties (Mallon, 1994b). Both the qualitative and quantitative data obtained suggest that the presence of a dog could be associated with beneficial effects on an emotional, physical and social level. Moreover, the authors think that the benefits of the intervention could outdo the costs. Two other case studies with boys with an emotional disorder describe animal-assisted therapy as an opportunity for the participants to feel more in control and express a sense of pride and accomplishment (Kogan, Granger, Fitchett, Helmer, & Young, 1999). The results of these three studies suggest that pet-assisted therapy with children could have a positive effect on their emotional state and could augment their effective behavioural strategies that in turn facilitate the children's coping.

The survey of the literature identified the only two studies where animal therapy was applied both to a hospital setting and a young population. The first of the studies was of a qualitative nature and described the response of hospitalized adolescents to the presence of a dog on the psychiatric unit (Bardill & Hutchinson, 1997). An ethnographic approach was used to help understand the participants' perspective regarding this experience. The adolescents described the dog as being a part of the setting, but also as a friend and therapist. The animal was also described as a social interaction catalyst and was assigned human qualities such as comforting, friendly and attentive. The dog was favourably welcomed by the adolescents and the psychiatric unit. The second study documented the implementation of a dog-assisted therapy program in a children's hospital in cooperation with veterinary medicine students (Teeter, 1997). The program's objective was to minimize the emotional pain associated with hospitalization in the children and their families by letting them get together in a quiet place to enjoy the company of two or three dogs for about an hour. The author stated that program's efficacy and efficiency will soon be evaluated.

All the results from descriptive and correlational studies support the existence of a positive relationship between animal therapy and an improved emotional state. The interpretation of the data supports the appropriateness of implementing an animal therapy program in the oncology setting in order to facilitate the children's coping with the disease, treatments and hospitalization. For example, for sick children, animal therapy could reduce anxiety and depressive symptoms, break down their isolation and increase social interactions. It could also increase the children's cooperation with treatment and help reduce the physical discomfort associated with painful procedures (Barba, 1995; Brodie & Biley, 1999; Polshuck, 1997; Struck & Brady, 1998). In a hospital context, the animal could be of great assistance thanks to its ability to offer pleasant and affectionate companionship and a sense of

being listened to (Mallon, 1994a). Furthermore, it could help preserve the normalcy of a situation (Brodie & Biley, 1999). Thanks to its warmth and coat, the animal could also be providing a sense of comfort and security (Jonas & Feline, 1981; Mallon 1994b).

According to the Transactional Theory of Stress first suggested by Lazarus and Folkman (1984), several mechanisms could contribute to reducing the children's distress and facilitate their coping with the complex stressor that comprises cancer, its treatments and numerous hospitalizations. By helping to facilitate the children's adaptation to this complex stressor, the implementation of an animal therapy program could also improve compliance with treatments, alleviate symptoms and treatment side effects, and have an impact on the quality of nursing care. This is the reason why this study aims to use Donabedian's model (1980) to evaluate the quality of the animal therapy service provided by the nurses to the clients of CHUQ's pediatric oncology unit.

## Analytical framework

Donabedian's model is often selected for quality assessments (Brunelle, 1993; Haddad, Roberge, & Pineault, 1997). This model includes a trilogy approach that allows quality assessment to be performed according to structure, process or outcomes.

Care and service quality measurement approaches have traditionally targeted structural elements thus allowing one to study organizational and physical aspects as well as specific characteristics of the institution (Donabedian, 1980; Zimmer, 1980). In nursing care, quality evaluation tends to focus on care processes as areas of interest. These processes include all activities taking place between care providers and patients (Laurin, 1988). More recently, the contributions of nursing care to the goals of health recovery, maintenance and improvement and to a serene death were analyzed from the perspective of the results (Morin, 1997). The results evaluation includes both outputs that refer to those results more closely related to service production, and outcomes which refer to changes in the health status (Saucier & Brunelle, 1995).

