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ORIGINAL

Didactic capacity of the teacher in the achievement of clinical competencies in resident physicians in Lima

Capacidad didáctica del docente en el logro de competencias clínicas en médicos residentes en Lima

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ABSTRACT

Introduction: resident physicians daily demonstrate their clinical competencies in the performance of their duties in a hospital; however, the level of these can depend on many factors included in your training process.
Objective: to determine the didactic capacity of the teacher in the achievement of clinical competencies in resident physicians of a hospital in Lima, 2022.
Methods: the approach was quantitative, of a basic type, non-experimental design, causal correlation and cross section. The census population consisted of 102 resident physicians. Two questionnaires were used: one on the teaching capacity of the teacher and the other on clinical competencies in resident physicians. Descriptive statistics were used and, to verify the hypotheses, the Pseudo R squared test was used.
Results: a Nagerkerke coefficient of 28,5 % was evidenced, which indicates the dependency of the achievement of clinical competencies with the teaching capacity of the teacher in resident physicians.
Conclusion: it is concluded that there is an incidence of 28,5 % between the teaching capacity of the teacher in the achievement of clinical competencies in resident doctors with a level of direct correlation p<0,05.

Keywords: Teaching Didactics; Clinical Competencies; Medical Residents.

RESUMEN

Introducción: los médicos residentes demuestran diariamente sus competencias clínicas en el desempeño de sus funciones en un hospital; sin embargo, el nivel de éstas puede depender de muchos factores incluidos en su proceso de formación.
Objetivo: determinar la capacidad didáctica del docente en el logro de competencias clínicas en médicos residentes de un hospital de Lima, 2022.
Métodos: el enfoque fue cuantitativo, de tipo básico, diseño no experimental, correlación causal y corte transversal. La población censal estuvo constituida por 102 médicos residentes. Se utilizaron dos cuestionarios: uno sobre la capacidad docente del profesor y otro sobre competencias clínicas en médicos residentes. Se utilizó estadística descriptiva y, para verificar las hipótesis, el test de Pseudo R al cuadrado.
Resultados: se evidenció un coeficiente de Nagerkerke de 28,5 %, lo que indica la dependencia del logro de competencias clínicas con la capacidad docente del profesor en médicos residentes.
Conclusiones: se concluye que existe una incidencia del 28,5 % entre la capacidad docente del profesor en el logro de competencias clínicas en médicos residentes con un nivel de correlación directa p<0,05.

Palabras clave: Didáctica Docente; Competencias Clínicas; Médicos Residentes.

INTRODUCTION

As a result of the pandemic, the health sector had to face a major reorganization in order to meet the needs of patients.[1] In that sense, resident physicians were required to join the care teams, paralyzing their rotations at their corresponding sites. This caused their training process to be interrupted. Taking these aspects into account, it is important to evaluate the reality of the quality of education and care of the population in the healthcare area.[2]

One of the pillars of educational quality is the work of teachers. It is the teachers who adapt to the new ways of executing the teaching-learning process.[3] In addition to helping to build knowledge, they are in charge of guiding students in making decisions and achieving competencies. [4]

In accordance with the context of the health sector, it is important that the training entities focus their attention on the competencies that result from clinical practice.[5] In this sense, the physician assistant assumes the role of teaching tutor for resident physicians. He/she should prioritize learning and technical support for them.[6]

In Peru, the development of clinical competencies in resident physicians has become a fundamental aspect because it allows for effective action in a real context.[7] The tutor's guidance will ensure that residents focus on developing aspects related to patient care by putting into practice their clinical judgment and decision-making skills.[8]

Resident physicians at a level III hospital in Lima are involved in a continuous learning process, performing in a caring and administrative manner. They develop different activities under the supervision of attending physicians in order to meet institutional goals. In view of the above, the following question was asked: what is the incidence of the didactic capacity of the teacher in the achievement of clinical competencies in the resident physicians of a hospital in Lima, 2022? Therefore, we sought to determine this incidence.

