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CURRICULUM INTEGRATION OF RESEARCH SKILLS IN NURSING: ANALYSIS OF A CHILEAN PRIVATE UNIVERSITY

INTEGRACIÓN CURRICULAR DE HABILIDADES INVESTIGATIVAS EN ENFERMERÍA: ANÁLISIS DE UNA UNIVERSIDAD PRIVADA CHILENA

INTEGRAÇÃO CURRÍCULA DE HABILIDADES DE PESQUISA EM ENFERMAGEM: ANÁLISE DE UMA UNIVERSIDADE PRIVADA DO CHILE

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ABSTRACT

Introduction: Universities, in addition to transferring knowledge, must generate it. To this end, they should train students who are capable of learning autonomously in order to contribute to society. Chile produces less than 7% of the total scientific production of Latin America in the field of health. Scientific training allows citizens to find solutions to contemporary problems. **Objective:** To analyze the development of research skills in the Nursing curriculum of a private university. **Methodology:** Evaluative intrinsic case study. **Results:** The 28 syllabi that were analyzed from subjects belonging to the nursing discipline show 216 references to research skills in the first eight semesters of the career. These references were identified in the learning outcomes, assessment methodologies, classroom-based activities, workshops, and personal work. Of the total references, 72% are addressed in the seventh and eighth semesters, the year the undergraduate dissertation is designed and completed. **Conclusions:** The analyzed curriculum methodologically addresses all research skills in its ten semesters. However, there is a lack of progressive and continuous development before the research methodology subject is taught in the seventh semester.

Keywords: Research; Nursing Research; Curriculum; Education; Nursing Students.

RESUMEN

Introducción: Las universidades además de transferir conocimiento, lo generan; para lo cual deben formar estudiantes capaces de aprender de manera autónoma para aportar a la sociedad. De la producción científica de América Latina en la línea de salud, Chile produce menos del 7% del total. La formación científica permitirá que la ciudadanía encuentre solución a las problemáticas contemporáneas. **Objetivo:** Analizar el desarrollo de habilidades investigativas en el currículo de la carrera de Enfermería de una universidad privada. **Metodología:** Estudio de caso intrínseco evaluativo. **Resultados:** Los 28 programas de asignatura disciplinar analizados tienen, en los ocho primeros semestres de la carrera, 216 tributaciones a habilidades investigativas, tributaciones identificadas en: resultados de aprendizajes, metodologías evaluativas, actividades en aula, taller y trabajo personal. Del total de tributaciones, un 72% son tributadas en el 7tmo y 8vo semestre, año donde se diseña y ejecuta la tesis de pregrado. **Conclusiones:** La malla curricular analizada, tributa metodológicamente, en sus 10 semestres, a todas las habilidades investigativas, no obstante, no hay un desarrollo progresivo y continuo previo a la asignatura de metodología de la investigación impartida en el séptimo semestre.

Palabras clave: Investigación; Investigación en Enfermería; Curriculum; Educación; Estudiantes de Enfermería.

RESUMO

Introdução: As universidades, além de transferir conhecimento, o geram; para o qual devem formar estudantes capazes de aprender de forma autônoma para contribuir com a sociedade. Da produção científica da América Latina na área da saúde, o Chile produz menos de 7% do total. A formação científica permitirá aos cidadãos encontrar soluções para os problemas contemporâneos. **Objetivo:** Analisar o desenvolvimento de habilidades investigativas no currículo da carreira de enfermagem de uma universidade privada. **Metodologia:** Estudo de caso avaliativo intrínseco. **Resultados:** Os 28 programas disciplinares analisados têm, nos primeiros 8 semestres do curso, 216 impostos sobre habilidades investigativas, impostos identificados em: resultados de aprendizagem, metodologias de avaliação, atividades de sala de aula, oficina e trabalho pessoal. Do total de impostos, 72% são tributados no 7º e 8º semestre, ano em que o trabalho de conclusão de curso é elaborado e executado. **Conclusão:** O currículo analisado contempla metodologicamente, em seus 10 semestres, todas as competências investigativas, porém, não há um desenvolvimento progressivo e contínuo anterior à disciplina de metodologia de pesquisa ministrada no sétimo semestre.

