

*Allied Health Undergraduate Research of De La Salle Health Sciences Institute:
A Content Analysis*

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Abstract

Educational institutions actively contribute to the research base of a profession through the scholarly outputs produced by their graduates. The content of these outputs reflects the research thrust of the institution and the quality of the researches written. This study analyzed the content of theses submitted to Nursing, Physical Therapy, and Medical Radiation Technology undergraduate programs offered by De La Salle Health Sciences Institute in terms of topics researched, research methods employed, and statistical analysis techniques utilized. It compared how the allied health undergraduate theses aligned with the Philippine National Unified Research Agenda (NUHRA) 2011-2016. Content analysis was used to analyze the undergraduate theses. Research topics were coded using Medical Subject Headings (MeSH). The research method and the statistical analysis techniques used were recorded.

Findings of the study revealed that Physical Therapy theses tend to concentrate on topics related to the practice of the profession, including clients or patients while Nursing and Medical Radiation Technology theses tend to contribute to micro-level issues of students as well psychological issues of population groups. Most undergraduate theses preferred to use survey and correlation to describe and infer relationships and utilize descriptive statistics such as frequency distribution and mean, relative to the use of survey as the method of research. Most of the topics frequently studied by Physical Therapy theses were observed to be aligned with NUHRA 2011-2016. While a number of the topics researched the most by Nursing and Medical Radiation Technology theses matched the national health research agenda, the most investigated topics dealt with coping strategies and student experiences and were not aligned with the national research agenda.

Keywords: undergraduate theses, allied health, content analysis

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Introduction

Colleges and universities are esteemed institutions of higher learning that are expected to mold and support research, alongside teaching and learning. To develop an intuitive mind among its graduates and to contribute to the research base of the professions, students are required to produce a thesis as an evidence of their scholarly output. More than an academic requirement to obtain a degree, these outputs reflect the research thrusts and priorities of the institution as well as the quality of researches produced.

This study focused on analyzing the content of theses submitted to the undergraduate programs of a higher education institution in terms of topics researched, research methods employed, and statistical analysis techniques utilized, and compared how these researches align with the research priorities set in a national research agenda. These variables reflect the focus and the priorities of the institution as well as the quality of the research outputs that its graduates produce on micro and macro levels.

Background of the Study

Theses as Research Outputs of Undergraduate Students

De La Salle Health Sciences Institute is a premier institution of higher learning for the medicine and allied health and deems research as among the significant components of academic education. This is reflected in its mission which states that it seeks to be the “leading institution of excellence in health professions education, health care and research” (De La Salle Health Sciences Institute, n.d.). It is also evidenced through requiring the undergraduate students of the Institute to produce a thesis as part of the requirements to obtain their undergraduate degrees.

Among the early undergraduate programs offered by the Institute are Bachelor of Science in Nursing, Bachelor of Science in Physical Therapy, and Bachelor of Science in Medical Radiation Technology. Since the inception of these programs, theses have been part of the students’ academic requirement. These make up a considerable contribution to the research base of the professions for many years.

Trends in Nursing, Physical Therapy, and Radiology Research

Several studies identified trends in research in nursing, physical therapy, and radiology. Loomes (1985) reported that clinical nursing was researched the most among nursing dissertations from 1976 to 1982. Traynor, Rafferty, and Lewison (2001) noted that among UK nursing journals published from 1988 to 1995, mental health issues were studied the most, followed by education for nurses. Borbasi, Hawes, Wilkes, Stewart, and May (2002) identified education of nurses and practice issues relating to patient care to be studied the most while “scant attention was paid to major Australian health issues” by Australian authors who published in nursing journals from 1995 to 2000. In their study of Portuguese nursing theses and dissertations from 2000 to 2010, Baggio, Rodrigues, Erdmann, Figueiredo, M. and Vieira (2014) observed that older adult, the family, the adolescent, and obstetrics were researched the most, qualitative methods were utilized most often, and almost half of the theses

and more than half of the dissertations did not explicitly state the statistical analysis used.

