



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

*International Journal of Recent Scientific Research*  
Vol. 11, Issue, 01(E), pp. 37037-37040, January, 2020

**International Journal of  
Recent Scientific  
Research**

DOI: 10.24327/IJRSR

## RESEARCH ARTICLE

# EFFECT OF A MEDICINE TRAINING PROGRAM ON CLINICAL COMPETENCES ON THE IDENTIFICATION AND MANAGEMENT IN THE SYSTEMIC ARTERIAL HYPERTENSION

**Carlos E. Cabrera-Pivaral<sup>1</sup>, Jennifer Aylin Espinoza-González<sup>4</sup>,  
David López de la Mora<sup>2</sup>, Guillermo Gaona-Bojorquez<sup>3</sup>,  
Diane Core Romero-Lozano<sup>5</sup>, and Víctor Horacio Orozco-Covarrubias<sup>5</sup>**

<sup>1</sup>Profesor Investigador, Universidad de Guadalajara, LAMAR; CUCS, Universidad de Guadalajara

<sup>2</sup>Profesor Investigador, Universidad de Guadalajara, Universidad de Guadalajara LAMAR

<sup>3</sup>Coordinador de Pasantes en Medicina, Universidad Guadalajara LAMAR

<sup>4</sup>Alumnos del Verano de Investigación, Escuela de Medicina LAMAR, Guadalajara, Jalisco

<sup>5</sup>Doctorado en ciencias de la salud pública, Universidad de Guadalajara

DOI: <http://dx.doi.org/10.24327/ijrsr.2020.1101.5045>

## ARTICLE INFO

### Article History:

Received 6<sup>th</sup> October, 2019

Received in revised form 15<sup>th</sup>

November, 2019

Accepted 12<sup>th</sup> December, 2019

Published online 28<sup>th</sup> January, 2020

### Key Words:

Systemic arterial hypertension,  
professional skills, interns, students.

## ABSTRACT

**Objective:** To assess the effect of a medical training program on clinical competencies on the identification and management in the SAH.

**Experimental section:** Quasi-experimental study. Place: Guadalajara LAMAR University, Campus Vallarta. Temporary: January-May 2019. Universe: upper secondary school students in a high school and higher education students in a BA of medicine; 155 participants Sample: 22 students without health training (G0), 18 second semester students (G1), 31 fourth semester students (G2) 84 interns (G3) and 42 family medicine grade (G4). Analysis: KW, Non-parametric statistics ( $p \leq 0.05$ ).

**Results:** Professional competences for the identification and management of HAS: **G0** with 90.9% novice. **G1** with 33.3% competent. **G2** with 54.83% competent, 35.71% professional and 7.15% expert. **G3** with 52.38% competent, and 35.71% professional and 7.15% expert. **G4** with 33.33% professional and 45.23 expert.. (KW,  $p \leq 0.05$  in all cases).

**Conclusions:** The evaluated curriculum shows a linear growth on the development of professional skills on management and identification of HAS, however, it is likely to improve.

**Copyright © Carlos E. Cabrera-Pivaral et al, 2020**, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

## INTRODUCTION

The blood pressure (BP) is classified as normal when it is in a range of systolic <120 and diastolic 80mmHg, on the other hand, arterial hypertension is classified in three ways according to the range in which it is found; high (120-129 and <80 mmHg), grade 1 (130-139 and 80-89 mmHg) and grade 2 ( $\geq 140$  or  $\geq 90$  mmHg), so a correct diagnosis is of vital importance considering the risk factors that HAS brings with her. (Gijón, T. et al. 2018). In Mexico, the systemic arterial hypertension is a significant public health problem because in the Boletín Epidemiológico: Sistema Nacional de Vigilancia Epidemiológica, el Sistema de Información Única del SINAVE de 2018 (Sistema Nacional de Vigilancia Epidemiológica) reports 28,365 male cases and 79,108 female cases; a total of 106,454 cases nationwide, while in Jalisco 1,956 male cases and 5,510 female cases are reported; being a total of 8,503

