

## Multiple case study applied in nursing research: a case report

*Estudo de casos múltiplos aplicado na pesquisa de enfermagem: relato de experiência*  
*Estudio de casos múltiples aplicado en la investigación de enfermería: relato de experiencia*

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### ABSTRACT

**Objective:** To report the experience of using the method of multiple case study. **Method:** We used the method of multiple case study, conducted with children and adolescents assisted in the pediatric oncology inpatient unit. **Results:** The steps used for the development of a multiple case study were: Step 1 - Define and design; Step 2 - Prepare, collect and analyze; Step 3 - Analyze and complete. The steps included the development of a research project with the definition of its components, preparation of protocol for the case study, data collection, individual report of cases, data analysis and final report with data cross-referencing. **Conclusion:** The case study method can be used by nurses and contribute to the advancement in knowledge of nursing as a science and therefore contribute to a full care practice in the context in which the phenomenon happens.

**Descriptors:** Nursing; Case Studies; Methodology; Nursing Research; Methods.

### RESUMO

**Objetivo:** Relatar a experiência sobre a utilização do método de estudo de casos múltiplos. **Método:** Utilizou-se do método de estudo de casos múltiplos, realizado junto a crianças e adolescentes assistidos na unidade de internação da oncopediatria. **Resultados:** As etapas utilizadas para o desenvolvimento de um estudo de casos múltiplos foram: Etapa 1 – Definir e projetar; Etapa 2 – Preparar, coletar e analisar; Etapa 3 – Analisar e concluir. As etapas contemplaram a elaboração do projeto de pesquisa com a definição dos seus componentes, elaboração do protocolo para o estudo de caso, coleta de dados, relatório individual dos casos, análise dos dados e relatório final com cruzamento dos dados. **Conclusão:** O método de estudo de caso pode ser utilizado por enfermeiros e contribuir para o avanço no conhecimento da enfermagem como ciência e consequentemente contribuir para uma prática de cuidado integral no contexto em que o fenômeno acontece.

**Descritores:** Enfermagem; Estudos de Caso; Metodologia; Pesquisa em Enfermagem; Métodos.

### RESUMEN

**Objetivo:** Relatar la experiencia sobre la utilización del método de estudio de casos múltiples. **Método:** Se utilizó del método de estudio de casos múltiples, realizado junto a niños y adolescentes asistidos en la unidad de internación de la oncopediatria. **Resultados:** Las etapas utilizadas para el desarrollo de un estudio de casos múltiples fueron: Etapa 1 – Definir y proyectar; Etapa 2 – Preparar, recoger y analizar; Etapa 3 – Analizar y concluir. Las etapas contemplaron la elaboración del proyecto de investigación con la definición de sus componentes, la elaboración del protocolo para el estudio de caso, la recogida de datos, el informe individual de los casos, el análisis de los datos y el informe final con el cruce de los datos. **Conclusión:** El método de estudio de caso puede ser utilizado por los enfermeros y aportar para el avance en el conocimiento de la enfermería como ciencia y consequentemente aportar para una práctica de cuidado integral en el contexto en que el fenómeno ocurre.

**Descriptores:** Enfermería; Estudios de Caso; Metodología; Investigación en Enfermería; Métodos.

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## INTRODUCTION

In the last decade, nursing research has been developing with new challenges, and researchers are building, expanding and introducing new methodologies in their researches. The search is not just for methodological rigour, but also for the production of relevant studies that allow the application of knowledge in nursing practice<sup>(1)</sup>.

One of the methods that have been applied in scientific research in nursing and in areas such as psychology, sociology, anthropology, social work, administration, education and political science is the case study<sup>(2)</sup>.

The case study is defined as an empirical research that seeks deep a contemporary phenomenon, that is, the case in its real-world context; it is characterized by being a comprehensive method that includes from planning of the research project, with the definition of its components, to the data collection techniques and specific approaches for data analysis<sup>(2)</sup>.

Case studies can be presented with combinations of qualitative and quantitative methods, applied in various situations in the investigation of individual, group, organizational, social and political phenomena, which allow researchers to focus on a case under a holistic perspective and in a real context. They are classified as single case study or multiple case study; this second type involves more than a single case and has the advantage of providing, through the evidence of the cases, a more robust study<sup>(2-3)</sup>.