In this results perspective, we chose the model by Morin (1998) to evaluate the animal therapy pilot project. According to this author, evaluating results is to establish "the relationship between components of the care structures and the objective or subjective benefits for patients, while simultaneously shedding light on some aspects of the care processes that likely induced them" (Morin, 1998, p. 25). This model greatly inspired by Donabedian's trilogy (1980) outlines (Figure One) the links that can be established between the elements of the organizational structure, intervention process and outcomes as experienced by the populations in question, i.e., the patients and their families.

## The study's main objective

Based on Donabedian's framework (1980) and Morin's model (1998) for evaluating results, this paper deals with the descriptive study on the implementation of an animal therapy program in a hospital setting. According to our literature survey, it is the first one to focus specifically on a pediatric oncology population and to let each child spend an entire day in the company of a dog. The main objective of the study is to evaluate the implementation of the animal therapy program "A Magical Dream" by describing the observed link between having participated in the program and the quality of care and the satisfaction of parents and participating nurses.

## Methodology

### Study design and variables

This evaluation study uses a descriptive design to assess the implementation of an animal therapy program in a hospital setting. The animal therapy program constitutes the first variable of interest. It was developed for the CHUQ's pediatric oncology population to promote the well-being of children with cancer while they are

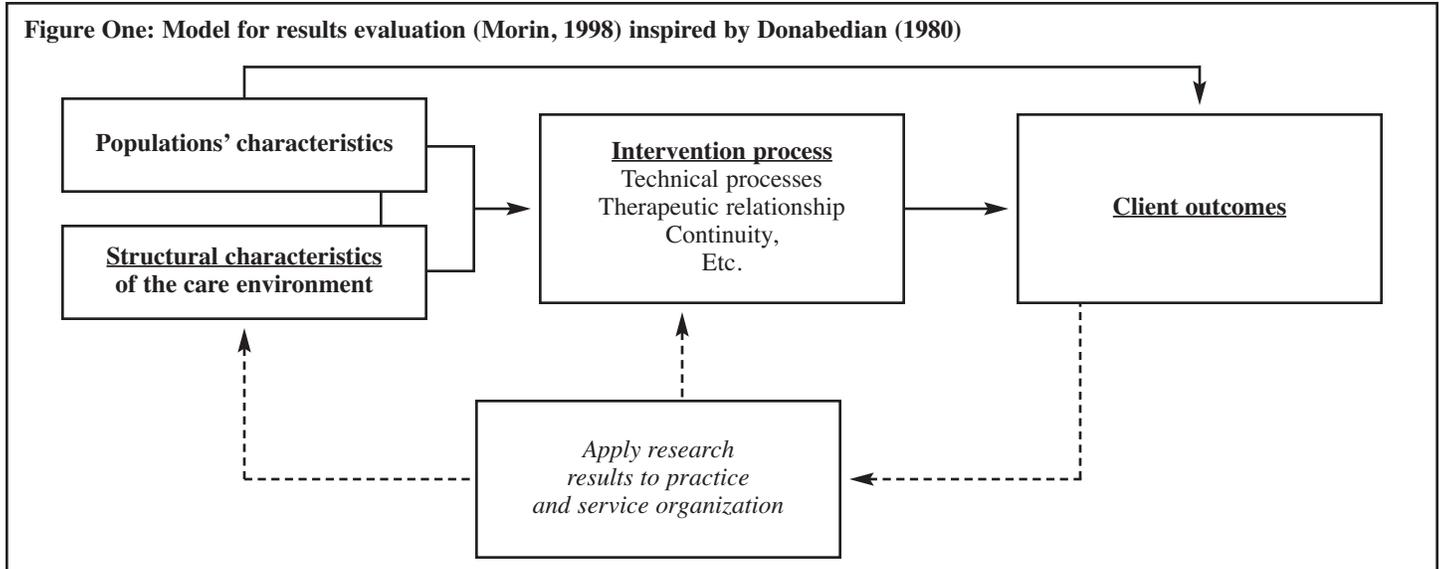
hospitalized. Associated variables consist of elements of satisfaction with the program and of quality of care such as expressing feelings, compliance with treatments, functional independence, rest, nourishment and physical exercise and participation in recreational activities.

