

Evaluation of graduated students from the School of Medicine through the EGEL results and ENARM score

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— Abstract—

The EGEL-Medicine and the ENARM allow us to infer the performance of the graduates and the educational quality of the institutions that train them. The purpose of this article is to describe the performance of university graduates of the Universidad Autónoma de Chiapas in the Human Medicine degree in the EGEL evaluations in the years 2018-2019 and ENARM in the years 2016-2020. This is a cross-sectional study with a convenience sample of 997, of which 70.11% corresponded to graduates of the 1993 curriculum and the rest (29.89%) to the 2013 plan. We looked over the National reports issued by CENEVAL (2018-2019) and CIFHRS (2016-2020), and the institutional records for graduating. In the EGEL-Medicine test, 95.6% of the graduates obtained satisfactory performance, and the rest were outstanding, obtaining averages greater than 8.5 in the degree (56.9%). The area of medical diagnosis was the best performing (90.4% with a satisfactory opinion). Concerning the ENARM, the percentage of those accepted increased by 10% in the last registration. Conclusions: The graduates with higher averages in the bachelor's degree are the ones who manage to obtain outstanding opinions in the EGEL-medicine test. UNACH has fallen in the national ranking in the ENARM, as well as its scores. The ENARM average obtained by UNACH graduates in the years 2016 to 2020 is slightly higher than the national one (61.3 vs 60.7).

Keywords:

Educational measurement; clinical competencies; medical education.

Mexico is one of the countries with the highest number of schools of human medicine; as of 2018, 160 universities were counted (Heinze *et al*, 2018), of which only 80 have been accredited (COMAEM, 2021). In recent years, the number of graduates with this degree has increased considerably, despite this, Mexico is still below the average of the countries belonging to the Organization for Economic Cooperation and Development (OECD), with 2.5 doctors per 1000 inhabitants (or fewer, according to geographical area). The number of specialists is also lower than in other countries (119 per 100,000 inhabitants). The medical specialization process is regulated by the Inter-institutional Commission for the Training of Human Resources (CIFRHS), through the National Evaluation for Medical Residency Applicants (ENARM), which selects doctors so they can study a medical specialty (approximately 17,000 in 2020 and 2021).

Every year, a number of doctors stop providing their services for various reasons, which justifies the need to train new doctors to occupy these places. Despite this, there are few mechanisms established for the regulation of the training of health personnel, which should range from the curriculum of universities, the number of graduates, and the number of places available to specialize. Among the instruments that allow us to compare the performance of medical graduates at the national level are the

General Graduation Exam to obtain the Degree in Medicine (EGEL-Medicine) and the ENARM. The Mexican Council for the Accreditation of Medical Education (COMAEM) has proposed the unification of criteria in the operation and evaluation of medical schools and colleges in our country, however, unifying the programs of national universities is a distant goal.

Both exams have been considered useful for measuring the knowledge and/or aptitude of a doctor, the EGEL is proposed as a means to determine if the graduate has the basic knowledge and skills for his/her performance as a general practitioner (López *et al*, 2015) and the ENARM, as a selection tool for those who wish to pursue a medical specialty (Guerrero *et al*, 2016). There is no exact methodology described in the Mexican literature to determine the quality of knowledge and aptitude in medical graduates. It has been used by other institutions in the medical training of the country to the professional examination or the Objective Structured Clinical Examination (ECO) as tools of greater objectivity, however, there is no information available in the national literature on which institutions apply these exams or the results of their graduates in them, being the EGEL and the ENARM the predominant tests according to what has been observed, prepared by external, standardized, thus allowing the comparative analysis between institutions (Flores *et al*, 2012).

The EGEL-Medicine and ENARM exams allow us to analyze the performance of graduates, although there are competencies that cannot be

evaluated in depth in this way, such as skills or abilities, they can help establish areas of improvement for the quality of the institutions that teach the degree in medicine (Flores *et al*, 2001). Determining the educational institution's training quality and the skills of its graduates is important to guarantee the adequate training of health professionals, allowing graduates better future job opportunities and higher quality health services for users. The instruments to be analyzed only evaluate the knowledge of the graduates (the exams to be analyzed present the performance of the graduates only in terms of knowledge), but allow us to infer weaknesses or strengths in the institutional study plans and programs. Following this, this analysis summarizes the findings related to the general average of the degree, performance in the EGEL-Medicine during the years 2018-2019 and the ENARM from the years 2016 to 2020 of the graduates of the Faculty of Human Medicine C-II of the UNACH.