Wiles, Matricciani, Williams, and Olds (2012) found out that among physical therapy articles published from 1945 to 2010, there had been a decline in studies with keywords acute care, clinical therapy and wound management, and sports physical therapy. They noted that researches that used cross-sectional designs, randomized control trials, case studies, and uncontrolled experiments increased while qualitative methods were observed to be utilized in few studies. Inferential statistics were used increasingly over the years, the authors added.

CT or MR imaging was recorded to be studied the most among articles published in two major radiology journals from 2001 to 2010, as observed by Kyoung, J. A. et al. (2012).

Philippine National Research Agenda

To guide the research initiatives at a national level, the Philippine National Health Research System (PNHRS) prepared the National Unified Health Research Agenda (NUHRA). NUHRA 2011-2016 (2011) explained that the “health research priorities [were] perceived as relevant to the country’s public health situation particularly addressing the health issues of the poor and disadvantaged segments of the population.” This document is significant in consolidating the research efforts of sectors involved in health research towards common goals of improving the state of Philippine public health and responding to national health issues. Filipino masses would benefit from this agenda because it prioritizes the health concerns of the poor and the disadvantaged, who make up a large chunk of the Filipino society and most of whom could not afford private medical care.

NUHRA 2011-2016 lists 4 major research areas with specific priority topics listed under each area. Table 1 summarizes the priority topics.

Table 1
NUHRA 2011-2016 Research Priorities

Research Area	Specific Research Priorities
Health technology development	Diagnostics Genomics/Molecular technology Drug discovery and development Functional foods Hospital Equipment and Biomedical Devices Information and Communication Technology (ICT) for Health
Health financing	Financial Risk Protection
Health service delivery	Improving access to quality hospitals and health care facilities Improving provision of public health services
Socio-environmental health concerns	Environmental and climate change Health social sciences (including community development)

Methodology

The study is descriptive and employs content analysis as the research method. Research topics were coded based on Medical Subject Headings (MeSH). It is a controlled vocabulary prepared by the National Library of Medicine composed of 16 categories and each category is divided into subcategories. Subcategories are further subdivided into descriptors. The topic discussed by each thesis was checked against the MeSH browser (<https://www.nlm.nih.gov/mesh/MBrowser.html>) in 2015. The MeSH descriptor that appropriately represents the topic discussed in the thesis was recorded in the worksheet. The subcategory where the descriptor fell under was also noted. A thesis may have more than one topic and may be assigned with more than one MeSH descriptor.

Research method and statistical analysis technique stated in the body of the research were listed. In cases where the research method was not explicitly stated, the topic, instrument, statistical analysis employed were used as bases to determine the method. For example, studies about “level of awareness”, “level of knowledge”, and “patient satisfaction” that aimed to describe the phenomenon and employed questionnaire as the instrument and frequency distribution, mean, f-test, ANOVA as statistical analysis techniques were considered to utilize survey as the research method.

Data was recorded in MS Excel. Frequency distribution was employed to statistically analyze the data.

A total of 2,035 theses submitted as part of the academic requirements for Bachelor of Science in Nursing, Bachelor of Science in Physical Therapy, and Bachelor of Science in Medical Radiation Technology that are physically available at the Romeo P Arinigeo MD Library were included in the study. Table 2 presents the number of theses included in the study by program.

Table 2
Number of theses by program

Program	Inclusive years	Number of theses
Nursing	1987-2015	943
Physical Therapy	1989-2015	722
Medical Radiation Technology	1989-2015	370
Total		2035

Results

Topics Researched the Most

There were 66 topics found to be researched among Nursing theses. Majority of the researches delved into psychological adaptation or coping strategies. Studies about mothers ranked second, followed by studies about nursing care, clinical clerkship or internship of nursing students, and achievement or academic performance of nursing students. Table 3 presents the top 5 topics researched the most by Nursing theses.

Table 3
Top 5 topics researched by Nursing theses

Rank	Topic
1	F01, particularly Adaptation, Psychological
2	M01, particularly Mothers
3	E02, particularly Nursing Care
4	I02, particularly Clinical Clerkship
5	F02, particularly Achievement

There were 47 topics observed to be studied by Physical Therapy theses. Most of the researches examined disabled persons, followed by musculoskeletal diseases. Studies about rehabilitation, therapeutics, and exercise ranked third, followed by researches about stroke and health education. Studies on clinical clerkship or internship of physical therapy students ranked fifth. Table 4 presents the top 5 topics researched the most by Physical Therapy theses.