Palavras-chave: Pesquisa; Pesquisa em Enfermagem; Currículo; Educação; Estudantes de Enfermagem.

INTRODUCTION

Universities, in any society, are not only in charge of transmitting knowledge but also of generating it; this is especially true in current times, where knowledge is subject to constant and progressive modifications. In order to adapt to these changes, higher education establishments should focus on training students who are capable of autonomous learning, by providing them with tools that allow them to “learn how to learn” continuously, even after graduating. Only in this way will universities contribute to society with professionals who are capable of leading the permanent dynamics occurring at the socioeconomic, political, scientific, and global levels.[1]

Chile's scientific production ranks fourth in Latin America, falling behind Brazil, Mexico, and Argentina. In these three countries, the field of health is among the five areas with the greatest

scientific production. In contrast, the areas in Chile that have the highest level of scientific production are the biological sciences, biotechnology, urban planning, geology, agriculture, and political sciences.[2] When analyzing the production of health sciences in Latin America specifically, from a total of 20 countries, Brazil is in the lead with 58.55%, followed by Cuba (10.52%), and Colombia (8.3%), leaving Chile in fourth place, with 6.09%.[3]

According to the International Council of Nurses (ICN) and MINSAL (Chilean Department of Health), research is one of the essential functions of the Nursing profession, as well as an important part of its graduate profile.[4,5] To make the most of the discipline's literature, it is fundamental to create instruments that assess research skills and how they are incorporated into the curriculum. This will increase methodological rigor and contribute to the development of the discipline, as well as benefit clients and the health system.[6]

Undergraduate programs should not base their research training solely on teaching about methodology. If this were the case, the degree to which these institutions are training professionals who can assume the socio-sanitary challenges of the 21st century would be questionable. Academic instruction must be understood as a social literacy process that should be promoted even in primary and secondary education. Scientific training, understood as the ability to generate knowledge, will allow citizens to achieve scientific knowledge and technology through innovation, and find solutions to contemporary problems and demands, thus advancing social development and improving the population's quality of life.[7]

In Chile, Nursing is a profession taught only in universities.[5] After approving eight semesters and defending their undergraduate dissertation, students receive a bachelor's degree in nursing. After completing 10 semesters, they receive a professional degree in Nursing.

A conceptual differentiation between development and training is proposed, where "...training is the stage in which students consciously learn modes of action under the adequate direction of teachers or professors... Development is the stage where, once the modes of action are acquired, the process of practice begins."[8] The development of research skills is the transversal axis of research training because it allows students to integrate knowledge as a foundation for permanent self-learning or self-training. In turn, this allows them to systematically update their knowledge and solve the problems and contradictions found in work and science in certain social contexts, based on evidence-based practice.[9-13]

In this sense, assessing research skills is considered relevant given how crucial the production of scientific knowledge is for the comprehensive development of any country. Moreover, it is suggested to thoroughly assess the students' skills throughout the curriculum.[14] Beyond elaborating hypotheses, problems, or designs, what should develop is hypothetical and problem-focused thinking, tools that can be applied to any event in professional life as a holistic way of practicing. Several classifications are proposed for this.[15]

A profile of research skills was created in 1995 through a documentary inquiry of different experts, one way, among many, of conceiving the profile, which in this case responds to a logic that is sustained on a theoretical perspective and assumptions.[10] This profile is comprised of seven hubs: Hub A (perception skills), hub B (instrumental skills), hub C (thought skills), hub D (conceptual construction skills), hub E (methodological construction skills), hub F (skills for the social construction of knowledge), and hub G (metacognitive skills).