EGEL-MEDICINE AND ENARM

The Ministry of Public Education (SEP), according to the Official Gazette of the Federation in its agreement 286, from 2000, established the General Graduation Exam to obtain a bachelor's degree (EGEL) by the National Center for the Evaluation of Higher Education (CENEVAL) as a graduation process in Mexico. This evaluation is applied at the national level and seeks to evaluate the essential knowledge in the bachelor's degree for the exercise of the profession. The exam consists of 193 multiple-choice agents and comprises the following areas:

- Health promotion/prevention
- Medical Care: Medical Diagnosis
- Healthcare: Treatment and Evaluation
- Sociomedicine

The results are classified into three levels of performance: unsatisfactory (ANS), satisfactory (DS), and outstanding (DSS). To pass the exam, the sustainer must obtain at least three areas with satisfactory or outstanding performance (satisfactory performance). It may also be that of the four areas, he or she gets at least two with outstanding performance and the remaining with satisfactory performance (Outstanding Performance). At the national level, the areas of best (outstanding) performance are medical diagnosis and health promotion.

In the case of UNACH, the Internal Regulations for Professional Evaluation for graduates of the Faculty of Human Medicine of UNACH,

approved by the University Council during the session held on October 11, 2001, points out that the options to obtain the degree are:

- Recognition of academic achievement
- Recognition of academic achievement with written congratulations or honorable mention
- Thesis evaluation (research)
- General knowledge assessment
- Evaluation through supervised technical assistance
- Evaluation by general graduation examination (EGEL-CENEVAL)

Students with a bachelor's degree GPA higher than 9 are entitled to graduation by academic achievement. Those who choose the graduation option through the EGEL-Medicine have averages below nine. The annual reports of the EGEL have been available online since 2016, although in the case of the Universidad Autónoma de Chiapas, the results are reported together for the two campuses: II, located in Tuxtla Gutiérrez, Chiapas, and IV, in Tapachula, Chiapas. This data can have a great impact on the evaluation of this institution since both faculties have different accreditation processes at the time of writing this article. The data of this study correspond only to Campus II.

The Inter-institutional Commission for the Training of Human Resources for Health (CIFRHS) is the body in charge of regulating entry to medical specialization programs in Mexico. Per the Official Mexican Standard NOM-001-SSA3-2012 for the organization and operation of medical residences, doctors are selected by the ENARM, which is applied annually following the call issued. Passing this exam does not guarantee admission, as each hospital can set its selection criteria.

Therefore, the objective of this study was to describe the performance of university graduates of the Autonomous University of Chiapas with a bachelor's degree in Human Medicine using the EGEL evaluations in the years 2018-2019 and ENARM in the years 2016-2020.

METHODOLOGY

The universe corresponded to the graduates of the School of Human Medicine Dr. Manuel Velasco Suárez, C-II of the UNACH. The sample was selected for convenience and made up of the total number of students who obtained passing grades in the EGEL evaluation and graduated during the 2018-2019 period, with a total of 997 graduates.

We manually captured the information, considering the passing grades in each area of the evaluation according to the scale provided by CENEVAL:

- Unsatisfactory (S) 700-999 points
- Satisfactory (TDS) 1000-1049 points
- Outstanding (TDSS) 1150-1300 points

In addition, an analysis of the averages obtained in the ENARM by the UNACH graduating doctors is presented. These data were obtained from the academic reports presented by CIFHRS from 2016 to 2020, clarifying that they do not correspond to those who presented the EGEL, since that is a different analysis. The data were captured in Excel spreadsheets and then processed with the SPSS statistical program version 25.

RESULTS

Data were collected from 997 graduates who reached the passing grade in the EGEL-Medicine, in an age range of 23 to 35 years, with a mean of 27.80 and a standard deviation of 1.505. 51.1% (509) of the sample are men, and 48.9% (488) are women. Of the total sample, 70.11% corresponded to graduates of the 1993 study plan and the rest (29.89%) to the 2013 plan.