Table 4
Top 5 topics researched by Physical Therapy theses

Rank	Topic
1	M01, particularly Disabled Persons
2	C05, particularly Musculoskeletal Diseases
3	E02, particularly Rehabilitation, Therapeutics, Exercise
4	C14, particularly Stroke N02, particularly Health Education
5	I02, particularly Clinical Clerkship

Among the 51 topics researched by Medical Radiation Technology theses, studies about clinical clerkship or internship of medical radiation technology students ranked first, followed by studies about achievement or academic performance and researches about attitude and behavior. Studies about radiographic procedures such as X-ray, mammography, and imaging ranked fourth while studies about patient care and community health ranked fifth. Table 5 presents the top 5 topics researched the most by Medical Radiation Technology theses.

Table 5
Top 5 topics researched by Medical Radiation Technology theses

Rank	Topic
1	I02, particularly Clinical Clerkship
2	F02, particularly Achievement
3	F01, particularly Attitude, Behavior
4	E01, particularly Radiographic Procedures
5	N02, particularly Patient Care, Community Health

Nursing theses had the most varied topics researched, possibly due to having the most number of theses submitted to the library. The variety of topics researched reflects a

wide spectrum of disciplines that interest the students. Although there were a number of Physical Therapy theses included in this study, these had the least number of varied topics covered.

Most of the Nursing and Medical Radiation Technology theses delved into the experiences encountered by students during internship or clinical clerkship and described the academic performance or school achievement of students as well as coping strategies of students and the certain population groups. This reflects that more focus is afforded to the experiences of students. There were less researches that emphasized professional experience such as nursing care, patient care, community health, and radiographic procedures.

On the other hand, Physical Therapy theses tend to concentrate on topics related to the practice of the profession such as disabled persons, musculoskeletal diseases, rehabilitation, therapeutics, exercise, and stroke. However, studies about the experiences of students during internship were noted to be investigated often, consistent with the observation with Nursing and Medical Radiation Technology theses.

Research Methods Utilized the Most

Nursing theses were observed to use 8 research methods, including qualitative studies that did not explicitly state the method utilized. Survey ranked first, followed by correlation, and phenomenological. Quasi-experimental ranked fourth while qualitative studies ranked fifth. Table 6 presents the top 5 methods used the most by Nursing theses.

Table 6
Top 5 research methods used by Nursing theses

Rank	Method
1	Survey
2	Correlation
3	Phenomenological
4	Quasi-experimental
5	Qualitative studies, including symbolic interactionism

There were 11 research methods observed to be used among Physical Therapy theses. These include qualitative studies that did not explicitly state the method utilized as well as studies that did not state any method used. Survey was observed to be used the most, followed by case study and correlation. Experimental and quasi-experimental ranked fourth and fifth, respectively. Table 7 presents the top 5 methods used the most by Physical Therapy theses.

Table 7
 Top 5 research methods used by Physical Therapy theses

Rank	Method
1	Survey
2	Case study
3	Correlation
4	Experimental
5	Quasi-experimental

Medical Radiation Technology theses were noted to employ 7 research methods, including qualitative studies that did not explicitly state the method utilized. Survey was the top research method used, followed by correlation and phenomenological. Quasi-experimental and qualitative studies both ranked fourth while mixed method and observation ranked fifth. Table 8 presents the top 5 methods used the most by Medical Radiation Technology theses.

Table 8
 Top 5 research methods used by Medical Radiation Technology theses

Rank	Method
1	Survey
2	Correlation
3	Phenomenological
4	Quasi-experimental Qualitative studies
5	Mixed Observation

Physical therapy theses were observed to employ more varied research methods than Nursing and Medical Radiation Technology theses. Survey and correlation were the consistent top choice of research methods across all theses. This reflects the propensity of the undergraduate theses to prefer descriptive studies that aim to describe the occurrence of a phenomena or the relationship between variables. The simplicity of these methods may have appealed to the students to prefer these over more rigorous and in-depth methods, such experimental and quasi-experimental.