cases. According to the Encuesta Nacional de Salud y Nutrición de Medio Camino 2016 (ENSANUT, 2016), in Mexico 1 in every 4 adults suffers from systemic arterial hypertension being 25.5% of the population. Similarly, ENSANUT 2016 reports that there is a slight increase in women (26.1%) than in men (24.9%). The Systemic Arterial Hypertension should also be considered a social problem due to the patients' self-perception about their health once they know their diagnosis, because sometimes the lack of information makes them think that their health is not good if they suffer from a degenerative chronic disease; so it is important to explain to the patient his condition according to his sociocultural level. Another notable aspect of Systemic Arterial Hypertension is the economic impact that it has on health institutions, the treatments must be constant, as well as the performance of various tests that allow monitoring of the patient's condition.

\*Corresponding author: **Carlos E. Cabrera-Pivaral**

Profesor Investigador, Universidad de Guadalajara, LAMAR; CUCS, Universidad de Guadalajara

Based on the foregoing, we recognize the urgency that is to adequate the training of human resources in the identification and management of the systemic arterial hypertension, therefore in this study we will explore how a medical curriculum has an effect on the development of clinical competences in interns from Guadalajara LAMAR University; recognizing and defining the level in which they achieve to be competent interns. It would be at one of the levels established by Dreyfus and Dreyfus in 1980 and Carracio and Col. In 2008 with its restructuring skill development levels, specifically in health personnel.

### Experimental Section

A quasi-experimental study of a pre-experimental type was conducted (Campbell & Stanley, 1966; Hernández Sampieri, 2010) in which 3 groups were compared with a static group; this was done with the objective of analyzing the effect of the curriculum of the Bachelor in Medicine in the Vallarta Campus of the Guadalajara LAMAR University, during the 2019A school year. The universe consisted of 155 individuals from which 22 are high school students from an institution of upper secondary education, 18 are second-semester medical students, 31 are fourth-semester medical students, 84 are enrolled medical interns and 42 the family medicine grade (Guadalajara LAMAR University 2019A), the instrument was applied to measure professional competences for the identification and management of systemic arterial hypertension.

Following the methodology of the pre-experimental design (Campbell, J & Stanley, J. 1966), the intervention considered the curriculum of the BA in medicine whose effect was analyzed according to the level of professional skills of students and interns, by the students studied to this, they were considered as chronologically related intervention groups, so that individuals that are not enrolled in the institution were designated as a control group or Group 0 (G0) since they did not study a BA of the area, people that are not enrolled in the University did not receive the intervention at any time; meanwhile, the students of the second semester were called Group 1 and received the intervention during the "A" moment, the students of the fourth semester were designated as Group 2 (G2) and received the intervention at the time "B", finally the interns were named as Group 3 (G3) and received the intervention at the time "C", the three groups were compared to each other, as well as with the Group 0. In addition, G4 with family medicine grade.

The inclusion criteria of Group 0 was to include students of high school of any age and sex, who did not have health training; therefore, those interviewed subjects who have a minimum training in health were excluded from the study. On the other hand, in Groups 1 and 2 students of any age and sex enrolled in the University were included, regardless of their status as regular or irregular students, while their enrollment was valid at the time the evaluation was made, and they assisted in the designated place on the date and time indicated for evaluation; the same process was done with group 3 and 4, but only interns were included and family medicine. For those who did not attend the appointment, they would not have the opportunity to be evaluated later on, so they will be eliminated from the study. Then again, given the characteristics of the chosen study design (Campbell and Stanley, 1966), no elimination criteria was defined.

