

# **Research approaches and statistical analyses used by dentistry students at the University of Los Andes, Venezuela.**

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## **Abstract**

As part of their career, since the last years, dentistry students at the University of Los Andes do research from the first year in which they start with a documental review. Then, in the second they work with descriptive studies, and in the third they can do experimental research. Finally, in their fourth year, they start planning their final research as a requirement to get their degrees and it is up to them to select the approach and type of research they want to conduct. This study arose with the objective of describing the research methods, designs and statistical analyses students select for their final papers. In this sense, a corpus of research papers developed by dentistry students as a requirement to get their degree was examined and classified. Results show that quantitative approaches are the most popular. However, a slight trend to incorporate qualitative methodologies was observed in the most recent papers. It was also observed the high amount of descriptive studies which happen to be most popular among the quantitative studies. Statistical analyses used are mainly descriptive. Results show the importance to encourage students to do research under different research approaches that let them to research problems from different perspectives.

### **Key words:**

Research, approaches, statistical analyses, dentistry students.

## 1. INTRODUCTION

Research is a crucial element for science as it is a source for new knowledge. In dentistry, as in any other medical science, research has placed an important role since the last decades, especially with the AUGM of Evidence Based Dentistry (EBD). EBD demands from current professionals basic abilities for conducting sound, methodologically rigorous studies that can help dentists to take appropriate decisions in their practice [1]. In this sense, the Faculty of Dentistry of the University of Los Andes (FOULA for its name in Spanish) has included research in the curriculum as part of an updated integral formation of dentists and more emphasis has been devoted to writing scientific texts and reading comprehension and writing have been emphasized as a recursive process instead of as a product [2].

This approach takes the FOULA in an advantaged place because as some authors affirm, there is a close relationship between science and development and that relationship is determined by the interaction between education and research [3]. In fact, as a consequence of the promotion of research, the FOULA has raised its ranking as knowledge producer, determined by the amount of faculty's publications and granted research projects, among other.

It has been few years since the systematical study of research methodology was included in the study plan of the FOULA. During those years, students have conducted different research projects some of which have even been granted by the university. In some cases, papers resulting from different subjects from first to third year in the curricular line of Research have been presented later as poster or lectures in different national and international scientific events. Even more, some of them have won prizes as best posters while other have been published in journals. This outcomes help to create a criterion about the quality of the research produced by students in the FOULA.

When students start their fourth year, they present (as the final grade of the subject of methodology) a research project that will become their final paper (e.i., a special research paper to get their degree). However, no study has been designed to evaluate either the quality of final papers or research trends and methodologies. In this sense, as the beginning of a broader research project intending to evaluate research production at the FOULA, the present study aimed to describe the research methods, designs and statistical analyses students select for their final papers. The results of this research can give an idea about students preferences in terms of methodology, and hence to be able to reinforce the use of some methodologies and to suggest the inclusion of different ones aiming to produce high quality papers useful for EBD in the country and abroad.

## 2. MATERIALS AND METHODS

The sample was constituted by all final papers from January to September 2008 (January-September). This year was selected by simple hazard following Arias' [4] criteria for determining samples. A total of 40 final papers were registered in the period January-September constituted the study sample.

For this descriptive exploratory research data were recorded on an observation instrument developed by the authors according to Hernández, Fernández and Baptista's classification of research approaches, designs and types [5]. The instrument was previously validated through the experts' judgment technique. Therefore, final papers were reviewed in terms of approach (qualitative, quantitative, holistic), type (descriptive, correlational, exploratory and explicative), design (observational, experimental, transversal, longitudinal) and statistical analyses (descriptive, inferential, qualitative).

## 3. RESULTS

Data were processed by using SPSS 13.0 to get frequency tables for each variable. When building the data base it was possible to observe that one paper was a documental review and other was an executable project (term used for projects aiming production of materials to solve a practical

problem) which is not considered a type of research itself [6]. Therefore, 38 papers were deeply reviewed in terms of design, type and statistical analyses.

Data showed that the research approach preferred by students is the quantitative one. Distribution of papers according to approach is shown in Figure 1.

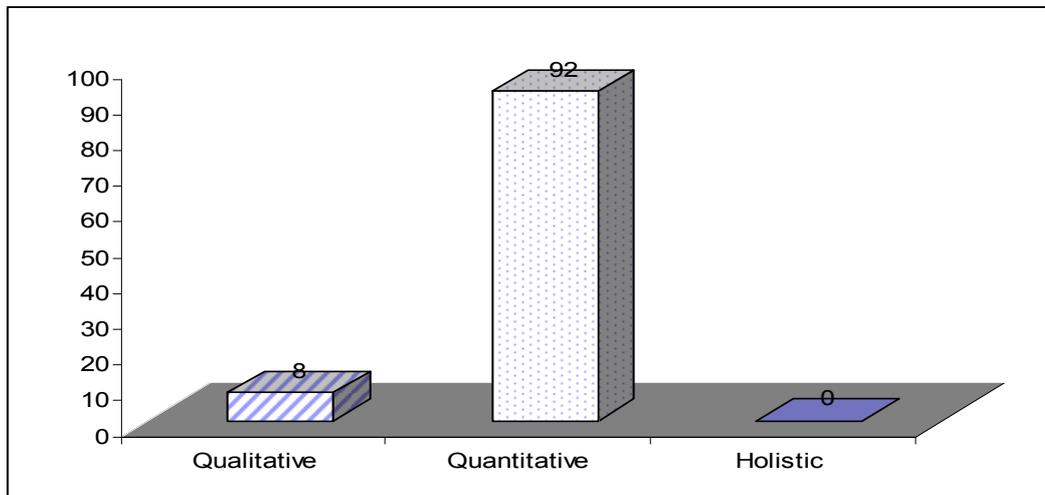


Figure 1. Percentage of final papers for each research approach.