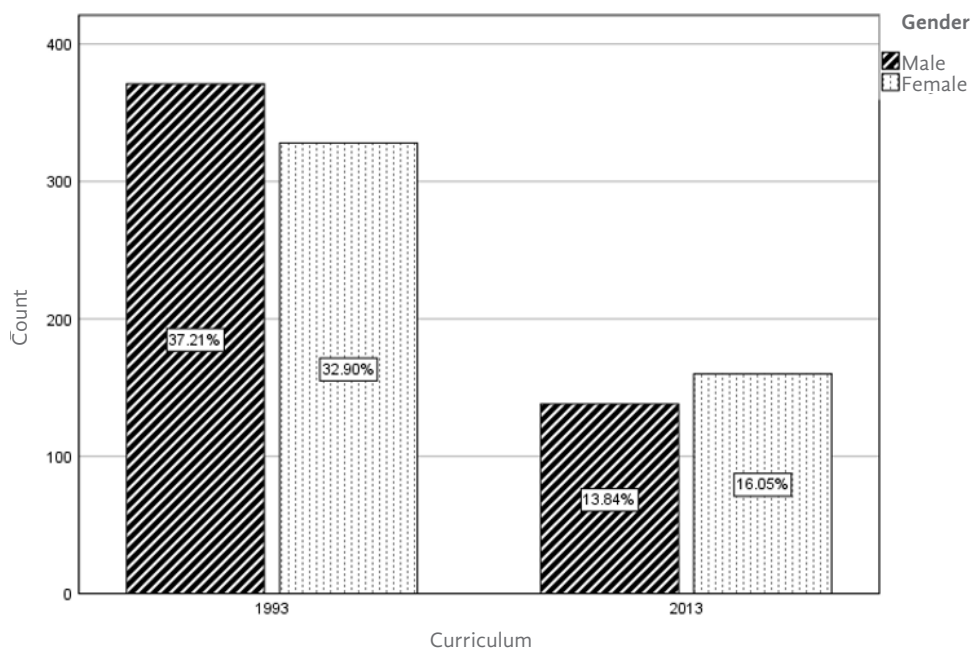


Figure 1. Distribution of total graduates concerning curriculum and gender. Source: Elaboration from the Graduation Department's institutional archives de Titulación. School of Human Medicine "Manuel Velasco Suárez, Campus II UNACH"

Regarding the year of graduation, 75.1% (749) of graduates graduated in 2019 and 24.9% (248) in 2018.

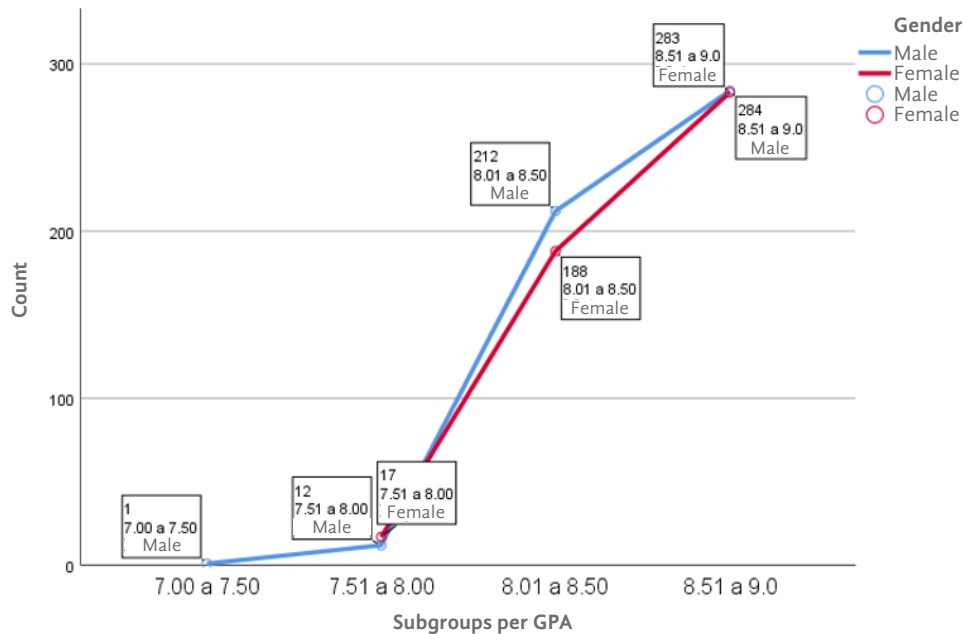
GPA's obtained during the bachelor's degree for both curricula ranged from 7.45 to 8.99, with a mean of 8.5305 and a standard deviation of 0.26059.

Table 1
Grade Point Average of Graduates

	Frequency	Percentage (%)
7.00 a 7.50	1	0.1
7.51 a 8.00	29	2.9
8.01 a 8.50	400	40.1
8.51 a 9.00	567	56.9
Total	997	100

Source: Elaboration from the Graduation Department's institutional archives de Titulación. School of Human Medicine "Manuel Velasco Suárez, Campus II UNACH"

Table 1 groups by GPA ranges of graduates, observing that the group with the highest frequency (56.9%) were those who obtained a bachelor's degree GPA between 8.51 to 9.0 (567), followed by the range between 8.01 to 8.50, with 40.1% (400).