Perception skills are the gateway to knowledge processes. Although they are inherently human skills, it is important to intentionally develop them at every level of academic training. Instrumental skills are the basis for cognitive processes that are used to reach certain objectives; the degree to which

these are practiced will result in a higher level of competency, which in turn will permit future learning. In the third place we have thought skills, which are the evidence that an individual has reached the necessary intellectual maturity to perform more complex tasks such as research. These three skills are the foundations for human development in family, academic, professional, and social contexts, and it is expected that people develop them in the first 15 years of their education. Hubs D, E, and F represent the skills involved in practices closely related to the research process; their growth derives precisely from the actions carried out in this process and its partial products. Finally, hub G includes tasks for the control and evaluation of knowledge produced during research, where metacognition is the awareness of one's own reflections. These skills are acquired mainly at the postgraduate level.[10]

These categories show that research skills are a transversal axis of the training process. Developing these skills makes it possible to integrate knowledge and supports constant self-learning, which will allow the graduate to self-train and systematically update their knowledge. These competencies are highly demanded in the labor market today.[12]

The mission of the university to which the analyzed nursing curriculum belongs explicitly mentions that it will contribute to the development of people, among other things, by providing spaces for creation and research that allow them to participate in the conversation about society's issues. Its vision reflects a good-quality university with growing levels of academic development and institutional complexity. This is replicated by the school in which the nursing degree is taught, which in its mission states that it will provide students with a comprehensive university experience that includes training, applied research, and public engagement, thus generating knowledge and innovation. In its vision, it explicitly refers to being recognized as a referent for university innovation.

The purpose of this case study is to analyze the development of research skills in the nursing curriculum of a private university.

METHODOLOGY

This research was developed using a descriptive case study methodology, given the nature of this type of research report.[16]

Regarding the sample, the materials used for this study were the syllabi of subjects belonging to the nursing curriculum of a private university in Chile, up to the year 2022. Twenty-eight subjects taught in the first eight semesters of the career, conducive to a bachelor's in nursing, were analyzed.

As for inclusion criteria, syllabi belonging to the discipline, that is, subjects designed and taught by the School of Nursing, were included. Subjects taught in the ninth and tenth semesters, which correspond to the practicum and preparation for the degree examination, were excluded.

The instrument used for assessment was a matrix that allowed cross-checking of the data (Table 1), which was validated by expert judgment. The collection technique involved analysis through descriptors, evaluating the presence of research skills[10] in the nursing curriculum, in six areas if applicable:

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Table 1: Research Skills/Subject Syllabus Matrix, N:28, Chile, 2022.

Subject Syllabus		First Aid					
Abbreviation		ENF110					
Semester		First Semester					
Total Credits		2					
Lecture Hours		18					
Workshop Hours		18 (CESS [Clinical simulation training center])					
Practicum		0					
Individual Work Hours		18					
Total Hours		54					
Skill Development Diagnosis		Lecture Learning Outcomes	Lecture Assessment Methodology	Workshop Assessment Methodology (Not in CESS)	Lecture Activities	Personal Work Activities	Workshop Activities (Not in CESS)
Conceptual Construction Skills	Appropriate and reconstruct the ideas of others						
	Generate ideas						
	Logically organize, expose, and defend ideas						
	Problematize						
	Unravel and semantically elaborate (construct) a study objective						
	Perform a creative conceptual synthesis						
Methodological Construction Skills	Establishing the research method						
	Making the knowledge construction method relevant						
	Constructing observable variables						
	Designing procedures and instruments to search for, retrieve, and/or generate information						
	Handle and/or design techniques for information organization, systematization, and analysis						
Skills for the Social Construction of Knowledge	Working in a Group						
	Socializing the knowledge construction process						
	Socializing knowledge						
	Communicating						

Source: Own elaboration, based on Moreno's codification.[10]

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- Learning outcomes of the lectures.
- Lecture assessment methodology.
- Workshop assessment methodology.
- Activities described for the lecture (classroom).
- Activities described for workshops.
- Activities described for personal work.

Since this study focused on the syllabi of university subjects, the analysis was centered around Moreno's D, E, and F hubs. The author establishes the research skills profile through hubs, each of them representing different skills that serve as descriptors for evaluation. Hub D is conceptual construction, within which six skills are described: Appropriation and reconstruction of ideas of others; generating ideas; logically organizing, exposing, and defending ideas; problematizing; unraveling and semantically elaborating (constructing) a study objective, and carrying out a creative conceptual synthesis. Hub E refers to methodological construction and incorporates five skills: establishing the research method; constructing observable variables; designing procedures and instruments to search for, retrieve, and/or generate knowledge; handling and/or designing techniques for the organization, systematization, and analysis of information. Hub F is the social construction of knowledge and is comprised of four skills: working in groups, socializing the process of knowledge construction, socializing knowledge, and communicating.[10]

A descriptive statistical analysis of the information was carried out using Microsoft Excel in its Office 365 version.