In the international framework, research was found to prove that critical thinking skills such as argumentation, analysis, problem solving and evaluation were achieved in individuals thanks to alternative didactics.[9] Thus, it was concluded that the person who possesses critical thinking can solve everyday problems related to the area of training. It was demonstrated that simulation in training represents a significant advance in neurological clinical competence that improves performance.[10] It was also shown that students recognized teaching as a learned skill. Also, a good level of competency in facilitation skills was achieved.[11]

At the national level, a study demonstrated that an adequate didactic teaching aptitude is associated with a good attitude towards the subject of mathematics and vice versa.[12] A direct and significant relationship was found between didactic competence and the progress of communication skills in students.[13] On the other hand, a direct relationship was established between the didactic capacity of the teacher and the attainment of competencies in nursing interns.[14] Finally, students obtain a better average if they present a higher level of clinical competencies during the development of their internship in the hospital, with the help of their teacher.[15]

Currently, education has adopted the cognoscitivist approach that includes methods, materials, procedures and the interaction of the actors. Also, the creativity and initiative of the student to elaborate their own notions through meaningful learning is considered. As an added factor, networking and the use of new communication and information techniques are valued.[16] For an effective outcome, the above aspects were evaluated according to the context. As part of the training, there must be a notion of knowing how to act and understanding when knowledge and procedures are useful.[17]

Regarding didactics, the theologian and pedagogue John Amos is recognized as the father of didactics. His work The Magna Didactica Magna identified the need for research on teaching methods for the attainment of perfection. As a result, he determined the three principles for the scope of didactic development: didactics manifests itself in skill and art; teaching is aimed at learning with the collaboration of all; and the teaching and learning process is characterized by speed and efficiency.[18] Didactics is an interdisciplinary science of the systematic teaching process. Its objective is to give first place to students' learning, to study and support the activity of teaching as a consequence of the knowledge of the various educational processes.[19]

In higher education institutions, it is essential to have their own didactics that generates the edification of learning, including notions, previous experiences, motivation and perspectives that respond to their personal and professional project. Therefore, didactic strategies should be developed according to the needs of the students.[20]

Along the same lines, didactic teaching skills include guiding and directing the teaching process. The teacher plays the role of mediator to motivate students to put into practice what they have learned thanks to methodological strategies.[21] Working with didactic skills means that teachers can provide quality teaching and

improve the training process. For the Ministry of Education, the didactic capacity of teachers has the following dimensions: creation of an adequate climate for learning; conducting the teaching process with mastery of disciplinary content; use of different didactic resources.[22]

It is essential that the teacher-student binomial be proactive so that mistakes are recognized as opportunities for collaborative learning; in this way, the proposed goals are achieved. In addition to this, the work of competency-based learning seeks to relate the appropriate strategies with the ideal resources for their performance.[22]

As part of the context of this research, the clinic is defined as the practical part of the medical career that integrates knowledge and its management to solve the problems that affect the health of patients. It also includes skills and attitudes during patient care. Therefore, clinical practices are different from what can be worked on in a classroom, since students demonstrate their ability to face real conflicts.[23]

Competencies are classified according to the criterion of performance in three groupings: basic competencies, acquired during the initial stage of our experience, which provide general knowledge used in daily activities; generic competencies, linked to the aptitudes of professionals within work teams, considering the ease of planning and management; specific competencies that involve specialized knowledge, skills and attitudes according to the individual's field of work.[24]

Referring to the clinical competence variable, it includes the characteristics of health professionals, promoting the training of all of them and respecting the functions and fields of action applied at the undergraduate and graduate levels.[25]

Clinical competence takes into account communication and organizational skills, abilities and skills for teamwork that allow for efficient solutions to the problems of the sector. It also includes the following attributes: clinical skills, which are understood as the ability to obtain all the information during the interrogation for the preparation of the clinical history and when performing the physical examination of patients to interpret the information acquired; knowledge and understanding, by remembering the important knowledge around the clinical circumstances that lead to provide timely, concrete and effective medical care; interpersonal attributes, which are the professional and personal aspects of the physician; problem solving and clinical judgment, where knowledge, skills and interpersonal characteristics are used for the diagnosis and management of pathologies; technical skills, the ability to perform procedures with approved techniques in the care of patients.[26]

