Quality of the Academic Research of a Postgraduate Degree in Surgery from a Public University of Ecuador.

Jorge Antonio Delgado Pauta (✉ jorge.delgadop@ucuenca.edu.ec)
University of Cuenca

Franklin Mora Bravo
University of Cuenca

Research Article

Keywords: Educational research, research sections, research quality, master's thesis.

Posted Date: October 6th, 2021

DOI: https://doi.org/10.21203/rs.3.rs-944755/v1

License: ☕️ ☑️ This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License
Abstract

Introduction: the lack of solidity of educational research (ER) in a high percentage the loss of integrity in the methodology has been reported. The objective of the present study was to determine the quality of the ERs of the postgraduate surgery in a Public University of Ecuador. With the hypothesis that the acceptable theses are equal to 70%.

Methods: the present study reviewed the thesis of surgery at the University of Cuenca, from the period January-2010 to November-2019. The probabilistic sample selection was 48 cases. A 51-question EI quality test was used. The values of each variable were homologated as a percentage. A single sample T-test was performed, bivariate correlations using the Spearman coefficient. Significant values were R> 0.5 and P <0.01. The hypothesis test was performed with Chi square.

Results: of 48 randomized theses, the lowest average was in the “Hypothesis” sections (41.6% [35.3-47.8]) and the highest in the “Results” sections (93.5% [91.4-95.7]). The relevance was 97.9% (93.7-102.1). 35 theses (72.9%) were rated as "Acceptable". The Hypothesis and References sections were rated as "Not acceptable" in 70.8% and 79.2%. The "results" section obtained the rating of "Excellent" in 93.8%. The hypothesis was accepted, the group has an acceptable quality equal to 70% ", Chi$^2$ = 0.2208, P = 0.64.

Conclusion: the quality of educational research is equal to the 70% raised in the hypothesis, which highlights a minimum sufficiency rating for the educational research studied in this work.

Introduction

The lack of solidity of regular academic research or educational research (EI) is a relevant issue that has been studied in Latin America. In a report in Peru of 47 Master's theses in Public Health, and 172 undergraduate theses, 66% and 79.9% were unacceptable due to loss of integrity of their methodology [1, 2]; this problem is similar in the nursing area [3, 4]. There is always someone responsible for the quality of the EI, this person should have the ability to make an editorial cut even prior to the start of the research in the protocol conformation phase [5, 6]. With this methodology it would be possible to achieve acceptability and excellence results of up to 72.4% and 6.4% [7, 8].

Educational research constitutes a graduation requirement in postgraduate medicine and quality errors could be attributed to a low-quality methodological design, the lack of feasibility of the research, the low interest in the topic, the lack of relevance of the research idea and a possible ethical weakness of the study. The first factor is explained by the type of study used. Descriptive studies are easier to carry out than comparative studies, so the former are the most chosen. To mitigate this fact, the university regulations of some committees have suggested that comparative groups be preferred for the presentation of protocols and that they have the approval of a specialist research advisor. Another important point is the type of variable studied, since some produce “hard data” that include specific
measurements such as serum protein levels, gene expressions, etc., while “soft data” measurements report subjective questionnaires such as quality of life or health test, etc.

The feasibility of a study should consider whether there will be a sufficient number of cases to saturate the sample calculation, whether there are financial and human resources for the research and whether it is feasible to carry out special tests (genomic, chemical) that comply with the main purpose of an investigation, which is the generation of knowledge. If it is stated that a study has a weakness due to the loss of its feasibility, it is generally not approved by a committee, however, when doing so, the studies generally do not culminate and constitute a group of truncated investigations that abound at the university level.

The confusion between uncertainty and research can mean that a research idea is not clear enough. Researchers are generally postgraduate and every time they treat a patient, even with a known therapy, an element of uncertainty arises. For this reason, doctors sometimes point out that all treatment amounts to an experiment and that the element of experimentation becomes even more pronounced when, as is often the case, routine regimens vary slightly, trying to achieve better results than those produced with a standard approach. Describing such therapeutic interventions - whether it is a slight deviation from a standard treatment, or a major innovation - does not violate common usage, although, for various reasons, these interventions should not be confused with what is research.