Regarding ethical aspects, this study was approved by the Scientific Research Ethics Committee of Universidad Central, registration number 79/2022, dated August 4, 2022. The evaluation waived the requirement of informed consent due to the use of institutional documents and records. In addition, authorization letters were provided both by the director of the department where the activity was carried out and the director of the program, where this project was developed as a requirement for graduation.

RESULTS

The first two columns of Table 2 show the number of research skills that are addressed by the learning outcomes described in the syllabi. The six conceptual construction skills are found 26 times in the learning outcomes of the syllabi in the first eight semesters. Of these, 14 are addressed in semesters seven and eight, and 12 in the first six semesters. The methodological construction skills are addressed 11 times in the learning outcomes of the first eight semesters. Of those 11 times, ten correspond to semesters seven and eight, and one can be found within the first six semesters. The skills for the social construction of knowledge appear only in the learning outcomes of semesters seven and eight, that is, the semesters where the subject of research methodology and undergraduate dissertation is taught. In total, research skills appear 43 times in the syllabi's learning outcomes, of which 30% are addressed during the first six semesters and 70% in semesters seven and eight.

When analyzing the activities carried out in the classroom (third and fourth columns), both for lectures and workshops, the results are the following: The six skills are addressed 37 times in the first eight syllabi, 21 of those times corresponding to the seventh and eighth semesters. The "problematizing" activity is addressed the most among the 15 analyzed research skills, being found in 16 out of the 28 syllabi. Regarding methodological construction skills, 14 references were found in the first eight semesters, 12 of which correspond to lectures and workshops in semesters seven and eight. As for the four skills that make up the social construction of knowledge, they appear 12 times

in the first eight semesters, five of which are found in activities carried out in the first six semesters, and seven in semesters seven and eight. In total, of the 15 classroom/workshop activities analyzed in the 28 syllabi, 63 references were found in the first eight semesters, of which 63.5% are addressed in semesters seven and eight.

The fifth and sixth columns of results in Table 2 show research skills that are described as personal work. Concerning the group of conceptual construction skills, these are referenced 24 times in the first eight semesters, of which 18 references are found in semesters seven and eight. As for the five methodological construction skills, these are addressed on ten occasions, of which none are found within the first six semesters. The four skills for the social construction of knowledge are addressed six times, all within semesters seven and eight. In total, the research skills that are developed through personal work (outside of the classroom) are referenced 40 times throughout the eight semesters, finding only six in the first six semesters and the remaining 34 in semesters seven and eight.

The seventh and eighth columns of the results show the research skills that are addressed in assessments, whether summative or formative. The six conceptual construction skills are addressed 45 times in the first eight semesters, 16 of which are found in the first six semesters and 29 in semesters seven and eight. Methodological construction skills are addressed 15 times in the first eight semesters, all of which are found in the seventh and eighth semesters. The same phenomenon occurs with the four skills for the social construction of knowledge, where eight references can be found, all of them in semesters seven and eight.

Regarding the results by semester (chart 1), the first year of the career includes three disciplinary subjects, and the syllabi address two research skills belonging to the conceptual construction group. In year 2, three subjects designed and taught by the school of Nursing can be found, which contribute to three research skills related to conceptual construction and one belonging to social construction. Year 3 includes eight disciplinary subjects that address the six conceptual construction skills and one of the methodological construction skills. Although the four skills for social construction are addressed, this is found only in one of the eight subjects. Upon reaching the seventh semester, students begin writing their undergraduate dissertation, where they must develop thirteen out of fifteen research skills, all simultaneously in the course of one subject.