As well as various methods, case studies have advantages and disadvantages. The main advantages are the applicability in different epistemological orientations and the possibility to use multiple sources of evidence. It benefits from the prior development of theoretical propositions that guide data collection and analysis, formulation of hypotheses and the possibility of development of theories<sup>(2,4)</sup>.

As a disadvantage, the case study method presents limitations such as the inability to generalize the results obtained from conclusions specific to the cases studied, not allowing generic conclusions. It requires a more refined methodology and more time for collection and data analysis<sup>(2,4)</sup>.

The planning and execution of the study requires accuracy. One concern of the researchers is the negligence caused by the non-systematic development of the method, in addition to sometimes being confused with teaching cases, in which the materials that constitute the study can be changed to demonstrate a particular point or a more effective result<sup>(2)</sup>.

Thus, the use of this method is a strategy of scientific research, since it enables the investigation of phenomena in the real context of nursing, with various sources of evidence that allow the reflection and the search of alternatives to solve problems and, consequently, contributes to the advancement of knowledge<sup>(5)</sup>.

## OBJECTIVE

Collaborate for the dissemination of the research method Multiple Case Study, proposed by Robert K. Yin, in the construction of a research on the use of music in care for children and adolescents with cancer.

## METHOD

This is a case report about the use of the multiple case study in a master's thesis, therefore, the results are not presented, but how the method was used.

The study was conducted in a hospital specialized in the attendance of people with cancer in the state of Paraná, with five children and three adolescents in pain, assisted in the pediatric oncology unit.

The research project was submitted to the Research Ethics Committee (REC) of the Health Area of the Federal University of Paraná, according to the Resolution 466/2012 of the National Health Council<sup>(6)</sup>.

## RESULTS

### Description of the steps of the multiple case study

The steps of the case study are: preparation of the research project with the definition of its components (research question, theoretical propositions, unit of analysis, data linkage to the propositions, criteria for interpreting the findings); development of the protocol for the case study; data collection; individual report of cases, data analysis and final report with data cross-referencing.

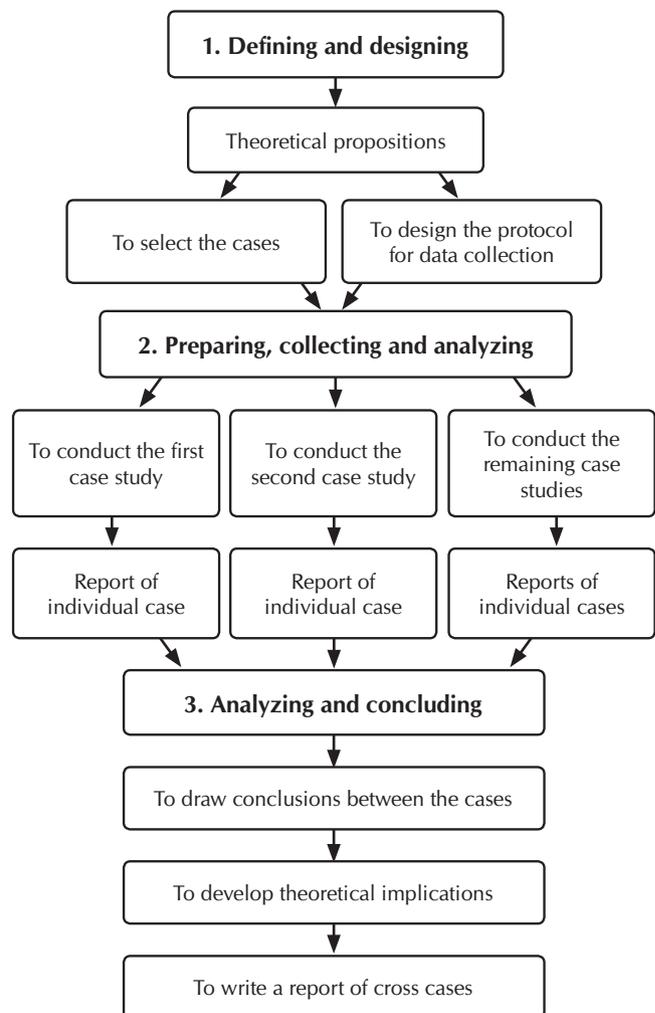


Figure 1 – Steps of the multiple case study, adapted from Yin, 2015

Thus, for the construction of the multiple case study, were performed the following steps<sup>(2)</sup> listed below and shown in Figure 1.