**Population and sample**

The population under study was composed of parents of children with cancer hospitalized at the CHUQ on one hand, and nurses working with these clients on the other hand. The CHUQ has 12 pediatric oncology beds and provides tertiary care to a population of approximately 35 to 45 new cases of cancer in children per year. Furthermore, active pediatric oncology treatment can stretch over several months (over more than two years for leukemia), so the cohort

of children being treated simultaneously represents a much higher volume than the population numbers listed above.

To participate in the study, children had to have received a cancer diagnosis and be over two years of age. The parents of the children had to be able to speak, read and write French and give their written consent. To participate in the study, nurses had to be caring for a child benefiting from animal therapy and also had to give their written consent. Exclusion criteria were a positive skin test to dog allergens, severe neutropenia (less than 500 neutrophils/ $\mu$ L of blood), recent surgery or sterile-technique patient, and the display of an aggressive behaviour, an acute developmental disorder or cognitive deficiency preventing the child from having a normal interaction with an animal. A total of 16 parents and 12 nurses participated in the implementation study and constituted the sample.



**Table One: Summary of client outcomes: Percentages of agree and undecided among parents and nurses**

Client outcomes	Parents		Nurses	
	% agree		% disagree	
<b>Child</b>				
<i>By being responsible for a dog, my child was able to:</i>				
Develop a sense of "being essential to someone"	100	100	0	0
Express a sense of pride, accomplishment	96	100	4	0
Better accept hospitalization	92	100	4	0
Be more receptive to and compliant with treatments	88	100	8	0
Relieve or reduce anxiety	79	100	17	0
<i>In the presence of the dog, I was under the impression that my child:</i>				
Had developed a bond of friendship with the animal	96	100	4	0
Seemed happier (smiled and laughed more)	92	100	4	0
Had more self-confidence	78	100	18	0
Felt more "normal" or "less ill"	74	95	22	5
Was more motivated to continue with the hospitalization	74	100	22	0
Was more independent in meeting his/her needs	50	95	32	5
<i>The simple fact of being with the dog encouraged my child to:</i>				
Leave his/her room more often (interactions)	74	35	22	59
Participate in recreational activities (games, drawing)	70	57	25	20
Socialize and share with other children or adults	65	58	25	37
Get some rest	63	67	23	29
Overcome some difficulties	60	96	40	4
Get closer to others	55	75	36	20
Better nourish him/herself	48	67	29	24
Do physical exercise	40	66	35	24
Verbalize his/her fears and concerns	40	48	50	52

## Conduct of the study

The idea for the project was initiated in June 1998 followed by the official start in the fall of 1999 of a pilot project for a 12-month period (for more information on the pilot project, see Bouchard, Landry, Belles-Isles, & Gagnon, 2004). During the summer of 1999, a private room entirely dedicated to the animal therapy program was organized in the Pediatric Oncohematology Unit at the CHUQ and October 1999 saw the very first child benefit from the animal therapy service. The study on the implementation of the animal therapy program was completed during the first six months of the pilot project, from October 1999 to March 2000. Out of the 53 such services recorded, a total of 39 were evaluated. Some were not evaluated as a certain adaptation time was required before a proper assessment could be launched.

During an animal therapy session, the child spends the whole day, from eight to 16 hours, in the company of a dog. Beforehand, the participating dog must complete rigorous health and behaviour tests. The sessions take place in the room specially organized for this purpose. The child receives his nursing and medical care there while being able to interact and play with the dog. One of the parents, or else a person responsible for the child, must be in attendance throughout the day. This individual encourages interactions between the child and the animal.