In postgraduate specialty studies in medicine, problem-based learning is useful because the patient is prioritized and the physician tests his or her knowledge and attitudes to face health problems and solve them satisfactorily.[27]

The dimensions of the clinical competencies are the following: knowledge, which refers to the acquisition and feedback of the knowledge base in theories and permanent updating to comply with the established protocols; skills, corresponding to the execution of invasive and non-invasive therapeutic procedures for the diagnosis and treatment of the patient; attitudes, understood as the set of qualities evidenced in patient care, assertive communication, ethical commitment and values necessary for the exercise of the work with quality. The objective of the research was determine the didactic capacity of the teacher in the achievement of clinical competencies in resident physicians of a hospital in Lima, 2022.

METHODS

The study presented a non-experimental design, since there was no manipulation of the variables; transversal, because of the measurement of the variables in a determined time and space. It is also called causal because it seeks the relationship between the two variables.[28]

This research was of a basic type in order to increase the body of knowledge on the teaching and medical scenario. Therefore, the vision was focused on the didactic capacity of the teacher in the achievement of clinical competencies in resident physicians of a level III hospital in Lima.[29]

The way in which the delimitation of a theoretical variable into measurable and verifiable dimensions by means of a measuring instrument was maintained. Consequently, it describes the variables of didactic capacity and clinical competencies.[28]

The population was constituted by the total set of elements that show similar characteristics around what is to be studied. It was also necessary to consider that time and place are transcendental components in the conceptualization of a population.[28]

Based on this definition, the population of this research was made up of 102 resident physicians doing their internships for their specialty, based in a level III hospital in Lima in the year 2022. Resident physicians performing their internships, who gave their consent to carry out the survey, have been taken into account.

Data collection techniques and instruments

For this research study, the survey technique was used, the participants responded to two questionnaires that collected the data focusing on the visualization of the object of study, taking into account that reality has

not been altered. The instrument was the questionnaire with Likert-type scale, because it is better adapted to the technique proposed. The instrument was submitted to the judgment of three experts to meet the criteria of clear language, easy comprehension and relevance. The items met the criteria of relevance in terms of quantity and quality.

To obtain the reliability of the instrument, a pilot test was used, which consisted of applying the instrument to a group of individuals with characteristics similar to those of the study population. The statistical test used was Cronbach's alpha.

Table 1. Level of reliability of the didactic capacity and clinical competencies

Variables	N° of times	Cronbach's alfa
Didactic capacity	24	0,967
Clinical competencies	15	0,959

The reliability coefficients of the instruments were appreciated, the one of didactic capacity, with 24 items, showed 0,967 and the one of clinical competences, with 0,959 with 15 questions, which indicated that its application is reliable. Descriptive analysis and statistics were also used, which allowed analyzing the results to show the results in an orderly manner, in ranges and levels for each of the variables and dimensions.

RESULTS

Table 2. Frequency table: levels of didactic capacity in resident physicians of a hospital in Lima, 2022

		Didactic capacity of the teacher			
		Frequency	Percentage	Valid Percentage	Accumulated percentage
Valid	Low	12	11,8	11,8	11,8
	Medium	72	70,6	70,6	82,4
	High	18	17,6	17,6	100,0
	Total	102	100,0	100,0	

Note: Performed by the researcher using SPSS.