Knowledge is new when it generates a concept that the scientific community recognizes as such, although research can brilliantly provide semi-new knowledge with a concept from another area applied to medicine, redundant studies abound in medicine with the criterion that these epidemiological data do not exist in our area, this is what determines the lack of relevance of a study and the subsequent deterioration of the results of a "local" study with a non-significant number of patients.

A poorly designed study is not robust. One of the most controversial aspects refers to the fact whether the research ethics committees (IEC) should evaluate the scientific suitability of the protocols they review. RECs usually have this responsibility, but their way of carrying out this task is often the subject of harsh criticism. Exposing study participants to physical or social harm, discomfort, or even inconvenience, can only be justified when there is good reason to anticipate some compensatory benefit to society - that is, to the body of scientific knowledge or the well-being of future patients or of society in general - and perhaps also for the participants. Therefore, a study should never be undertaken whose design presents such a number of problems that it will hardly leave any teaching [9]. (Figure 1). An investigation without solidity can report paradoxical results, which will hardly be publishable. If it is known that the measurement of the research activity of a university center is given by the number of articles published in high impact journals, this will affect the postgraduate score, the institution and the administrative level in the allocation of funds for publication ( Figure 1).

The objective of the present study was to determine the quality of the regular educational investigations of the postgraduate surgery of a Public University of Ecuador, with the hypothesis that more than 70% of educational investigations have a good degree of acceptability.
Materials And Methods

For this study, a review of the theses published in the electronic repository of specialty theses of the Postgraduate in Surgery at the University of Cuenca was carried out, during the period from January 2010 to November 2019. The selection of the sample was probabilistic based on or reference to a universe of 60 published theses. The sample calculation corresponded to 48 cases which were randomized that fulfilled the complete data for the analysis, using the formula \( n = \frac{Z_{a/2}^2 p(1-p)}{d^2} \), heterogeneity 9%, margin of error 5%, 95% confidence level. A 51-question test was used to rate the quality of educational research, used in a previous study published by a collaborating group [10]. The variables were grouped into sections of the article giving a score of 8 for the title and abstract, 12 for the statement of the problem, 10 for the theoretical framework, 18 points for the hypothesis and definition of variables, 30 points for the study methodology, 18 points for results, discussion, conclusions and recommendations, 4 points for bibliographic references, 20 points for relevance of the study. The author was the reader of the theses, full access to each study was obtained. We proceeded to fill in the data of each investigation in an electronic sheet. The statistical analysis software was SPSS 21.0. The variables are reported as frequencies and percentages. The values of each variable were homologated with their unique maximum value to obtain the percentage value. A single sample T test was performed between the averages of the homologated variables. As a secondary analysis, the correlation between the variables was proposed using the Spearman coefficient, significant values are reported with R> 0.5 and \( P <0.01 \). The hypothesis test was performed with Chi square.

Results

48 research projects were analyzed with their final report published in the institutional repository of the University of Cuenca, which corresponded to theses of postgraduate students prior to obtaining the title of Specialist in Surgery. Most of the topics covered are general surgery topics: bile duct, digestive, surgical management of hernias. The quality scores in each variable are described in Table 1.
Table 1
Description of the quality of the academic research sections.