During the study, confidentiality was ensured through the use of nondisclosure agreements. No personal data appeared in the data collection tools. Moreover, the individuals responsible for the study agreed not to use any information that would help recognize a particular subject whether it be in the written data report or in oral presentations. These individuals also undertook to observe the ethical rules in place at their health care institution. It was agreed that nurses would identify the parents and contact them to check on their interest in participating in the study. Once they had given their consent, they would receive their questionnaire through the nurse in charge of their child's care who had agreed to her own participation in the study and to complete the questionnaire intended for the nursing staff.

## Data collection and instruments

Data were collected with the help of three self-administered evaluation questionnaires (two questionnaires for parents and one questionnaire for nurses). The questionnaires were developed from the literature (Cole & Gawlinski, 1995; Fick, 1992; Hawley, 1998;

Jorgenson, 1997; Martin, 1993; Perelle & Granville, 1998; Ruckert, 1994; Saylor, 1998). Contents were validated by a panel of experts comprising three nurses with an expertise in pediatric oncology and practical knowledge of animal-assisted therapy, and a Laval University professor of measurement and evaluation. A pre-test was also completed with three mothers whose children had benefited from the animal therapy program. As we were studying an implementation process, the procedures surrounding the dogs' visits evolved according to certain corrective actions based on evaluations and feedback from both parents and staff. Therefore, the questionnaires went through frequent but minor transformations throughout the program implementation assessment.

The literature indicates that perceptions regarding the quality of care and services tend to be different based on the selected approach (patients/families perspective or health care professionals perspective) (Brunelle, 1993; Haddad et al., 1997; Ludwig-Beymer et al., 1993; Meisenheimer, 1991; St-Hilaire & Erickson, 1999). Thus, in an evaluation of the quality of a new approach such as animal-assisted therapy, it was important to take into account both the opinions of patients/families and those of the caregivers. This is why the questionnaires focused jointly on the perceptions of parents and of nurses regarding the quality of the animal therapy program.

A first questionnaire was administered to all parents whose children had benefited from the animal therapy program and to all nurses who provided care to these children between October 1999 and March 2000. Then, still for that same period, a second questionnaire was administered to the parents whose children had taken advantage of the animal therapy program more than three times and even more than five times in the course of their many hospitalizations. Some socio-demographic and medical data were also collated to describe the characteristics of children and parents. Descriptive analyses (both quantitative and qualitative) were performed on all the collected data.

The first questionnaire was intended for parents and is composed of three parts. The first part includes 20 statements grouped into three sub-scales (see Table One). These statements were measured on a five-point Likert scale, going from 0, "completely disagree" to four, "completely agree." The second part deals with parents' satisfaction as measured on a scale going from 0, "not at all satisfied" to four, "very satisfied". Finally, the last part of the first questionnaire comprises three open questions that were subjected to qualitative content analyses. The second questionnaire intended for parents includes two parts that are very similar to the first two parts in the first questionnaire. Only its measurement scale is different with a variation from 0, "no difference" to four, "a crucial difference."

The questionnaire intended for the nursing staff is comprised of four parts. The first two parts are exactly like those of the first questionnaire for parents. The third part is composed of 12 statements dealing with work organization as it relates to animal therapy. Finally, the last part contains two open questions that were, here again, subjected to qualitative content analyses.

## Results

The analysis of the results from the three project implementation evaluation questionnaires helped us reach our main objective, that is to say complete a descriptive evaluation of some of the effects of animal-assisted therapy from the answers by parents and caregivers.