Source: Elaboration from the Graduation Department's institutional archives de Titulación. School of Human Medicine "Manuel Velasco Suárez, Campus II UNACH"

Figure 2 shows that, according to the GPA, those with the lowest scores (7.1 to 8.0) correspond to 30 graduates, of whom 17 are women. In the following groups, the male-to-female ratio was comparable. Regarding the opinion obtained in the EGEL-Medicine, 95.6% of the graduates showed a satisfactory performance, and 4.4% of the students presented an outstanding performance.

Table 2

The ratio between GPA, EGEL-Medicine result, and Curriculum

Average	Plan of study	Satisfactory	Dictamen CENEVAL		*Group Total %	Total
			* Group Total %	Outstanding		
7.00 a 7.50	1993	1	0.14	0	0.00	1
	2013	0		0	0.00	
7.51 a 8.00	1993	24	3.43	1	0.14	25
	2013	4	1.34	0	0.00	4
8.01 a 8.50	1993	272	38.91	10	1.43	282
	2013	112	37.58	6	2.01	118
8.51 a 9.00	1993	378	54.08	13	1.86	391
	2013	162	54.36	14	4.70	176
Total	1993	675	96.57	24	3.43	699
	2013	278	93.29	20	6.71	298
	Total	953	95.59	44	4.41	997

* The percentages presented were calculated concerning the total curriculum, corresponding to 1993 (699) and 2013 (298) respectively.

Source: Prepared from institutional files of the Degree Department School of Medicine "Dr. Manuel Velasco Suárez, Campus II." UNACH

Table 2 shows the distribution of graduates concerning the study plan and opinions obtained in the EGEL-Medicine. Of the 1993 study plan graduates, 96.56% (675) were satisfactory and 3.43% (24) outstanding. In the 2013 study plan, graduates with satisfactory grades were 93.29% (278) and 6.71% (44) outstanding.

Table 3
Overall results by areas evaluated in the EGEL-Medicine

	Health promotion		Medical diagnosis		Treatment and evolution		Sociomedicine	
	N	%	N	%	N	%	N	%
Unsatisfactory	345	34.6	60	6	19	1.9	50	5
Satisfactory	622	62.4	901	90.4	760	76.2	794	79.6
Outstanding	29	2.9	31	3.1	217	21.8	153	15.3
Total	996	99.9	992	99.5	996	99.9	997	100
Lost	1	0.1	5	0.5	1	0.1		

Source: Prepared from institutional files of the Degree Department School of Medicine "Dr. Manuel Velasco Suárez, Campus II." UNACH.

Regarding the areas evaluated in the examination, it was observed that medical diagnosis is the best performing in graduates (90.4%), followed by treatment and evolution (76.2%), both with a satisfactory opinion. However, it is the area of treatment and evolution in which graduates reach the highest number of outstanding opinions (21.8%). Health promotion is the area with the lowest performance of unsatisfactory opinions.

ENARM

From the available open database, records were obtained in terms of the number of supporters by Faculties and Schools of Medicine in the period between 2016 and 2020.

Table 4
ENARM results during the period 2016-2020 of the graduates of the Universidad Autónoma de Chiapas

Year	National Ranking	Sustaining	Accepted	Average grade	National Average	Acceptance %
2016	34	609	113	62.347	76.06	18.56
2017	50	758	134	62.78	62.05	17.68
2018	45	794	154	63.22	62.1	19.4
2019	67	968	172	60.054	60.13	17.77
2020	66	1028	344	58.5	58.3	33.46

Source: Own elaboration with data obtained from the annual academic reports CIFRHS (2016-2020)

114 Mexican universities applied the ENARM during 2016 and 2017, while in 2018, there were 122. In 2019, 131 participated, and in 2020 it increased to 136. Not all graduates of national universities present the ENARM on an annual basis. Table 4 indicates that the UNACH has dropped in the national ranking of universities (although, the number of universities increases year by year) the average achieved in the ENARM has also dropped. The percentage of accepted students increased by more than 10 percentage points on the last record.