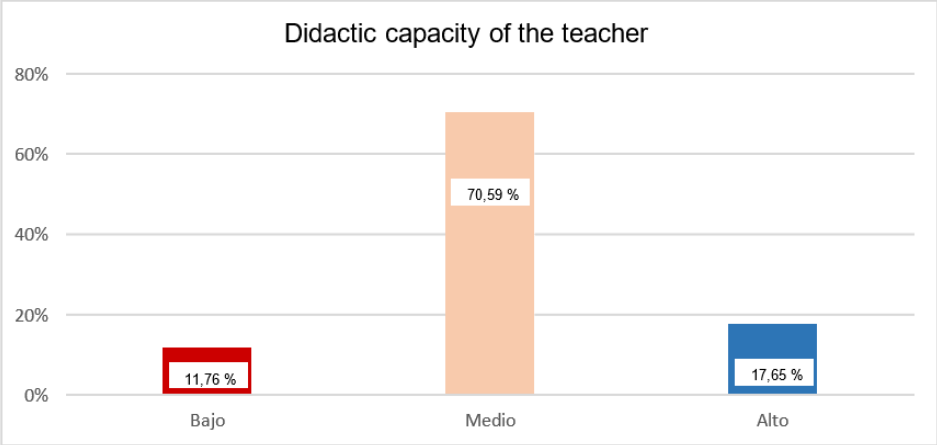

Figure 1. Levels of the didactic capacity of the teacher in resident physicians of a Lima Hospital, 2022

In table 2 and figure 1, the levels of didactic capacity of the teacher of a hospital in Lima were presented, of which 11,76 % of the resident physicians stated that the level was low, while 70,59 % indicated a medium level and 17,65 % indicated a high level.

Table 3. Frequency table: levels of the dimensions of the didactic capacity of the teaching staff of the resident physicians of a hospital in Lima, 2022

Levels	Creation of a climate conducive to learning		Conducts the teaching process		Uses a variety of didactic resources	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Low	11	10,8	16	15,7	16	15,7
Medium	62	60,8	67	65,7	66	64,7

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High	29	28,4	19	18,6	20	19,6
Total	102	100,0	102	100,0	102	100,0

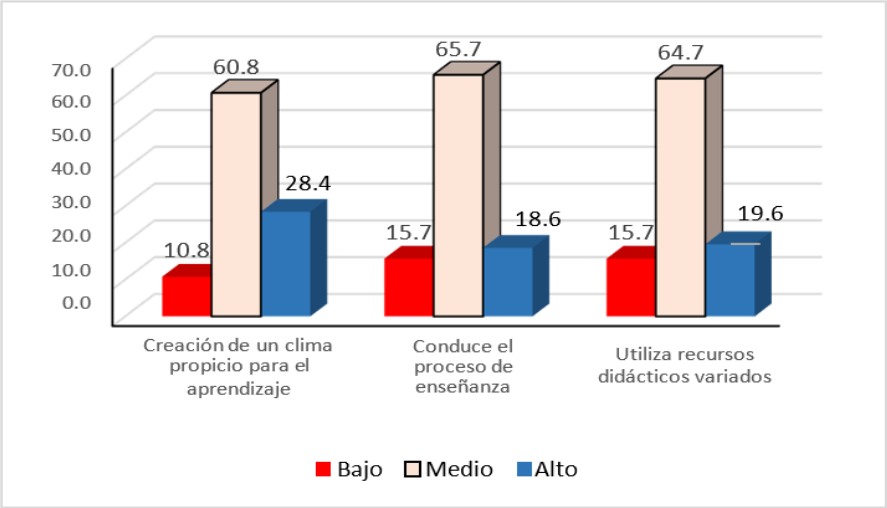

Figure 2. Levels of the dimensions of the didactic capacity of the teacher in resident physicians of a hospital in Lima, 2022

Table 3 and figure 2 showed the levels of the dimension of the didactic capacity of the teaching staff of the resident physicians of a hospital in Lima. In the dimension creating a climate conducive to learning, 10,8 % perceived that the level was low; while 60,8 %, a medium level and 28,4 %, a high level. On the dimension conducts the teaching process, 15,7 % perceived that the level was low; while 65,7 %, a medium level and 18,6 %, a high level. On the dimension uses varied didactic resources, 15,7 % perceived the level to be low; while 64,7 %, a medium level and 19,6 %, a high level.