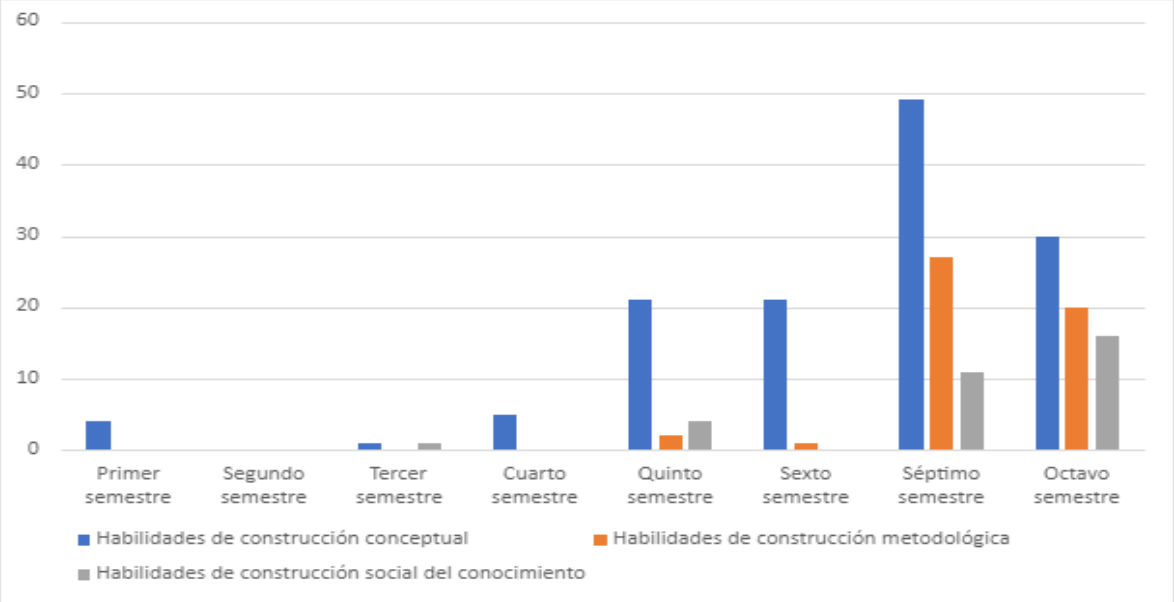
If all the learning outcomes, assessments, activities (lectures/workshops), and personal work that address these skills in the first six semesters are quantified, this gives a total of 60. When doing the same with the subjects taught during semester seven, a total of 87 references are obtained; if the subjects in the eighth semester are added, we obtain 156 references to research skills only in one year (seventh and eighth semesters), compared to the 60 that are found in the first three years of training. Another interesting result is the coherence between learning outcomes, activities, and assessments. Of all the subjects that were analyzed, the only one showing a coherent thread between these three aspects with regards to references to research skills is the subject Research Methodology and Undergraduate Dissertation.

Table 2: Number of syllabi that address research skills, distributed by learning outcomes, classroom-based activities, personal work activities, and assessments, N:28, Chile, 2022.

		Syllabi in which the Learning Outcomes address research skills in the first 8 semesters	Syllabi in which the Learning Outcomes address research skills in the first 6 semesters	Syllabi in which the classroom-based activities (lecture/workshops) incorporate research skills in the first 8 semesters	Syllabi in which the classroom-based activities (lecture/workshops) incorporate research skills in the first 6 semesters	Syllabi in which the personal work activities incorporate research skills in the first 8 semesters	Syllabi in which the personal work activities incorporate research skills in the first 6 semesters	Syllabi in which the assessments address research skills in the first 8 semesters	Syllabi in which the assessments address research skills in the first 6 semesters
Conceptual Construction Skills	Appropriating and reconstructing the ideas of others	3	1	4	1	7	2	7	2
	Generating ideas	5	3	8	5	3	0	7	1
	Logically organizing, exposing, and defending ideas	3	1	2	0	4	2	6	3
	Problematizing	10	6	16	8	5	1	14	6
	Unraveling and semantically elaborating (constructing) a study objective	3	1	5	2	2	0	6	2
	Performing a creative conceptual synthesis	2	0	2	0	3	1	5	2
Methodology Construction Skills	Establishing the research method	2	0	2	0	2	0	3	0
	Making the knowledge construction method relevant	2	0	2	0	2	0	3	0
	Constructing observable variables	3	1	5	2	2	0	3	0
	Designing procedures and instruments to search for, retrieve, and/or generate information	2	0	3	0	2	0	3	0
	Handle and/or design techniques for the organization, systematization, and analysis of information	2	0	2	0	2	0	3	0
Skills for Social Construction of Knowledge	Working in Groups	2	0	5	2	2	0	3	0
	Socializing the knowledge construction process	2	0	3	1	7	2	3	0
	Socializing knowledge	1	0	2	1	3	0	1	0
	Communicating	1	0	2	1	4	2	1	0