Information of age and sex of the participants was collected, to define the characteristics of the sample, and their professional competences were measured according to the identification and management of the Systemic Arterial Hypertension. These competences were evaluated by means of an instrument in Spanish to evaluate the competences in the identification and management of the Systemic Arterial Hypertension made by the co-authors of the paper; they were used with answers in a three-level ascending ordinal scale format. Likert frequency, with an individual score of 1 (corresponding to "False / Never") to 3 (corresponding to "True") per question, whose sum results in a total score of 0 to 100 points that allowed to classify the subjects of evaluation in one of 5 levels of competence according to the model set out by Dreyfus and Dreyfus in 1980:  $\leq 20$  points "Novice", 21 to 40 points "Beginner", 41 to 60 points "Competent", 61 to 80 points "Professional" and finally,  $\geq 81$  points "Expert". This fraction of the instrument has a Kuder-Richardson reliability index of 0.91 (Moreno, A. *et al.* 2016).

As it was mentioned earlier, the curriculum of the BA in Medicine of University was designed as the intervention to which Group 1, Group 2, Group 3 and group 4 were subduced; this consists of 65 subjects that cover 419 credits distributed in 8 school cycles (semesters) with a total of 4,326 hours of classes (Universidad Guadalajara LAMAR 2017B) and the intervention group 4 that cover 40 credits distributed in 6 school cycles (semesters) with a total of 1,326 hours of classes for family medicine.

The instrument for the evaluation of professional competences for the identification and management of the Systemic Arterial Hypertension was applied at the end of the 2019A school year; they were collectively cited for an anonymous evaluation that lasted about 50 minutes.

The obtained data was analyzed using descriptive statistics; the reagents in the test were compared with each other with non-parametric inferential tests with 95% confidence ( $p \leq 0.05$ ), using Kruskal-Wallis (KW) for medians, and Chi squared ( $\chi^2$ ) for proportions.

According to the prescriptions of the current national legislation, the study was classified as a "risk-free investigation" for the participants (Reglamento de la Ley General de Salud en Investigación en Salud, 1982), since documentary research methods and techniques were used, and no intentional intervention was carried out in the biological, psychological or social variables of the participants, therefore it was approved by the Ethics and Research Committee of the Guadalajara LAMAR University, which granted the institutional registry Number 2018-03-02.

## RESULTS

In Table 1, we observe that the universe composed of 197 subjects, 22 high school students, and 18 students of second semester of medicine, 31 students of fourth semester of medicine, 84 interns of medicine and 42 for family medicine grade. (Universidad Guadalajara, LAMAR 2019A). In G0 the 22 students are between 15 to 19 years old, and in G1, G2, G3 and G4 the proportion of 20 to 34 years is greater. Regarding sex they were mostly women, however, it was not significant ( $p > 0.05$ ) Table 1.

**Table 1** Demographic Characteristics

Demographic Characteristics	G0 (n=22)	G1 (n=18)	G2 (n=31)	G3 (n=84)	G4 (n=42)	p*
Age						
15-19	22 (100%)	8 (44,44%)	0 (0%)	0 (0%)	0 (0%)	
20-24	0 (0%)	10 (55,56%)	31 (100%)	68 (80,95%)	0 (0%)	<0
25-29	0 (0%)	0 (0%)	0 (0%)	15 (17,85%)	27 (64,28%)	,05
30-34	0 (0%)	0 (0%)	0 (0%)	1 (1,2%)	15 (35,72%)	
Sex						
Female	15 (68,18%)	7 (38,88%)	18 (58,06%)	43 (51,20)	19 (45,24%)	<0
Male	7 (31,82%)	11 (61,12%)	13 (41,94%)	41 (48,80%)	23 (54,76%)	,05

Source: Self-elaborated.

Table 2 shows the successes of the groups in the instrument for measuring the professional competences respecting the identification and management of the Systemic Arterial Hypertension; there is an increase in the successes improved by each group from G0 to G4. G0 (32, 72%), G1 (58, 88%), G2 (69, 03%), G3 (69, 04%), G4 (84%).

**Table 2** Successes of the groups in the instrument for measuring the professional competences respect to the identification and management.

Successes	G0 (n=22)	G1 (n=18)	G2 (n=31)	G3 (n=84)	G4 (N= 42)
Yes	26 (22,72%)	53 (58,88%)	107 (69,03%)	290 (69,04%)	176(84%)
No	84 (77,28%)	37 (41,12%)	48 (30,97%)	130 (30,96%)	34(22%)
<b>TOTAL</b>	110	90	155	420	210

Source: Self-elaborated.