Table 4. Frequency table: levels of achievement of clinical competencias in resident physicians of a hospital in Lima, 2022

		Clinical competencias			
		Frequency	Percentage	Valid Percentage	Accumulated Percentage
Valid	Low	10	9,8	9,8	9,8
	Medium	65	63,7	63,7	73,5
	High	27	26,5	26,5	100,0
	Total	102	100,0	100,0	

Note: Performed by the researcher using SPSS

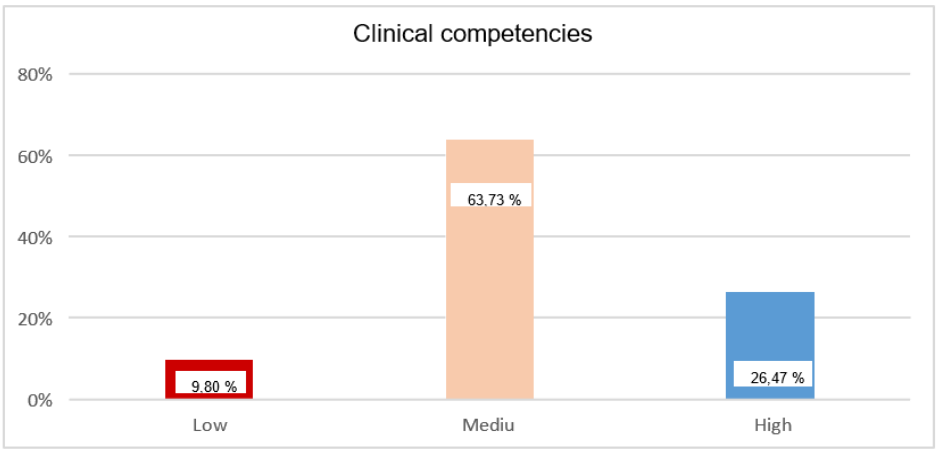

Figure 3. Levels of achievement of clinical competencies in resident physicians of a hospital in Lima, 2022.

Table 5 and figure 3 indicated the levels of clinical competencies, showing that 9,8 % were at a low level, while 63,73 % were at a medium level and 26,47 % were at a high level in terms of clinical competencies in the

resident physicians of a Lima hospital.

Knowledge Skills Attitudes

Table 5. Frequency table: levels of the dimensions of the achievement of clinical competencies in resident physicians of a hospital in Lima, 2022

Levels						
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Low	8	7,8	20	19,6	10	9,8
Medium	68	66,7	57	55,9	58	56,9
High	26	25,5	25	24,5	34	33,3
Total	102	100,0	102	100,0	102	100,0

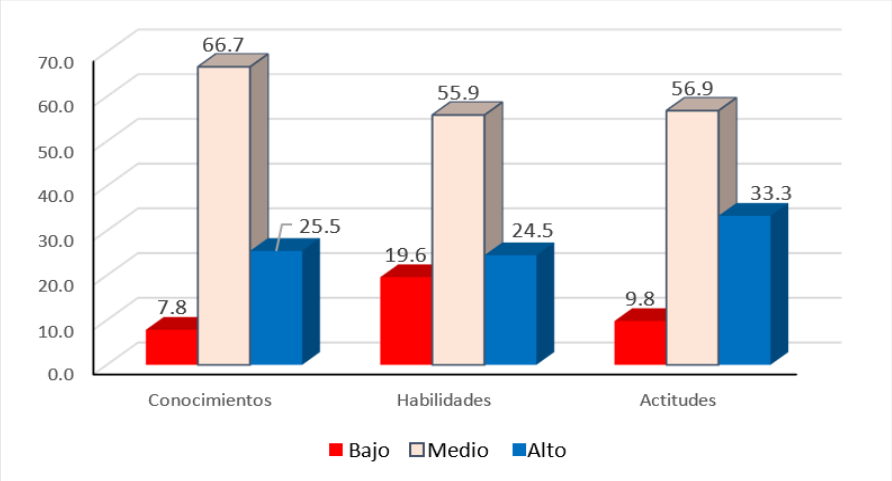

Figure 4. Levels of the dimensions of clinical competency achievement in resident physicians of a hospital in Lima, 2022

Table 5 and figure 4 showed the levels of the clinical competencies dimension. In the knowledge dimension, 7,8 % were found to be at a low level, while 66,7 % were at a medium level and 25,5 % at a high level. In the skills dimension, 19,6 % were at a low level, while 55,9 % were at a medium level and 24,5 % at a high level. In the attitudes dimension, 9,8 % were found at a low level, 56,9 % at a medium level and 33,3 % at a high level of clinical competencies.