|              | T&AR  (8 p) | RP  (12 p) | TF  (10 p) | H&V  (18 p) | MET  (30 p) | RDC  (18 p) | REF  (4 p) | REL  (20 p) | QOM |
|--------------|-------------|------------|------------|-------------|-------------|-------------|------------|-------------|-----|
| Casos Válidos | 48          | 48         | 48         | 48          | 48          | 48          | 48         | 48          | 48  |
| Average      | 5,5         | 9,5        | 7,3        | 7,5         | 22,3        | 16,8        | 2,1        | 19,6        | 71,1|
| Std.Error (mean) | 0,2      | 0,3        | 0,3        | 0,6         | 0,4         | 0,2         | 0,1        | 0,4         | 1,1 |
| Median       | 5,0         | 10,0       | 7,0        | 8,0         | 22,0        | 17,0        | 2,0        | 20,0        | 71,5|
| Mode         | 5,0         | 10,0       | 7,0        | 1,0         | 20,0        | 18,0        | 2,0        | 20,0        | 63,0|
| Std. Deviation | 1,2      | 1,9        | 1,9        | 3,9         | 3,0         | 1,3         | 0,8        | 2,9         | 7,4 |
| Variance     | 1,3         | 3,6        | 3,4        | 15,1        | 8,8         | 1,8         | 0,7        | 8,3         | 55,0|
| Range        | 5,0         | 7,0        | 8,0        | 12,0        | 13,0        | 5,0         | 3,0        | 20,0        | 30,0|
| Minimum      | 3,0         | 5,0        | 2,0        | 1,0         | 17,0        | 13,0        | 1,0        | 0,0         | 56,0|
| Maximum      | 8,0         | 12,0       | 10,0       | 13,0        | 30,0        | 18,0        | 4,0        | 20,0        | 86,0|
| Percentiles  | 25          | 5,0        | 8,0        | 7,0         | 3,5         | 20,0        | 16,0       | 2,0         | 20,0|
|              | 50          | 5,0        | 10,0       | 7,0         | 8,0         | 22,0        | 17,0       | 2,0         | 20,0|
|              | 75          | 6,0        | 11,0       | 9,0         | 11,0        | 24,3        | 18,0       | 2,0         | 20,0|

The values were homologated with their unique maximum value to obtain the percentage value (Table 2), there was a statistical difference in the sample (T test), each average is statistically different between Yes. It is observed that the lowest averages were attributed to the hypothesis section (41.6% [35.3-47.8]) and the highest corresponded to the results section (93.5% [91.4-95.7]).

---

a. There are multiple modes. The smallest value is displayed. T&A: Title and abstract. RP: Research problem. TF: theoretical framework. Hy&V: Hypothesis and Variables. MET: Methods. RDC: Results, Discussion, Conclusions. REF: References. REL: Relevance of the investigation. QOM: Quality of methodology.
Table 2
Test of a sample of the homologated values (Percentages) of the study variables.

| Test value = 0                                                                 |       |       |       |       |
|--------------------------------------------------------------------------------|-------|-------|-------|-------|
|                                                                              | t     | df    | P     | Mean  | 95% Confidence interval of the difference |
| Lower                                                                         | Upper |
| Title (%)                                                                     | 33,2  | 47    | <0,0001 | 68,75 | 64,58 | 72,92 |
| Research problem (%)                                                          | 34,7  | 47    | <0,0001 | 79,34 | 74,74 | 83,94 |
| Theoretical framework (%)                                                     | 27,1  | 47    | <0,0001 | 72,50 | 67,13 | 77,87 |
| Hypothesis (%)                                                                | 13,4  | 47    | <0,0001 | 41,55 | 35,29 | 47,81 |
| Methods (%)                                                                   | 52,2  | 47    | <0,0001 | 74,44 | 71,58 | 77,31 |
| Results (%)                                                                   | 86,9  | 47    | <0,0001 | 93,52 | 91,35 | 95,68 |
| References (%)                                                                | 18,0  | 47    | <0,0001 | 53,65 | 47,66 | 59,63 |
| Relevance (%)                                                                 | 47,0  | 47    | <0,0001 | 97,92 | 93,73 | 102,12 |
| Total (%)                                                                     | 76,3  | 47    | <0,0001 | 75,52 | 73,55 | 77,53 |

The relevance section due to its binominal characteristic (0 or 20) was rated as 0 or 100% and most of the studies were relevant (97.9% [93.7-102.1]). The box plots of each variable are presented in Figure 2.