Table 3 shows the level of the professional competence in the identification and management of the Systemic Arterial Hypertension (Dreyfus & Dreyfus, 1980) for each group, in which G0 shows 100% of non-competent, in G1 33,3% are competent, in G2 96,78% are competent, while in G3 95,24% are competent, and in G4 100% with competence; however the level of "Professional" is recognized and "Expert" is higher in G3 with 42,86% compared to the same level in the other groups.

**Table 3** Level of the professional competence in the identification and management of the Systemic Arterial Hypertension.

Level	G0 (n=22)	G1 (n=18)	G2 (n=31)	G3 (n=84)	G4 (n=42)
Novice (≤20)	20 (90,90%)	2 (11,1%)	0 (0%)	0 (0%)	0 (0%)
Beginner (21-40)	2 (9,09%)	10 (55,56%)	1 (3,22%)	4 (4,76%)	0 (0%)
Competent (41-60)	0 (0%)	6 (33,3%)	17 (54,83%)	44 (52,38)	9 (21,42%)
Professional (61-80)	0 (0%)	0 (0%)	11 (35,49%)	30 (35,71%)	14 (33,33%)
Expert (≥81)	0 (0%)	(%)	2 (6,46%)	6 (7,15%)	19 (45,23%)
<b>TOTAL</b>	22	18	31	84	42
<b>Average</b>	18,18 (8-22)	48,88 (17-55)	59,03 (34-68)	59,04 (39-67)	79,04 (68-93)

Source: Self-elaborated.

## DISCUSSION

Our results are similar to other studies with similar designs, such as the study carried out by Moreno, A and collaborators in 2016, a descriptive, observational and cross-sectional study of 46 family doctors assigned to the General Hospital of the Zone with Family Medicine (HGZ MF); 2 from Irapuato, Guanajuato, where he evaluated their clinical competences in a similar way to our study; with a self-applying instrument of

100 reagents with ordinal scale to determine the levels of clinical aptitude, evaluated separately 19 sections; one of the highest averages was Arterial Hypertension with 83. With a level of "very low" (48%) and "low" (28%) when assessing the 19 sections together. In our study the G3 has an average of 59.04, however, the percentage of competition is 95.24% above the expected level, this divided into; 52,38% "Competent", 35,71% "Professional" level and finally, 7,15% at the "Expert" level. Similar to the results of the previous study, the cross-sectional study of Casas, D and collaborators in 2014, where they made an instrument for the evaluation of clinical aptitude attached to the clinical practice guidelines of 20 pathologies (including Systemic Arterial Hypertension), in 24 family doctors of the Mexican Social Security Institute; the clinical aptitude obtained was low and very low (91,6%). In our study in G3, the lowest levels of competition ("Beginner" and "Novice") are also the lowest percentage (4,78%).

On the other hand, Serrat, M and collaborators in 2016 carried out a descriptive, observational and cross-sectional study with a randomized representative sample of 165 nurses working with adult patients in community primary health care centers that will complete an evaluation test of theoretical knowledge about hypertension, where the score >72, 72 (equivalent to adequate competence) is achieved by 32,1% of the participants. Our results are above this sample since the G3 achieves 95,25% competent.

This is the first study known by the authors in which the effect of a curriculum of a Career in Medicine is evaluated, on the professional competencies of the interns for the identification and management of the Systemic Arterial Hypertension compared to other groups in training and with a group that is not exposed to health science training. The results corresponding to the specific competences increase as they progressively expose themselves to a curriculum in Medicine, this in comparison with those subjects who did not receive any training in the subject. This is manifested in the results obtained by G3 with a percentage of 95,24% above the level of competence (S. Dreyfus and H. Dreyfus, 1980). In the same way, the percentage of successes increased an increase of G0 with 32,72% to G3 with 69,04%. With respect to the other groups that the intervention does see an increase in the level of competencies from G1 to G2, because in G1 there is a percentage of 5,55% novices and in G2 there is no longer novices. Since G1 there is already a significant increase in the level of "Competent" with a percentage of 61,11% compared to G0 (9,09%). The average of G0 (28,18) almost doubles in G1 (48,88%); in G2 and G3 the average is almost the same (59,03 vs. 59,04), however, it remains at the expected "Competent" proficiency level of 41-60 points.