Qualitative studies, including case study and phenomenological, were noted to be used considerably among the undergraduate theses. These studies tend “to emphasize on quality rather than quantity by understanding why do people do the things they do,” as Goyal (2013) described the purpose of qualitative studies.

On the other hand, a small number of undergraduate theses considered using experimental and quasi-experimental methods to present causality and not just to describe an event or present relationships between variables.

While most undergraduate theses preferred to use survey and correlation to describe and infer relationships, it is interesting to note that there were researches that employed methods that provide in-depth analysis by identifying causality, such as in experimental and quasi-experimental studies, and by focusing on qualitative measures.

Statistical Analysis Techniques Used the Most

Among the Nursing theses analyzed, there were 23 statistical analysis techniques employed. Descriptive statistics such as frequency distribution and mean were utilized the most while inferential statistics such as t-test and ANOVA ranked third and fourth, respectively. Correlation test such as Pearson correlation coefficient ranked fifth. Table 9 presents the top 5 statistical analysis techniques utilized the most by Nursing theses.

Table 9
Top 5 statistical analysis techniques utilized by Nursing theses

Rank	Statistical Analysis Technique
1	Frequency distribution
2	Mean
3	t-test
4	ANOVA
5	Pearson correlation coefficient

There were 20 statistical analysis techniques recorded to be utilized by Physical Therapy theses. Majority of the theses employed frequency distribution and mean while t-test ranked third among the top statistical analysis techniques employed. There were a number of qualitative studies, including case study, that did not employ any statistical analysis technique thus, researches that had did not use statistical analysis ranked fourth. Standard deviation was in fifth place. Table 10 presents the top 5 statistical analysis techniques utilized the most by Physical Therapy theses.

Table 10
Top 5 statistical analysis techniques utilized by Physical Therapy theses

Rank	Statistical Analysis Technique
1	Frequency distribution
2	Mean
3	t-test
4	None
5	Standard deviation

There were 21 statistical analysis techniques observed to be used among Medical Radiation Technology theses. Frequency distribution and mean were the top statistical analysis techniques used. ANOVA and t-test ranked third and fourth, respectively. Standard deviation ranked fifth. Table 11 presents the top 5 statistical analysis techniques utilized the most by Medical Radiation Technology theses.

Table 11

Top 5 statistical analysis techniques utilized by Medical Radiation Technology theses

Rank	Statistical Analysis Technique
1	Frequency distribution
2	Mean
3	ANOVA
4	t-test
5	Standard deviation

The undergraduate theses were observed to employ a variety of descriptive and inferential statistics to analyze data, reflecting the attempt among students to enrich their research through the use of different statistical analysis techniques. However, there is a propensity for the theses to employ descriptive statistics more than inferential ones, such as the use of frequency distribution, mean, and standard deviation. ANOVA and t-test were also observed to be heavily used because most of the survey studies tend to employ such techniques.

Pearson correlation coefficient was among the top statistical analysis techniques employed by Nursing theses, coinciding with correlation as among the top methods used by the Nursing theses. A number of Physical Therapy theses did not employ any statistical analysis technique, relative to the number of the theses that employed case study and qualitative methods.

The choice of statistical analysis techniques depend on the research method used by the theses. As most of the theses employed survey as the research method, descriptive statistics such as frequency distribution, mean, and standard deviation were also observed to be utilized more than other statistical techniques.

Comparison of Topics Researched the Most against NUHRA 2011-2016

The topics researched by undergraduate theses submitted from academic year 2011 to 2015 were collected and compared against NUHRA 2011-2016 to determine how the theses align with the national research agenda. A total of 353 theses were included.

Among the top topics researched the most by Nursing theses, only 3 topics matched the NUHRA 2011-2016 Research Agenda. Studies on mothers and pregnancy support the improvisation of maternal health while researches on nursing care complement the improvisation of health care outlined in Agenda 3. Table 12 presents the top 5 topics researched by Nursing theses, AY 2011-2015 and the NUHRA 2011-2016 Agenda Match.