There was a general acceptance level of "Acceptable" in 35 theses (72.9%), the Hypothesis and References sections were the ones with the greatest weakness with 70.8% and 79.2% respectively. The results section was the one that obtained the best acceptance values in 93.8% of the theses classified as "Excellent", the results are shown in Table 3. The hypothesis test proposed "the group has an equal or higher acceptable quality at 70% " compared to the acceptance level of 72.9%, the Chi² was 0.2208 with a P value = 0.6384 without statistically significant differences.
Table 3
Level of acceptance of the quality of academic research.

|                      | Excellent | Acceptable | Not acceptable |
|----------------------|-----------|------------|---------------|
| Title and abstract   | 11 (22.9%)| 9 (18.8%)  | 28 (58.3%)    |
| Research problema    | 26 (54.2%)| 15 (31.3%) | 7 (14.6%)     |
| Theoretical framework| 13 (27.1%)| 23 (47.9%) | 12 (25%)      |
| Hypotheses and Variables | 1 (2.1%) | 13 (27.1%) | 34 (70.8%)   |
| Method               | 12 (25%)  | 31 (64.6%) | 5 (10.4%)     |
| Results              | 45 (93.8%)| 3 (6.3%)   | 0             |
| References           | 5 (10.4%) | 5 (10.4%)  | 38 (79.2%)    |
| Relevance            | -         | 47 (97.9%) | 1 (2.1%)      |
| Quality              | 12 (25%)  | 35 (72.9%) | 1 (2.1%)      |

The very good association analysis between the study variables showed a statistical association between the “Hypothesis and variables” section with the general result of Quality of academic research, \( r = 0.71 \) \( P < 0.0001 \), additionally associations were reported between the methods section with the quality section. The Theoretical Framework section has an association with the Methods and References section. The data are represented in Table 4 and the best association is represented in a scattergram in figure 3.

Table 4. Association between the study variables
Discussion

The main results of this study report that the quality of academic research in the sample studied has an acceptance rate of 72.9%. A relevance of 97.9%, the worst results were observed in the Title and abstract sections, 58.3% were unacceptable, in the Hypothesis and Variables sections 70.8% were unacceptable, and in the references 79.2% were unacceptable. The “Results, discussion and conclusions” section was excellent in 93.8% of the cases and the problem statement section was excellent in 54.2% of the cases. It was possible to verify the hypothesis that the study group has an acceptance equal to 70% (Chi2 0.2, p = NS). Within the secondary analyzes, an association between “Hypothesis and Variables” and methodological quality was determined, which determines a very good degree of relationship (R = 0.71 P <0.0001). However, it must be taken into account that the risk of collinearity between these variables since the first is an important component of the second, which is a summary of the quality of the thesis. In the variables where this collinearity problem does not exist, since they are independent measurements such as the “Theoretical Framework” section and the “Methods” section, a moderate association is shown (R = 0.45, P <0.001).

The importance of the findings cited in this study determine that the quality of educational research in the institution studied has a moderate deficiency, because the expected quality level result for postgraduate and master's degrees should be equal to or greater than 95% (Summa Cum Laude), between 90 to 94% (Magna cum laude), between 85 to 89% (Cum laude), between 70 and 84% (Minimum sufficiency). (Figure 4). It is clearly observed that the hypotheses and variables section and the references section are the most affected of the research sections.
Studies with related findings are reported in Peru [1] in a postgraduate assessment of Public Health, other reports of undergraduate or nursing career are not comparable due to different educational themes.

The explanations of why the results are probably due to the deficient educational level in research methodology and to referencing weaknesses and probably to the lack of accessibility to software resources for compiling references.

These findings are relevant because it exposes the current situation of the Institution, where a result of minimum Sufficiency is achieved for the master's student.

The limitations of the study are probably due to the fact that only one public institution has been taken into account, private institutions and other postgraduate degrees from the institution are not included. Additionally, as it is a descriptive study, due to the nature of the phenomenon, it tends to represent retrospective events that limit academic-educational intervention in research.

Future research should be established with the interventional character in the sections where there are more shortcomings in order to prospectively measure the results and the increase in the quality and solidity of educational research.

**Conclusion**

The quality of educational research is equal to the 70% raised in the hypothesis, which highlights a minimum sufficiency rating for the educational research studied in this work.

**Abbreviations**

ER: educational research.