Model adjustment test

Tabla 6. Model adjustment iformation

Model adjustment information					
	Model	Logarithm of the likelihood -2	Chi-square	gl	Sig.
Didactic capacity of the teacher in the achievement of clinical competences	Intersection only	48,384			
	Final	21,098	27,286	2	0,000
Didactic capacity of the teacher in the knowledge of physicians	Intersection only	47,444			
	Final	21,285	26,158	2	0,000
Didactic ability of the teacher in the skills of physicians	Intersection only	54,228			
	Final	17,811	36,417	2	0,000
Didactic capacity of the teacher on physicians' attitudes	Intersection only	40,853			
	Final	17,948	22,906	2	0,000
Linking function: Logit.					

Table 6 shows the adjustments for the model of the didactic capacity of the teacher in the achievement of clinical competencies in resident physicians. The Chi-square statistic 27,286 and p.value<0,05 (0,00<0,05) were obtained. This indicated that the variables are associated and present dependence. Also, we have the didactic capacity of the teacher on the knowledge of the physicians with a Chi-square test of independence of 26,158 and p.value<0,05 (0,00<0,05). Similarly, the didactic ability of the teacher in the doctors' skills with Chi-square

statistic of 36,417 with a p.value<0,05 (0,00<0,05), didactic ability of the teacher in the doctors' attitudes with a Chi-square of 22,906 and a p.value<0,05 (0,00<0,05).

Goodness adjustment test of the models

Table 7. Goodness-of-fit test between the study variables

Goodness test				
Variable y dimensions		Chi- cuadrado	gl	Sig.
Didactic capacity of the teacher in the achievement of clinical competencies.	Pearson	7,053	2	0,029
	Desvianza	3,940	2	0,139
Didactic capacity of the teacher in the knowledge of physicians	Pearson	9,322	2	0,009
	Desvianza	4,509	2	0,105
Didactic capacity of the teacher in the physicians' skills	Pearson	2,283	2	0,319
	Desvianza	1,796	2	0,407
Didactic ability of the teacher in the attitudes of physicians	Pearson	1,707	2	0,426
	Desvianza	1,740	2	0,419
Linking function: Logit				

In table 7, it was observed that there is p. value > 0,05, which indicated that the didactic ability of the teacher is linked to the achievement of clinical competencies, allowing the model to be detected for its coefficient representation.

Parameter estimates

Table 8. Parameter estimates of the variable and its dimensions

		95% confidence interval						
		Estimation	Desv. Error	Wald	Gl	Sig.	Lower limit	Upper limit
Achievement of Clinical Competencies	(Low)	-4,803	0,697	47,496	1	0,000	-6,169	-3,437
	(Medio)	-0,887	0,518	6,936	1	0,007	-1,902	0,128
Didactic capacity	(Low)	-4,328	0,889	23,694	1	0,000	-6,071	-2,585
	(Medium)	-2,290	0,593	14,887	1	0,000	-3,453	-1,127
Knowledge of Physicians	(Low)	-5,102	0,724	49,688	1	0,000	-6,520	-3,683
	(Medium)	-0,884	0,518	2,917	1	0,088	-1,899	0,130
Didactic capacity	(Low)	-4,241	0,919	21,290	1	0,000	-6,043	-2,440
	(Medium)	-2,375	0,598	15,794	1	0,000	-3,546	-1,204
Physician skills	(Low)	-4,135	0,641	41,588	1	0,000	-5,392	-2,878
	(Medium)	-0,898	0,518	5,002	1	0,023	-1,914	0,118
Didactic capacity	(Low)	-4,857	0,882	30,287	1	0,000	-6,586	-3,127
	(Medium)	-2,467	0,600	16,903	1	0,000	-3,642	-1,291
Physicians' attitudes	(Low)	-4,585	0,694	43,711	1	0,000	-5,944	-3,226
	(Medium)	-1,266	0,568	4,962	1	0,026	-2,380	-0,152
Didactic capacity	(Low)	-3,595	0,872	16,995	1	0,000	-5,305	-1,886
	(Medium)	-2,319	0,626	13,716	1	0,000	-3,546	-1,092

Link function: Logit

a. This parameter is set to zero because it is redundant.