Table 12

Top 5 topics researched by Nursing theses, AY 2011-2015

Rank	Topic	NUHRA 2011-2016 Agenda Match
1	F01, particularly Adaptation, Psychological	
2	M01, particularly Mothers	Agenda 3: Health Service Delivery Improving provision of public health services
3	E02, particularly Nursing Care	Agenda 3: Health Service Delivery Improving access to quality hospitals and health care facilities
4	F02, particularly Achievement	
5	G08, particularly Pregnancy, Pregnancy in Adolescence I02, particularly Clinical Clerkship	Agenda 3: Health Service Delivery Improving provision of public health services

Majority of the top research topics studied by Physical Therapy theses were observed to align with NUHRA 2011-2016. Topics that deal with the improvisation of health services not only for the public but also for special population groups outlined in Agenda 3 were observed to be investigated often. These include studies on rehabilitation, therapeutics, exercise, musculoskeletal diseases, stroke, and disabled persons. Studies on remote consultation and telehealth were also noted to complement Agenda 1 regarding the use of health technology. Table 13 presents the top 5 topics researched by Physical Therapy theses, AY 2011-2015 and the NUHRA 2011-2016 Agenda Match.

Table 13

Top 5 topics researched by Physical Therapy theses, AY 2011-2015

Rank	Topic	NUHRA 2011-2016 Agenda Match
1	I03, particularly Exercise, Activities for Daily Living	Agenda 3: Health Service Delivery Improving provision of public health services
2	I02, particularly Clinical Clerkship M01, particularly Disabled Persons	Agenda 3: Health Service Delivery Improving provision of public health services
3	E02, particularly Rehabilitation, Therapeutics, Exercise	Agenda 3: Health Service Delivery Improving provision of public health services
4	F01, particularly Patient Compliance	
5	C05, particularly Musculoskeletal Diseases C14, particularly Stroke N04, particularly Remote Consultation	Agenda 3: Health Service Delivery Improving provision of public health services Agenda 1: Health Technology Development Information and Communication Technology (ICT) for Health

Among the research topics studied the most by Medical Radiation Technology theses, a number of these were found to align with NUHRA 2011-2016. Studies about radiographic protection, infection control, and waste management support Agenda 4: Socio-environmental Health Concerns which deal with environment control to reduce infection and disease. Researches about tuberculosis, patient care, and community health complement Agenda 3: Health Service Delivery that emphasize on improvisation of public health services and community health. However, note that these topics were not among the top 2 topics researched the most by Medical Radiation Technology theses. Table 14 presents the top 5 topics researched by Medical Radiation Technology theses, AY 2011-2015 and the NUHRA 2011-2016 Agenda Match.

Table 14
Top 5 topics researched by Medical Radiation Technology theses, AY 2011-2015

Rank	Topic	NUHRA 2011-2016 Agenda Match
1	F01, particularly Attitude, behavior I02, particularly Clinical Clerkship	
2	E01, particularly Radiographic procedures	
3	N06, particularly Radiographic protection, infection control, waste management	Agenda 4: Socio-environmental Health Concerns Environmental and climate change
4	C01, particularly Tuberculosis, Communicable diseases	Agenda 3: Health Service Delivery Improving provision of public health services
5	E02, particularly Self-care N02, particularly Patient care, Community health	Agenda 3: Health Service Delivery Improving access to quality hospitals and health care facilities

Among the undergraduate theses, most of the topics frequently investigated by Physical Therapy theses were observed to be aligned with NUHRA 2011-2016 Agenda 3 Health Service Delivery, specifically health services for the public and special population groups.

Some of the most researched topics by Nursing and Medical Radiation Technology theses were observed to match NUHRA 2011-2016 Agenda 3 Health Service Delivery. However, the topics researched the most by the theses did not complement the national research agenda, which are coping strategies and student experiences during internship.

Several Physical Therapy theses dealt with Agenda 1: Health Technology Development while some Medical Radiation Technology theses delved on Agenda 4: Socio-environmental Health Concerns. In contrast, the Nursing theses that matched NUHRA 2011-2016 focused on Agenda 3: Health Service Delivery alone.