### Profile of respondents

The analysis of the socio-demographic and medical data showed that of the 16 children who benefited from animal therapy, 89% were between three and 13 years of age and that 54% were taking advantage of the program for the very first time. Forty-six per cent of the children were male and 54%

**Table Two: Client outcomes summary: Satisfaction percentages for parents and nurses**

Client outcomes	Parents	Nurses
	% agree	
Very satisfied with the program	96	91
satisfied with the program	4	9
Very important for the sick child	65	90
Important for the sick child	35	10
Expectations exceeded	32	
Expectations fully met	52	
Expectations partially met	17	
Would recommend to others	100	
Would influence the choice of hospital or unit	92	
	% agree	
Well structured program	94	
Proper adjustments on each visit	94	
Positive impact on work	95	
	% disagree	
Gives extra work	100	
Detrimental to work in the unit	100	
Takes up too much room in the unit	100	

female. The child’s cancer had been diagnosed less than a year before in 77% of the children of whom 29% had leukemia. The 12 nurses had between two and 20 years of experience each, and most worked days on a full-time basis in the pediatric oncology unit.

**Elements of quality care (parents’ and nurses’ perspectives)**

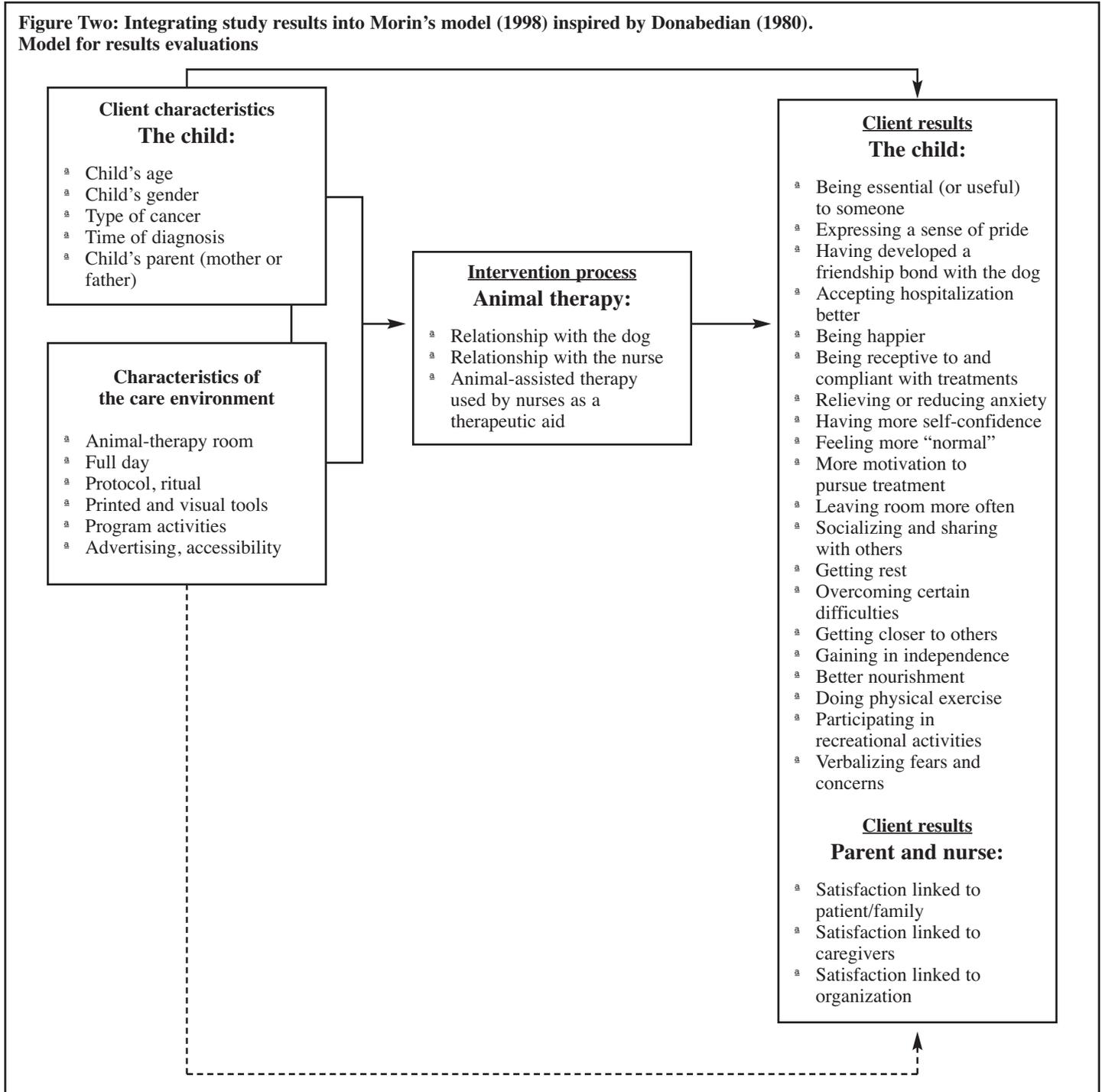
The main results have been grouped according to the four elements in Morin’s model, as illustrated in Figure One, i.e.: 1) characteristics of the populations, 2) structural characteristics of the care environment, 3) intervention process, and 4) client outcomes. Table One presents the agreement and undecided percentages among parents and nurses relative to various anticipated results with a pediatric population and found in the literature. It is easy to notice the differences that emerge between the opinions of parents and those of