In relation to research type, it was observed that descriptive research happens to be more popular among students (see Table 1).

Table 1. Distribution of papers by research type.

<i>Type</i>	<i>fi</i>	<i>%</i>
Descriptive	23	61
Correlational	8	21
Exploratory	2	5
Explicative	5	13
<b>Total</b>	<b>38</b>	<b>100</b>

Students prefer observational designs rather than experimental ones (see Table 2) and transversal designs rather than longitudinal ones

Table 2. Distribution of papers by designs.

<i>Design according to Variables manipulation</i>			<i>Design according to data gathering</i>		
	<i>fi</i>	<i>%</i>		<i>fi</i>	<i>%</i>
Observational	30	79	Transversal	32	84
Experimental	7	18	Longitudinal	5	13
Ethnographic	1	3	Retrospective	1	3
<b>Total</b>	<b>38</b>	<b>100</b>	<b>Total</b>	<b>38</b>	<b>100</b>

As it could be expected, in most of the papers statistical treatments for the data were descriptive (See table 3). Frequency tables were the most frequent analyses followed by descriptive statistics such as means and standard deviations. Most popular graphics were bars and sectors.

Table 3. Distribution of papers according to statistical analyses.

<b>Design</b>	<b>Fi</b>	<b>%</b>
Descriptive	22	58
Inferential	13	34
Qualitative	3	8
<b>Total</b>	<b>38</b>	<b>100</b>

The frequency of different inferential analyses was established. The most common statistical treatment was  $X^2$ , followed by *t test* and ANOVA (see Table 4). Just one paper included a different analysis.

Table 4. Different inferential analyses observed in the papers.

<b>Design</b>	<b>fi</b>	<b>%</b>
Chi squared	6	16
T test	3	8
Pearson coefficient	2	5
ANOVA	3	8
Kruskal Wallis test	1	3
<b>Total</b>	<b>15</b>	<b>100</b>

It was noticed that authors of two descriptive studies included inferential analyses to go beyond their objectives and present ancillary findings.

#### 4. DISCUSSION

Few studies similar to the present one have been found in the literature [7, 8]. In Venezuela there is not published study that can be used for comparison with the present research. This situation highlights the need for the promotion of research in Venezuelan universities and the need for more research in the field of teaching of methodology and research at the university levels, and especially in health sciences.

Results let us to agree with authors claiming that quality of research in dentistry needs to improve even more [9]. Even when the FOULA has advanced by inserting a research culture in the students, it is mandatory to redefine that culture helping students to realize the importance of such an activity as research.

Results in the present study state descriptive papers as the main choice when doing research at the FOULA. It is necessary to start conducting more experimental inquiry and clinical trials that help dentists to know etiologic factors of some diseases and pathologies as well as to take decisions related to the effectiveness of some treatments. Descriptive studies (which happened to be the most popular as final papers at the FOULA) are not useful for establishing etiological factors, giving prognosis and to determine the effectiveness of treatments, therefore, they are not very helpful when working with EBD [10]. In this sense, it is necessary to enhance students to take risks and bigger challenges by conducting more methodologically consistent experimental research in order to contribute to decision making in the practice, taking into account that the best evidence increases effectiveness in dental practice [1]. Besides, it would be very useful to research on students' attitude towards research as part of their careers and to analyze the reasons for their choices in terms of design and research type.

In relation to qualitative research, it is not quite popular among FOULA students even when qualitative research has gained popularity in medical sciences. Some researchers indicate that qualitative research has been increasingly recognized in recent years as having a distinctive and important contribution to make to health care inquiry [11]. However, there is still resistance for including it in systematical review for EBD. This might explained the little interest showed for this approach at the FOULA even when some authors [11, 12, 13] have devoted time and effort to prove the usefulness of well structured qualitative research for EBD.

As qualitative research in dentistry is still a new trend in Venezuela, more research about methodology teachers' knowledge and practice on this inquiry approach as well as the quality of the

papers produced under it in terms of objectives establishment, techniques and instruments for data gathering and analysis, among other is required.

In sum, more research is needed in the FOULA in order to evaluate quality of the papers and to particularly evaluate whether experimental research is being methodologically good enough according to the criteria for EBD. This evaluation will let the FOULA to improve constantly not just as an educational institution in general, but in the formation of up dated competent productive professionals ready to face the current requirements in the practice of dentistry and medical sciences in general.

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