Source: Own elaboration based on Moreno's codification.[10]

Chart 1: Number of syllabi per semester that address research skills, distributed by construction hubs, N:28, Chile, 2022.



Source: Own elaboration.

DISCUSSION

The results exposed above make it possible to analyze whether the syllabi of the subjects found in the Nursing curriculum align with what is described by the career, faculty, and university, regarding the training of professionals required by our current society (professionals that are capable of transforming the realities in which they are inserted). To this end, research skills should be incorporated into all disciplines, subjects, and components of the curriculum, which entails a lengthy and complex process that would also allow students to gain additional positive tools such as communication skills, as well as critical and divergent thinking.[17-19]

The 15 research skills that were analyzed in this case study are addressed in their entirety during the first eight semesters of the curriculum. However, the way in which they are incorporated is not what is recommended methodologically by the consulted authors, who assert that including curricular activities aiming at research training in the last semesters deprioritizes research.[20-22]

Of all the references to research skills that were analyzed in the syllabi (216), 27% are addressed in the first six semesters of the Nursing curriculum that was explored. Some studies carried out on nursing students reveal weaknesses related to research skill training during the first years. This substantially improves after intervention using specific academic programs.[21,22]

Research skills should be incorporated across the curriculum of any discipline since this is what will produce professionals that are self-sufficient in searching for reliable knowledge. Moreover, these skills will be part of the expectations and requirements encountered by nurses in the labor market, be it clinical nurses or any other role they may undertake.[6] For this, a deeper notion of research skill development is needed in the discipline's curriculum and subjects; this is mentioned by those who consider as main weaknesses the lack of knowledge professors have of the research skills of their students, the lack of systematicity, and the complexity of orienting and executing teaching tasks.[23] Even studies that analyze research skills in the third year of the degree[23] rate the research methodology

syllabi as insufficient. Here, the tutors in charge of guiding undergraduate dissertations perceive their lack of time and experience in training students in research work as the main problems.[24-26]

One limitation of this study is that it only analyses the curriculum of one school of nursing. It is also limited in how deeply it evaluates how each research skill is addressed. This is because it only contemplates whether each area (learning outcome, classroom-based activity, workshops, personal work, and assessment) addresses these skills or not, but does not refer in depth to how each skill is addressed. Furthermore, it does not include skills that can be addressed by non-disciplinary subjects, that is, general training subjects such as those designed and executed by the departments of science, mathematics, and morphology, among others.

CONCLUSIONS

This study highlights the importance of incorporating research skills into nursing students' training so that they become professionals capable of transforming the reality in which they are inserted. However, the results show that there are still weaknesses in the way these skills are included in the nursing curriculum. Therefore, it is necessary to carry out an in-depth and systematic review of the development of research skills in nursing training, and that specific interventions be carried out to improve the training in this field. Furthermore, these skills should be incorporated across the curriculum of any discipline, in order to train professionals who can autonomously seek knowledge. Future studies should focus on the depth of how each skill is addressed, as well as on the inclusion of research skills in non-disciplinary subjects.

It is crucial to carry out similar curricular analyses in any field, that explore how research skills are addressed and to what extent they are transmitted in professional training. These matrix analyses make it possible to quantify and analyze whether research skills are taught consistently and proportionally to academic development, not only to encourage professionals to do research, but also to instill in them the need and ability to be prepared to face any difficulty or problem that arises in their discipline, work, and society.

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