nurses. Generally speaking, nurses are more often in agreement with the statements than the parents. In fact, nurses declared a lesser degree of agreement than the parents regarding only three of the 20 statements: *The simple fact of being in the company of a dog encouraged the child* 1) to leave his or her room more often, 2) to participate in recreational activities, and 3) to socialize and share with others.

Table Two presents a few satisfaction percentages for parents and nurses regarding the level of global satisfaction, the importance and structure of such a program, parents’ expectations, and work organization.

Other elements of satisfaction were collated during the open questions content analysis. These elements address organizational structure that is defined as comfortable, quiet, relaxing, peaceful, soft

**Figure Two: Integrating study results into Morin’s model (1998) inspired by Donabedian (1980). Model for results evaluations**



and warm. A few other elements related to the intervention process apply to the dogs themselves. Terms such as fascinating, warm, good and free are used. Lastly, some elements refer more specifically to client outcomes: 1) the child with cancer: is more independent, eats more, tells of loving the hospital; 2) the parents, who state that hospitalization is a happier event, that it is a day of happiness and that it helps with morale; and 3) nurses, who see themselves as more cheerful and joyful, more motivated, more positive and that the program facilitates their work and raises their spirits.

A second questionnaire was also administered to seven parents whose children had taken advantage of the animal therapy program more than three times and even more than five times in the course of their numerous hospitalizations. Since the beginning of the animal therapy sessions, half the parents stated having noticed a major difference in their child regarding: a) an improvement in the child's general well-being, b) the development of a friendship bond with the animal, and c) the child's participation in recreational activities. More than half the parents declare having also noticed a moderate improvement in their children regarding compliance with treatments and motivation to continue with their hospitalization as well as a major difference with regards to distractions in the hospital. Lastly, half the parents stated having noticed a major difference during the day of the program with regards to the fear, pain and discomfort felt by their children related to the treatments and procedures.

#### **Integrating the main results into the evaluation model**

Figure Two shows the integration into Morin's evaluation model (1998) of the main results from the implementation study.

We can notice from this figure that the quality assessment of the animal therapy program includes concerns related to 1) the program users' profile: age, gender, type of cancer, and time of diagnosis, 2) the animal therapy intervention process: relationship with the dog and its use by the nurses as a therapeutic aid, 3) the organizational structure: room, full day, rigorous protocol, various printed and audiovisual tools, related activities and program accessibility, and 4) the client outcomes: children, parents and nurses.

## **Discussion**

This study's main objective was to complete a descriptive evaluation of the animal therapy program implementation using Donabedian's framework (1980) and, more specifically, Morin's model (1998). More precisely, this study was aimed at documenting the observed link between participation in the program, quality of care and satisfaction of both parents and participating nurses. Given the descriptive design used, it is possible that the results could be attributed to the overall animal therapy process (room and atmosphere, dog's presence, difference in contacts with the nurse, and related activities) rather than to the sole presence of the dog.