**Step 1 – Defining and designing**

In the first stage, the proposition of the study and the procedures for data collection were defined from the research question, which aimed to assess the influence of music on pain in children and adolescents with cancer.

In the case studies, the most used questions are “how” and “why” a phenomenon happens; however, in this study, and considering the objective intended, the researchers presented as guiding question: What is the influence of music on pain of children and adolescents with cancer in a pediatric oncology unit?

After defining the research question, we sought to define the proposition of the study, which directs attention to the focus of what is to be investigated; and the definition of the third component of the case studies, the analysis units, that is, the participants of the survey, which can be either a single person or a group of people, some event or entity, programs or organizations<sup>(2)</sup> (Chart 1).

**Chart 1 –** Components of the Stage 1, Define and design, in multiple case study

<b>Components of the first step in the study “Use of music in care for children and adolescents with cancer: multiple case study”</b>	
Research question	What is the influence of music on pain of children and adolescents with cancer in a pediatric oncology unit?
Theoretical proposition	Music reduces pain in children and adolescents with cancer.
Analysis unit	Children and adolescents with cancer in pain admitted to a pediatric oncology unit.
Data linkage to the propositions	Analytical technique: cross-synthesis of data
Criteria for interpreting the findings	Use of statistical analysis

The components – data linkage to the propositions and criteria for interpreting the findings – are elements that can anticipate the steps of data analysis and indicate techniques for analysis and interpretation of the findings<sup>(2)</sup>.

With the definition of the components of the study, the protocol for data collection was elaborated, which is a structured instrument for collecting information, in addition to holding the set of procedures and general rules that will conduct this step of the research<sup>(2)</sup>.

The protocol must contain: overview of the case study, contemplating the objectives, hypothesis, propositions and readings on the topic to be investigated; data collection procedures; specific questions intended to be investigated and possible sources of evidence; and script for the case reports<sup>(2)</sup>.

In this way, we performed literature reviews and search of relevant studies about the use of music as a therapeutic resource in the care of children and adolescents with cancer, which served as scientific-theoretical basis to the formulation of the theoretical proposition of the study and that contributed to data analysis.

Regarding the procedures for data collection, the approach of the researcher with the research field was held, and scripts were elaborated to gather information relating to the participants and the description of the proposed care intervention, considering the specific questions and sources of evidence for further preparation of the report.

**Step 2 – Preparing, collecting and analyzing**

In the second step, data were collected by the intervention proposed and the individual report for each case was written. Data were collected from February to August 2016, upon the approval of the study by REC.

One of the principles relevant to the collection of data on case studies is the use of multiple sources of evidence, which allows the researcher to develop converging lines of research and the triangulation of data during analysis.<sup>(2)</sup> Thus, the data sources used in this research were: the participant’s physical and electronic medical record; questionnaire applied by the researcher to identify musical preference; and direct observation with rating of dependent variables and application of the intervention proposed (independent variable).

Data from medical records are the documental source, containing information relevant to contextualize the analysis unit, since they support and increase evidence from other sources<sup>(2)</sup>.

As for the questionnaire, there is the advantage of saving time, with fast and accurate answers from the participants and greater freedom in the responses<sup>(7)</sup>. The questionnaire can be applied by the researcher, as occurred in this study, in which the instrument contemplated the information necessary for the identification of musical preference.