In table 8, it was evident that the results of parameter estimation of teacher didactic ability in the achievement of clinical competencies in resident physicians show dependence, since the Wald coefficient > 4,000. The level of statistical significance was p.value < 0,05. This indicated that respondents who present medium level in terms of didactic ability are certain to demonstrate medium level in clinical competencies. In such sense, regarding the didactic ability of the teacher and the knowledge dimension of the physicians, Wald coefficients >0,05 and a p.value<0,05 are shown. This same comparison is shown for the didactic ability of the teacher and the doctors' skills with Wald coefficients >0,05 shows representativeness p.value<0,05. Finally,

teacher didactic ability and physician attitudes dimension showed Wald coefficients >0,05 and p.value<0,05. This indicates the dependence of the dimensions toward the study variables.

Pseudo R-squared test

Table 9. Pseudo R-squared test of the variables in reference

Variables y dimensions	Cox y Snell	Nagelkerke	McFadden
Teacher didactic capacity in the achievement of clinical competences.	0,235	0,285	0,154
Didactic ability of the teacher in the knowledge of physicians.	0,226	0,281	0,157
Didactic ability of the teacher and the skills of physicians.	0,300	0,348	0,180
Didactic capacity of the teacher and the attitudes of the physicians.	0,201	0,240	0,123
Linking function: Logit			

The table 9 showed the statistics of the Pseudo R-squared test, to analyze the degree of variability of the three statistics, for the effect the Nagelkerke coefficient will be assumed which shows the most stable values for all cases.

DISCUSSION

According to the results presented, it was inferred that a greater didactic capacity of the teacher leads to a greater achievement of clinical competencies in resident physicians to achieve an efficient performance that benefits patients in the care process. This is similar to the findings of García[14] (2021), who demonstrated a direct relationship between the aforementioned variables. These data show that teaching is good in theory and practice. It should also be taken into account that teachers should intervene effectively in the training process of health professionals.

The variable didactic capacity of the teacher presents low, medium and high levels in 11,76 %, 70,59 % and 17,65 %, respectively. This meant that the training of a medical professional is a complicated task. This coincided with the results of Vasquez[13] (2018), who argues the development of didactic competence of the teaching staff is an indispensable element for student learning. Likewise, Espinoza et al.[6] (2013) presented the way teachers teach, concluding that some are more effective because they promote problem solving and motivate the student.

The variable achievement of clinical competencies in resident physicians evidences in its descriptive statistics a low level of 9,8 %, medium 63,73 % and high 26,47 %. This means that the great majority present a medium level of knowledge, skills and attitudes. According to what has been analyzed, this is similar to Veliz[15] (2019), who stated that the higher the level of clinical competencies of the student in the hospital internship, the higher the average.

CONCLUSIONS

The research allows concluding that there is an incidence of 28,5 % between the didactic capacity of the teacher in the achievement of clinical competencies in resident physicians with a direct correlation level p<0,05. Also, it is proved that there is an incidence of 28,1 % of the didactic capacity of the teacher in the knowledge of resident physicians, with a direct correlation level p<0,05. In addition, there is an incidence of 34,8 % of the didactic capacity of the teacher on the skills of the resident physicians with a direct correlation level p<0,05. Finally, there is an incidence of 24 % of the didactic capacity of the teacher on the attitudes of the resident physicians with a direct correlation level p<0,05.

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COMPETING INTERESTS

The authors declare not to have any kind of conflict of interest in any of the stages of execution of the research. Authors' contributions.

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