The result of the average observed is due to the distribution of the values and the standard deviations, since in G1 to G4. This average shows us the need to implement an extra educational program that allows to increase the G3 average to ensure that passengers have an adequate level of competence, such as locating those passengers who do not have the expected level and providing them with a course that allows them to clarify their doubts and needs about the identification and management of the Systemic Arterial Hypertension.

## CONCLUSIONS

The evaluated curriculum shows a linear growth on the development of professional skills on management and identification of HAS, however, it is likely to improve.

## References

1. Campbell DT, Stanley JC. Diseños experimentales y cuasi experimentales en la investigación social. Amorrortu. Buenos Aires. 1996.
2. Hernández-Sampieri R, Fernández-Collado C, Baptista-Lucio P. Metodología de la Investigación. México D. F.: Second Edition. McGraw-Hill. 1998.
3. Dreyfus S, Dreyfus H. "A five-stage model of the mental activities involved in directed skill acquisition". Operations Research Center, University of California, Berkeley. 1980.
4. Moreno A, *et al.* "Aptitud clínica del médico familiar en los principales motivos de consulta y temas prioritarios de la atención primaria". Arch Inv Mat Inf;VIII. 2016 (3):77-84.
5. Serrat M, *et al.* "Are nurse sufficiently well prepared to take on the detection of Hypertension?". Hipertensión y Riesgo Vascular. 2016 (33); 4: 126-132.
6. OMS. "Preguntas y respuestas sobre la hipertensión". Consult 25/06/2019. 2015. Available in: <https://www.who.int/features/qa/82/es/>
7. Clínica Universidad Navarra. "Hipertensión arterial esencial". Consult el 25/06/2019. 2019. Available in: <https://www.cun.es/diccionario-medico/terminos/hipertension-arterial-esencial>
8. Martínez J, *et al.* "diagnóstico y tratamiento de hipertensión arterial en el adulto MAYOR". Instituto Mexicano del Seguro Social. 2017.
9. Instituto Nacional de Salud Pública. Encuesta Nacional de Salud y Nutrición de Medio Camino. "Informe Final de Resultados". 2016. Available in: [http://oment.uanl.mx/wp-content/uploads/2016/12/ensanut\\_mc\\_2016-310oct.pdf](http://oment.uanl.mx/wp-content/uploads/2016/12/ensanut_mc_2016-310oct.pdf)
10. Gijón T, *et al.* "Documento de la Sociedad Española de Hipertensión-Liga Española para la Lucha contra la Hipertensión Arterial (SEH-LELHA) sobre las guías ACC/AHA 2017 de hipertensión arterial". Hipertensión y Riesgo Vascular. 2018 (35); 3: 119-129.
11. Secretaría de Salud. "Boletín Epidemiológico SINAVE Sistema Único de Información". Dirección General de Epidemiología. 2018. Available in: <https://www.gob.mx/cms/uploads/attachment/file/471274/sem24.pdf>
12. Secretaría de Salud. "Hipertensión arterial, causa de muerte en México y el mundo". Gobierno de México. 2016. Disponible en: <https://www.gob.mx/salud/prensa/hipertension-arterial-cause-de-muerte-en-mexico-y-el-mundo>

### How to cite this article:

Carlos E. Cabrera-Pivaral *et al.* 2020, Effect of A Medicine Training Program on Clinical Competences on the Identification and Management in the Systemic Arterial Hypertension. *Int J Recent Sci Res.* 11(01), pp. 37037-37040.  
DOI: <http://dx.doi.org/10.24327/ijrsr.2020.1101.5045>

\*\*\*\*\*