T&A: Title and abstract.

RP: Research problem.

TF: theoretical framework.

H&V: Hypothesis and Variables.

MET: Methods.

RDC: Results, Discussion, Conclusions.

REF: References.

REL: Relevance of the investigation.

QOM: Quality of methodology.
Declarations

Ethical Ethics approval and consent to participate

Does not apply to this type of study.

Publication consent

Does not apply to this type of study.

Availability of data and materials

The data sets generated and / or analyzed during the current study are not publicly available due to the confidentiality of the participants, but are available through the corresponding author upon reasonable academic request.

Competing of interest

The authors declare not to have any interest conflicts.

Financing

The authors financed the expenses incurred in the production of this research.

Authors' contributions

All authors contributed equally to this scientific article.

All authors read and approved the final version of the manuscript.

Acknowledgments

We acknowledge and thank the authorities of the Universidad de Cuenca, where the study was carried out.

Authors' information

Jorge Antonio Delgado Pauta, Doctor of Medicine and Surgery (MD) from the Universidad de Cuenca, Specialist in General Surgery from the Universidad de Cuenca, Magister in Health Research from the Universidad de Cuenca (MsC). Professor of Surgery at the Universidad de Cuenca School of Medicine.

Franklin Mora Bravo, Doctor of Medicine and Surgery from the Universidad de Cuenca (MD), Specialist in Internal Medicine from the Universidad Nacional de Loja, Higher Diploma in "University Education by Competences" from the Universidad del Azuay, Magister in Health Research from the Universidad de Cuenca (MsC), Specialist in Nephrology from the Universidad Nacional Autónoma de México. Professor of the chair of nephrology at the Universidad de Cuenca, School of Medicine.
References

1. Sanabria-Rojas H, Tarqui-Mamani C, Zárate-Cárdenas E. Calidad de las tesis de maestría en temas de salud pública. Estudio en una universidad pública de Lima, Perú. Educ Med 2011; 14 (4): 215-220.

2. Mandujano-Romero E, Grajeda P. Calidad de las tesis para obtener el título de médico cirujano, Universidad Nacional de San Antonio Abad del Cusco - Perú, 2000-2009. Acta Médica Peruana, 2013;30(2):70-74.

3. Guzmán D. Calidad de las tesis en la escuela universitaria de enfermería en Lima-Perú, período 2011-2015. Cuid salud, 2017;3(1):288-295.

4. Guzmán M, Chanvergo H, Guzmán B. Análisis científico y bibliométrico de las tesis de enfermería con la Investigación Científica Universidad Nacional Santiago Antúnez de Mayolo. Rev Aporte Santiaguino 2009;2(2):313-319.

5. Romero L. Buscando la calidad en un artículo científico. Rev. Peru. Biol. 2011;18(2): 147 – 148.

6. Carvalho J, Patino C. Critical appraisal of the literatura. Why do we care? J Bras Pneumol. 2018;44(6):448-448.

7. Salazar M. Calidad de los trabajos de investigación que se realizan para optar el título de especialista en Medicina Humana de la U.N.M.S.M. en el periodo 2000-2004. Tesis de magister. Universidad Nacional San Marcos. 2007, Lima-Perú.

8. Zavaleta-Reyes C, Tresierra-Ayala M. Calidad metodológica del trabajo de grado de bachiller en una facultad de medicina. Educ Med. 2017;18(4):233-241. DOI: 10.1016/j.edumed.2016.06.020.

9. Cash R, Wikler D, Saxena A, Capron A. Estudios de casos sobre ética de la investigación internacional en salud. Organización Panamericana de la Salud. Organización Mundial de la Salud. Editorial Astrid Stuckelberger y Philippe Chastonay, Université de Genève. Washington 2009. ISBN 978-92-75-31819-5.

Figures
Figure 1

Problem tree of the low quality of educational research
Figure 2
Box plots of the standardized study variables.

Figure 3
Dispersogram between the variable Hypothesis and Variables and Methodological Quality

Figure 4
Pictogram for the classification of educational research according to the degree of sufficiency for masters and doctorates.