Table 5

Ranking of Mexican universities by GPA obtained by applicants accepted into the ENARM from 2016 to 2020

Place	Institution	2020	2019	2018	2017	2016	Average
1	Univ. Panamericana	69.76	74.498	76.7	77.02	73.46	74.2876
2	ITESM. - Campus Cdmx	65.93	68.622	70.75	69.4	68.348	68.61
3	Univ. Aut. De Querétaro	63.58	66.241	67.98	70.93	68.371	67.4204
4	Univ. La Salle	63.72	66.873	69.22	69.13	67.779	67.3444
5	Univ. De Guanajuato	63.48	66.193	68.59	69.47	65.106	66.5678
6	Univ. Aut. De B.C., U. Mexicali	62.32	65.865	67.95	68.87	66.177	66.2364
7	Univ. Aut. De Coahuila, U. Saltillo	62.72	64.901	69.27	68.34	65.87	66.2202
8	Univ. Aut. De Aguascalientes	62.85	66.781	67.93	67.52	65.739	66.164
9	Univ. Aut. De Coahuila, U. Torreón	63.02	65.168	68.43	68.24	65.924	66.1564
10	Univ. Aut. De Chihuahua	61.96	64.711	67.54	67.81	66.419	65.688
11	Univ. Aut. De B.C., U. Tijuana	62.27	64.717	67.39	68.2	65.614	65.6382
12	Univ. Aut. De Nuevo León	61.39	63.88	66.04	69.05	67.509	65.5738
13	Univ. De Guadalajara, U. Los Altos	61.76	62.786	65.22	67.24	68.669	65.135
14	Univ. Aut. De Yucatán	62.14	64.952	65.96	66.43	65.269	64.9502
15	Univ. Aut. Del Edo. De México	62.1	63.722	66.51	66.4	64.965	64.7394
16	Univ. Aut. De San Luis Potosí	64.07	68.144	70.09	61.76	59.602	64.7332
17	Univ. De Sonora	62.37	64.056	66.52	66.69	62.954	64.518
18	UNAM FM CU	61.67	63.935	65.85	65.77	64.409	64.3268
19	Univ. Cuauhtemoc - Plantel San Luis Potosi	60.11	64.639	67.3	66.43	62.183	64.1324
20	Univ. De Guadalajara	61.8	64.1	66.18	64.3	64.123	64.1006
21	Univ. De Monterrey	62	65.31	66.56	67.51	58.85	64.046
22	Univ. Aut. De B.C., U. Ensenada	60.96	61.996	65.27	64.88	64.81	63.5832
23	Univ. De Guadalajara, U. Cd. Guzmán	59.75	63.901	63.6	65.02	64.238	63.3018
24	Univ. De Colima	61.14	62.059	63.98	63.8	64.922	63.1802
25	Univ. Del Valle De México - Campus Hermosillo	57.62	60.048	61.66	64.93	71.556	63.1628
26	Univ. Aut. De Hidalgo	60.16	61.673	63.63	65.7	63.531	62.9388