#### **Animal therapy's beneficial role**

This study highlighted some dimensions for which an improvement was observed. Thus the results underline the potentially beneficial role of animal therapy on the physical dimensions (rest, nourishment, exercise), social (socialization, being closer to others, leaving the room more frequently, participating in recreational activities), emotional (decrease in anxiety, appearing happier, verbalizing fears and concerns), and coping (better acceptance of hospitalization, overcoming some problems, being more accepting of treatment, more independent, more motivated to continue with hospitalization), and self-esteem (sense of pride, accomplishment, sense of being more "normal", to be essential to someone, more confident in self). These results and the degree of satisfaction derived by the various stakeholders mesh closely with those mentioned in the literature (Barba, 1995; Bardill & Hutchinson, 1997; Brodie & Biley, 1999; Jonas & Feline, 1981; Kogan et al., 1999; Mallon, 1994b;

Poleshuck, 1997; Struck & Brady, 1998; Teeter, 1997). Furthermore, these preliminary data supported the development of the second research phase on the program effectiveness, which started in January 2003.

## **Study limitations**

The study has limitations inherent to a descriptive study on the implementation evaluation of a pilot project. These are, among others, the small size and non-representativity of the sample and the lack of psychometric qualities for the questionnaires (validity and reliability), which limit data validity. Moreover, the nature of the statements in the questionnaires may have had a suggestive effect on expected results and have influenced the parents' and nursing staff's responses. It is also important to note the percentage of undecided as presented in Table One speaks volumes, at times reaching up to 52%. This finding may be due to the therapy's novelty or to the difficulty the participants felt in making up their minds. However, the identification of a great number of potential benefits and the description of a unique and innovative animal therapy program can be seen as important strengths for this study, which is meant as a first step in the evaluation.

## **Implications for practice and research**

Nurses occupy a privileged position to ensure the well-being of children hospitalized for their cancer and their families. It would appear that dog-assisted therapy can contribute to alleviate psychological distress in children and parents alike, facilitate their coping with the therapeutic process, and promote their well-being throughout hospitalization. However, further studies are needed to better understand this new therapy's action process and to empirically support its use. These are the reasons why a second evaluation phase into the effectiveness of the animal therapy program was developed.

Upon completion of the pilot project, the program was officially recognized by CHUQ's board of directors in the fall of 2000 and its continuation has been formally supported by an operating budget. The development and implementation of the animal therapy program constituted the first phase of the project. Several positive effects were observed during the study on its implementation. However, the effectiveness of the program remains to be documented. The second phase of the project is already underway and aims at verifying the effectiveness of the animal therapy intervention by focusing more specifically on children treated in a hospital setting for solid tumours. This population was selected because it generally receives chemotherapy over long periods of time, a situation likely to be associated with pronounced psychological distress. More specifically, the research objectives are to verify whether or not animal therapy is associated with a) a significant mood improvement (e.g., anxiety, depression) and other functioning indicators (e.g., social interactions, activity level), b) a decrease in physiological stress indicators (e.g., cortisol, blood pressure) and a decrease in side effects related to chemotherapy (e.g., nausea, pain, loss of appetite, sleep disorders) as assessed by parents and the children themselves, and c) better coping on the parents' part regarding their child's disease.

The research design used in the second phase is a single-case experimental protocol where the subject is making comparisons with himself or herself. This research protocol was developed collaboratively with Laval University's Faculty of Nursing and School of Psychology. The investigation was started in January 2003 and it includes various measurement activities with the children, their parent(s) and nurses. The researchers expect to find a significant improvement in some of the children's symptoms and better coping among the parents. The results of the study will be used as additional preliminary data for the third phase of the project, which could involve at least two settings specializing in pediatric oncology when it takes place.

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