Considering the research method employed by the undergraduate theses, these were found to complement NUHRA 2011-2016 Agenda 3: Health Service Delivery,

specifically the implementation of provincial-level public health surveys. A number of these were observed to involve the public populace of cities and municipalities of Cavite as respondents and the collection of demographic data.

Conclusion

Based on the data gathered, the following conclusions were presented:

1. Nursing theses had the most varied topics researched, reflecting a wide spectrum of disciplines that interest students. These also had the most number of theses included in this study. Physical therapy theses tend to have the least variety of topics investigated, reflecting a more focused research interest among students.
2. Most of the Nursing and Medical Radiation Technology theses delved into the experiences encountered by students during internship and described the students' academic performance as well as coping strategies of students and the certain population groups. This reflects that more focus is afforded to student experience while less emphasis on professional experience and practice. In contrast, Physical Therapy theses tend to concentrate on topics related to the practice of the profession, including clients or patients. Physical Therapy theses tend to contribute more to the national health issues while Nursing and Medical Radiation Technology theses tend to contribute to micro-level issues of students as well coping issues.
3. Physical therapy theses were observed to employ more varied research methods than Nursing and Medical Radiation Technology theses.
4. Most undergraduate theses preferred to use survey and correlation to describe and infer relationships. However, it is notable that there were researches that employed methods that provide in-depth analysis by identifying causality, such as in experimental and quasi-experimental studies, and by focusing on qualitative measures. The simplicity and ease of the survey and correlation methods may have appealed to the researchers more than the other research methods that require time and rigor to conduct.
5. Undergraduate theses were observed to employ a variety of descriptive and inferential statistics to analyze data, reflecting the attempt among students to enrich their research through the use of different statistical analysis techniques.
6. As most of the theses employed survey as the research method, descriptive statistics such as frequency distribution, mean, and standard deviation were also observed to be utilized more than other statistical techniques. ANOVA and t-test were also observed to be heavily used because most of the survey studies tend to employ such techniques.
7. Pearson correlation coefficient was among the top statistical analysis techniques employed by Nursing theses, coinciding with correlation as among the top methods used by the said theses. A number of Physical Therapy theses did not employ any statistical analysis technique, relative to the number of the theses that employed case study method. This reflects that the statistical analysis techniques employed depends on the methodology utilized.
8. Most of the frequently researched topics among Physical Therapy theses were observed to be aligned with NUHRA 2011-2016 Agenda 3 Health Service Delivery, specifically public health services to the general population and special population groups. While a number of the top topics investigated by

Nursing and Medical Radiation Technology theses were observed to be aligned with NUHRA 2011-2016 Agenda 3 Health Service Delivery, the most researched topics, which dealt with coping strategies and student experiences during internship, did not match the national health research agenda.

9. A number of the undergraduate theses were observed to involve the public populace of cities and municipalities of Cavite as respondents and the collection of demographic data. This complements the implementation of provincial-level public health surveys outlined in NUHRA 2011-2016 Agenda 3 Health Service Delivery.

Recommendations

Based on the above conclusions, the following recommendations are offered:

1. The Physical Therapy program is encouraged to continue supporting researches that delve on professional practice as these topics complement the national research agenda for the benefit of the general and special population groups.
2. The Nursing and Physical Therapy programs may want to consider shifting the thrust of the researches produced by their students towards topics on professional and clinical practice instead of student internship and coping in consonance with the national research agenda for the benefit of a bigger part of society and not just the limited populace.
3. The programs are encouraged to explore the use of research methods other than survey and correlation to contribute a deep and different understanding about phenomena other than describing them or identifying relationships. There is a rich potential in using other methods as evidenced by the theses that employed qualitative and experimental methods.
4. The use of research methods other than the conventional survey and correlation would lend to the utilization of more varied inferential statistical analysis techniques to further enrich the research and yield new perspectives.
5. Continuous analysis of the content of the undergraduate researches submitted to the Institute is encouraged to track the research thrusts as well as improvements or gaps in the research.

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