27	Univ. Aut. De Nayarit	59	61.305	63.64	66.48	64.254	62.9358
28	Univ. Anáhuac	59.98	62.249	64.09	64.57	62.675	62.7128
29	Univ. Cuauhtémoc - Campus Aguascalientes	58.64	62.571	65.12	63.81	62.539	62.536
30	Univ. Las Américas Puebla	60.18	61.257	65.05	65.23	60.794	62.5022
31	Univ. De Celaya	59.36	61.098	63.69	65.5	62.641	62.4578
32	Univ. Aut. De Morelos	60.26	62.981	65.4	62.67	60.409	62.344
33	Univ. De Guadalajara Centro Universitario De La Costa	58.77	61.161	63.75	64.77	61.909	62.072
34	Univ. Mich. De San Nicolás De Hidalgo (Zamora)	59.67	62.294	63.55	62.86	61.333	61.9414
35	Univ. Aut. Metropolitana, U. Xochimilco	60.09	61.538	63.1	63.47	61.075	61.8546
36	Univ. Latina De México	58.62	60.903	62.72	63.66	63.36	61.8526
37	Univ. Montemorelos	59.26	59.922	63.61	64.77	61.131	61.7386
38	Esc. Médico - Militar Sedena	60.22	64	55.56	66.56	62.148	61.6976
39	Univ. Aut. De B.C. - Campus Valle De Las Palmas	59.4	61.43	64.22	62.7	60.576	61.6652
40	Univ. Aut. De Cd. Juárez	58.83	60.994	63.03	63.43	61.701	61.597
41	IPN Esc .Sup. Medicina	59.25	61.117	62.74	62.8	61.629	61.5072
42	Univ. Veracruzana, U. Cd. Minatitlán	59.22	61.324	62.03	62.77	62.055	61.4798
43	Univ. Del Valle De México, Campus Qro	57.88	60.649	63.14	63.48	61.971	61.424
44	Universidad Autónoma de Chiapas	58.5	60.054	63.22	62.78	62.347	61.3802
45	Centro Est. Univ. Xochicalco, U. Tijuana	59.4	61.482	63.26	62.48	60.113	61.347
46	Univ. Aut. De Zacatecas	58.94	60.723	62.47	62.36	62.047	61.308
47	Univ. Aut. De Guadalajara	58.51	61.148	63.7	62.1	61.025	61.2966
48	Univ. Veracruzana, U. Poza Rica	57.36	59.725	62.95	63.47	62.845	61.27
49	Univ. Popular Aut. Del Edo. Puebla	58.72	60.801	62.72	62.38	61.576	61.2394
50	Univ. Juárez Del Edo. Durango, U. Gómez Palacio	59.21	59.608	62.94	63.07	61.347	61.235
51	Univ. Del Mayab	59.62	62.326	62.73	63.86	57.213	61.1498
52	Univ. Del Valle De México - Campus Zapopan	58.32	60.781	62.25	63.45	60.925	61.1452
53	UNAM Fes Iztacala	58.91	60.666	62.66	61.87	60.242	60.8696
54	Univ. Veracruzana, U. Veracruz	58.66	60.089	60.94	63.19	61.242	60.8242
55	Univ. Veracruzana, U. Xalapa	59.32	60.388	61.83	61.71	60.762	60.802
56	Univ. La Salle - Campus Cd. Victoria	58.14	60.026	61.34	62.36	59.923	60.3578
57	Univ. Del Valle De Atemajac	57.28	61.126	62.25	62.32	58.508	60.2968
58	UNAM Fes Zaragoza	59.14	59.818	61.7	61.09	59.661	60.2818
59	Univ. Juárez Del Edo. Durango, U. Durango	57.97	59.986	62.34	61.6	59.346	60.2484
60	Univ. Aut. De Campeche	58.48	58.957	62.34	60.89	59.516	60.0366

61	Univ. De Quintana Roo	57.69	57.738	59.59	60.45	64.591	60.0118
62	Univ. Aut. Benito Juárez De Oaxaca	58.11	59.515	60.65	60.9	59.547	59.7444
63	Univ. Aut. De Tamps, U. Matamoros	55.71	57.42	60.16	63.52	61.788	59.7196
64	Univ. Aut. De Durango - Campus Zacatecas	55.94	57.093	59.06	64.23	62.25	59.7146
65	Univ. Aut. De Sinaloa	56.77	60.326	62.34	60.42	58.034	59.578
66	B. Univ. Aut. Puebla (Puebla)	58.09	59.129	60.9	60.04	59.394	59.5106
67	Univ. De Durango - Campus Cd. Juarez	52.35	56.938	58.52	65.86	63.416	59.4168
68	Univ. Cuauhtemoc - Plantel Guadalajara	56.36	57.625	62.02	63.59	57.333	59.3856
69	Univ. Aut. De Tamps, U. Tampico	58.33	61.367	63.43	56.89	56.553	59.314
70	Univ. Guadalajara Lamar - Campus Vallarta	56.96	58.994	59.06	60.78	60.72	59.3028
71	Centro Est. Univ. Xochicalco, U. Ensenada	56.36	58.18	61.2	61.16	59.469	59.2738
72	Univ. West Hill Institute S.C.	56.62	58.193	60.48	61.75	58.993	59.2072
73	Univ. Aut. De Guerrero	55.48	57.011	58.87	62.91	61.631	59.1804
74	Univ. Mich. De San Nicolás De Hidalgo (Morelia)	57.74	59.26	60.99	59.89	57.954	59.1668
75	B. Univ. Aut. Puebla (Tehuacán)	58.21	58.443	60.97	58.52	59.629	59.1544
76	Centro Est. Univ. Xochicalco Campus Mexicali	59.33	62.873	65.31	59.45	48.444	59.0814
77	Univ. Del Valle De México - Campus Cd. Reynosa	57.75	58.442	61.2	60.59	56.064	58.8092
78	Univ. Veracruzana, U. Cd. Mendoza	57.24	58.436	59.78	59.11	59.461	58.8054
79	Univ. Del Valle De México - Campus Cd. Victoria	55.9	58.047	58.1	57.8	63.627	58.6948
80	Univ. Guadalajara Lamar - Campus Inglaterra	56.95	59.108	61	56.48	59.737	58.655
81	Univ. Del Noreste	55	56.541	59.48	59.59	62	58.5222
82	Univ. Aut. De Guadalajara, Campus Tabasco	57.16	58.608	61.46	58.27	57.085	58.5166
83	Univ. Vasco De Quiroga - Campus Santa María	56.9	59.845	60.23	58.92	56.61	58.501
84	IpN Esc. Nal. Med. Y Homeopatía	57.29	57.786	59.83	59.65	57.919	58.495
85	Univ. Quetzalcóatl De Irapuato	56.52	57.693	60.25	59.73	58.005	58.4396
86	Estudios En El Extranjero	55.65	58.017	59.51	58.87	58.664	58.1422
87	Univ. Regional Del Sureste	56.71	57.687	59.72	58.51	57.865	58.0984
88	Univ. Cristobal Colon - Veracruz	55.29	57.118	60.77	58.76	58.045	57.9966
89	IpN Centro Interdisciplinario De C. Salud	57	57.173	59.25	58.96	57.17	57.9106
90	Univ. Latinoamericana	56.33	57.07	58.75	58.72	58.15	57.804
91	Univ. Del Valle De México - Campus Saltillo	55.49	55.454	59.07	60.29	57.825	57.6258
92	Univ. Del Valle De México - Campus Villahermosa	52.97	56.489	61.77	59.2	57.246	57.535
93	Univ. Aut. De Tlaxcala	55.17	55.452	57.62	61.43	57.907	57.5158