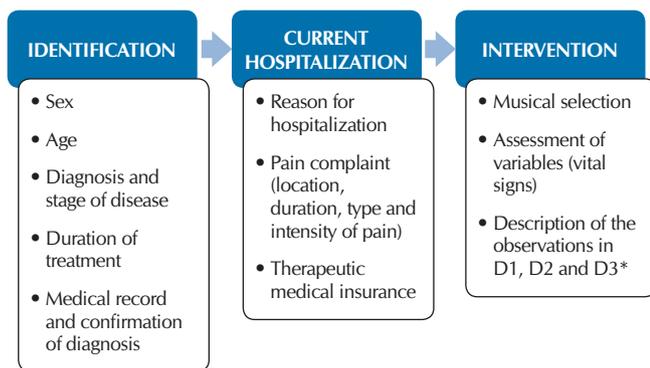
For assessment of the dependent variables and application of the proposed intervention (independent variable), direct/non-participant observation was used, providing the close and personal contact of the researcher with the reality and the phenomenon researched, which allowed to identify attitudes and behaviors, to obtain evidence and records and to accumulate information. It can be classified as systematic or structured observation, when using instruments for data collection to find answers for pre-set objectives, as proposed in this study<sup>(7)</sup>.

After approach to invite and introduce the research to the family and the participant, considering ethical aspects, data collection began and the following steps were performed: 1<sup>st</sup> – Identifying the music preference of the participants; 2<sup>nd</sup> – Gathering information of the medical records; 3<sup>rd</sup> – Playlist made on a media player device with the musical selection chosen by the participant; 4<sup>th</sup> – Assessment of the dependent variables (heart rate, respiratory rate, blood pressure, body temperature and pain) before the musical intervention; 5<sup>th</sup> – Musical intervention (independent variable); 6<sup>th</sup> – Assessment of the dependent variables in two moments after the musical intervention.

The independent variable was the nursing intervention “to perform music hearing”, which consisted in the installation of disposable headphones for hearing songs pre-selected by the participants. The songs stored on portable media player device were programmed for a period of audition up to 15 minutes in individual sessions. Three sessions were held with each participant in dates and times pre-booked.

For the application of musical intervention, the guidelines for reports of musical interventions were followed. These guidelines recommend that researchers include in their studies: the theory of intervention or theoretical reference; the content of the intervention (details that compose the intervention: the selected song, the person who selected the song, method, strategies and materials used for intervention); the programming of intervention (number of sessions, duration and frequency); the person who performed the intervention and her/his qualifications; the strategies used to ensure the fidelity of the treatment (protocols, monitoring, training); the scenario where intervention was performed; and the target audience, participants with individual or group interventions<sup>(6)</sup>.

Eight units were selected for analysis and, after data collection procedures, the individual reports of each case were written, following the structure presented in Figure 2.



*Observation: Three sessions were held with each case in three consecutive days – Day 1 (D1), Day 2 (D2) and Day 3 (D3) – and all of them occurred in the afternoon.*

**Figure 2** – Structure for presentation of cases

### Step 3 – Analyzing and concluding

In case studies, data analysis is performed through some strategies, and the researchers can use several techniques and tools, such as the use of computer programs, tables, categorization, tests and combination of evidence<sup>(2)</sup>.

In this research, the strategy used for data analysis was based on theoretical propositions, rescuing the original objectives, literature review, propositions or hypotheses of the research project and statistical calculations for quantitative data.

The analysis technique applied was cross-synthesis of data, because it had more than one data source and individual cases. This technique is applied only to analyses of multiple case studies, allowing more robust findings than the single case<sup>(2)</sup>.

Thus, in a first moment, the cases were individually analyzed; then, with cross-referencing of data, they were analyzed in their entirety.

### CONCLUSION

The aim of this study was achieved through presentation of the multiple case study method used in a master's thesis. One of the possibilities of application of this method of scientific research was presented.

The method is applied in studies in both qualitative and quantitative approach, of exploratory or descriptive types, allowing the triangulation between methods, keeping the conceptual reference and the initial proposals of the study as a reference. It also allows the use of various techniques for data collection, in investigations of single or multiple cases, to investigate specific phenomena of an individual or of a particular population, with results that allow comparisons, reflections and discussions on the topics and problems encountered and experienced in the daily lives of researchers and professionals working in the area of health and nursing.

Although the case study method presents limitations, such as the impossibility of generalizing the results obtained – with conclusions specific to the cases studied, not allowing generic conclusions –, in nursing, it permits to know in depth aspects of a determined phenomenon. However, in this perspective, it is possible to make some generalizations when the context involves longitudinal, typical and rare cases. It can be used by research nurses and contribute to the development in the knowledge of nursing as a science and therefore to an comprehensive care practice in the context in which the phenomenon happens.

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