94	Univ. Olmeca	53.37	55.051	55.48	58.97	60.067	56.5876
95	Univ. Justo Sierra	54.6	55.371	58.53	58.37	56.049	56.584
96	Univ. Juárez Aut. De Tabasco	54.17	55.918	58.12	57.27	55.78	56.2516
97	Univ. Juárez Aut. De Tabasco División Académica	53.82	54.293	57.24	55.9	59.644	56.1794
98	Univ. Aut. De Durango - Campus Durango	53.59	55.012	55.76	58.02	55.948	55.666
99	Esc. Med. Tominaga Nakamoto	53.22	54.583	57.28	56.23	55.322	55.327
100	Inst. Est. Superiores De Chiapas -Campus Tuxtla Gutierrez	54.01	55.011	56.53	54.93	54.26	54.9482
101	Univ. Aut. España De Durango	55.07	52.973	57.12	56.43	52.042	54.727
102	Univ. México-Americana Del Norte	52.76	53.358	55.23	55.17	55.395	54.3826
103	Inst. de Ciencias y Estudios Sup. De Tamaulipas	51.72	53.628	55.28	56.41	54.728	54.3532
104	Inst. Est. Superiores De Chiapas - Campus Tapachula	52.66	51.564	54.05	54.22	54.744	53.4476
105	Inst. Est. Superiores Tepeaca	53.16	54.432	53.86	54.08	50.749	53.2562
106	Univ. Hipócrates	52.02	51.844	52.82	54.34	55.022	53.2092
107	Esc. Libre De Homeopatía De México	52.85	51.569	53.62	54.39	50.597	52.6052

Source: Own elaboration with data obtained from the annual academic reports CIFRHS (2016-2020)

For Table 5, only those universities with available data for the aforementioned years were taken into account, bringing the total to 107 (out of 136). When performing the global analysis, the maximum corresponded to 74.28 and the minimum to 52.60, with a range of 21.68, mean of 60.75, variance of 13.14, and standard deviation of 3.6.

The Universidad Autónoma de Chiapas ranks 44th according to the average obtained in the years analyzed in the ENARM. The maximum average obtained in that period corresponded to 63.22 and the minimum to 58.5, with a mean of 61.38, a range of 4.72, a variance of 3.26, and a standard deviation of 1.80.

DISCUSSION

In the same way as Guerrero, Romero, and Noriega (2015), the male population in our study was greater than the female, contrary to the national report for the EGEL-Medicine 2018 and 2019. Regarding the average graduation from the bachelor's degree, the national report in 2018 indicated that 66% and in 2019 68% of the supporters obtained an average between 8.0 and 9.0, unlike this study, where 97% of the sample obtained averages in this same range. Regarding the opinion obtained in the EGEL-Medicine, 95.6% of the graduates presented a satisfactory performance, a figure higher than the

national percentage (47.6% in 2018 and 53.3% in 2019), 4.4% of the students presented an outstanding performance (7.4% in 2018 and 12.1% in 2019).

We highlight that, at UNACH, unlike other universities, students with a GPA rate higher than 9.0 obtain their degrees by academic merit. That is why we cannot compare the results obtained with those reported by authors such as Guerrero, Romero, and Noriega (2015), who found that graduates with averages above 9.0, obtained outstanding opinions more frequently, although in this study it could also be seen that graduates with a GPA between 8.51 to 8.99, also obtained the highest scores and outstanding opinions in the EGEL-Medicine.

In the evaluation by areas, the best performing at the national level corresponds to medical diagnosis with 62% of satisfactory opinions in 2018 and 69.2% in 2019, against 90.4% of the population studied, followed by treatment and evolution with 52.3% in 2018 and 57.1% in 2019 against 76.2% of the graduates of UNACH campus II. The area of *health promotion* was the lowest performing, as 34.6% of graduates obtained an unsatisfactory opinion, which is lower than the national one (60.7% in 2018 and 56.1% in 2019). At the national level, *health promotion* is the area with the highest number of graduates with an outstanding opinion, medical diagnosis in 2018 (15.1%) and *Health promotion* in 2019 (20.3%). For medical graduates of UNACH C-II, in the area of treatment and evolution, 21.8% of the opinions were outstanding.

In the work carried out by Ramiro *et al* (2017), which studies trends in the percentage of accepted students per institution during 2001-2016, it was observed that the national universities with the highest number of accepted students are the Universidad Panamericana, Universidad Autónoma de San Luis Potosí, Instituto Tecnológico de Estudios Superiores de Monterrey, Universidad la Salle, and Universidad de Guanajuato. The lowest number of accepted correspond to the Centro de Estudios Universitarios Xochicalco Mexicali, Universidad Autónoma de Durango, Escuela Libre de Homeopatía, Instituto de Estudios Superiores Tepeaca, and Universidad México-Americana del Norte. In this study, the average of those accepted per institution in the years 2016-2021, was taken as a reference, since the percentage of accepted and graduates taking the exam are extremely different between institutions, however, in this analysis great coincidences were observed regarding the universities with the best averages in the last five years concerning the analysis carried out by Ramiro *et al* (2017); where he also mentions that the percentage of acceptance from 2001 to 2016 in the Universidad Autónoma de Chiapas was 21%.

CONCLUSIONS

Although there are bodies dedicated to unifying criteria for the operation of educational institutions in medicine, to raise and maintain quality standards, the curricula and the results in national regulatory evaluations are so disparate that they represent difficulties for comparison.

In the case of the Autonomous University of Chiapas, the statistical data corresponding to the ENARM are granted jointly and not by campus, as in the case of other universities, which makes it even more difficult to follow up on graduates, since, even in the accreditation processes, campuses present different opinions.

Regarding the graduation GPA with the opinions of the EGEL, comparing the results with other studies was not possible, since the graduates of the UNACH with the highest average have different graduation process options. The results obtained in this study show a better performance concerning the national average, although in the area of health promotion, it is clear that the students' performance was not satisfactory, so it is necessary to improve the curriculum. It was also observed that the graduates with higher averages, the majority obtained outstanding opinions in the EGEL-Medicine.

Evaluating students' knowledge is a challenge at all levels of education and as the curricula are so different between institutions, the analysis of the results of the EGEL-Medicine and ENARM could help to make adjustments in all the institutions that teach the degree.

The number of universities with a degree in Medicine increases year after year, which has contributed to UNACH dropping in the national ranking in the ENARM, however, the averages of graduates continue to be slightly above the national average. The average in the ENARM obtained by UNACH graduates in the years 2016-2020 is slightly higher than the national average of 61.3 vs 60.7.

RECOMMENDATIONS

- To obtain a better picture regarding the performance of UNACH graduates at ENARM, it is necessary that, as in other institutions, the number of accepted students and their GPAs are reported by campus, which must be managed by UNACH before CIFRHS.
- It is necessary to place greater emphasis on the teaching of knowledge in the area of health promotion since it is the area of lowest performance of graduates.
- Given the new modality of choosing specialty positions, carrying out the statistical analysis of the averages obtained by area of knowledge in the ENARM could be of help to university graduates, since it will

allow those who have a specialty in mind to focus on the study of the areas in which their peers have the greatest deficiencies, allowing to increase the educational quality of the institution.

- The number of graduates and graduates who took the ENARM varies greatly concerning the institution and the year, therefore, the analyses of trends in terms of average obtained by the examinees could present a better picture concerning the performance of the graduates by institution, it is suggested that future analyses take this variable into account.

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