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Systematic Review

The importance of learning in aesthetic surgery during plastic surgery residency

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ABSTRACT

Given the challenges and the long journey that every plastic surgeon undergoes, it is commendable to witness the training received by residents in plastic and reconstructive surgery in aesthetic procedures (body contouring, breast augmentation, mastopexy, rhinoplasty, facelift, blepharoplasty) during their final year of training at a tertiary institution in a country like Mexico. It is important to verify whether they develop optimal and comprehensive training to face their professional lives. The number of aesthetic surgeries performed by 12 residents during their final year of plastic surgery training was captured from clinical records for the years 2022 and 2023. The data were compiled into a database using Microsoft excel V16.47.1 and subsequently analyzed using statistical package for social sciences (SPSS) software, v23.0. Significant differences were found among residents (p value=0.02) regarding the number of procedures performed by each one. However, according to the presented diagnoses, each resident faces the same cases, which are the most requested in Mexico and worldwide. This review study concludes that final-year residents in plastic surgery undergo training adhering to the academic program established by the PUEM, performing the most common aesthetic procedures in Mexico and worldwide according to the diagnoses presented by each resident.

Keywords: Training in plastic surgery, Teaching in plastic surgery, Education in plastic surgery

INTRODUCTION

The field of plastic and reconstructive surgery, as well as the training of plastic and reconstructive surgeons, has continuously evolved over the past 100 years. The specialty has evolved over a similar period worldwide, although the specific format of training differs from one country to another. At the same time, as training in plastic surgery has changed, so has postgraduate medical education.[1]

While there are multiple educational theories, many of them have influenced modern postgraduate medical education and training. Among these, prominent theories include adult learning theory, Bloom's taxonomy, Miller's pyramid, and the Dreyfus model of skill acquisition. These are just a small sample of educational theories, but they have had the greatest influence on modern postgraduate medical education.[2-5]

Since 2021, there are 84 integrated plastic surgery programs and 50 independent programs in the United

States. Integrated plastic surgery programs must include 72 months of education and training, while independent programs must include 36 months. Residents in independent programs must have completed residencies in general surgery, neurological surgery, orthopedic surgery, otolaryngology, thoracic surgery, urology, vascular surgery, or maxillofacial surgery, with at least 2 years of general surgery as part of their curriculum. Residents in integrated plastic surgery programs must demonstrate experience in various basic clinical surgical areas, including neurosurgery, abdominal surgery, breast surgery (oncologic and aesthetic), emergency medicine, pediatric surgery, surgical critical care, surgical oncology (excluding breast), transplantation, trauma management, and vascular surgery.

The Accreditation Council for Graduate Medical Education has established the number of procedures for integrated and independent programs. To meet basic surgery requirements, integrated residents must complete 20 cases each in three areas: gastrointestinal surgery, breast/oncologic surgery, and trauma/critical care/anesthesia. Integrated and independent residents must complete the same number of cases during their dedicated plastic surgery training.[6]

The purpose of the following study is to demonstrate the medical-surgical preparation of fourth-year residents in aesthetic and reconstructive plastic surgery to perform surgical procedures according to the program established by the Faculty of Medicine of the National Autonomous University of Mexico (UNAM), known as the Unique Plan of Medical Specialties (PUEM). These procedures correspond to aesthetic surgery and are endorsed and certified by the Mexican Council of Plastic, Aesthetic, and Reconstructive Surgery and the Mexican Association of plastic, aesthetic, and reconstructive surgery. These institutions have recently added the word "aesthetic" to the full designation of the PUEM, with the aim of having the professional certificate contain the new name of the specialization, giving formal professional status to the practice of aesthetic medicine. This satisfies the academic and operational need to define the activities of the clinical field and prevent the professional invasion of false specialists in aesthetic surgery, strengthening and preparing residents to face and perform these types of surgeries in their professional lives.

METHODS

A systematic literature review was conducted using the PubMed, ClinicalKey, ScienceDirect, and Ovid databases, utilizing medical subject headings (MeSH) search terms such as 'plastic surgery training,' 'plastic surgery learning,' 'plastic surgery teaching,' and 'plastic surgery resident education.' Researchers examined the titles and abstracts of articles retrieved from various years. Only articles that met the following criteria were included: training, education, or learning in plastic and reconstructive surgery residency, which were evaluated for their effectiveness and suitability for educational purposes.

Additionally, the number of aesthetic surgeries (body contouring, breast augmentation, breast reduction, mastopexy, facelift, rhinoplasty, and blepharoplasty) performed by 12 residents during their final year of training in plastic, aesthetic, and reconstructive surgery was captured from clinical records belonging to a public institution in Mexico for the years 2022 and 2023. A database was created using Microsoft excel V16.47.1, and statistical analysis was subsequently performed using statistical package for social sciences (SPSS) software, v23.0.

RESULTS

The purpose of this academic study is to determine which and how many surgical procedures a resident performs during their training as a subspecialist in plastic surgery. To achieve this, we initially present the list of procedures performed in the plastic and reconstructive surgery department of the Hospital General de México 'Dr. Eduardo Liceaga' from 2022 to 2023, followed by a report on the number of procedures performed by each of the 12 medical residents assigned to the department during the specified period.

Table 1: Search terms.

Search terms	PubMed	Clinical key	ScienceDirect	Ovid
Plastic surgery training	17	8	11	6
Plastic surgery learning	8	5	3	4
Plastic surgery teaching	9	5	4	4
Plastic surgery resident education	13	3	1	3

Table 1 also shows the number of articles used for each keyword used in each of the search engines to collect the necessary information and that were useful for the systematic review.

Subsequently, the procedures were grouped into four categories (body contouring, facial, breast, and rhinological surgery), and the frequency with which each of the 12 residents performed surgical procedures in each category was quantified. Differences between each resident were then evaluated using the chi-square statistic for this purpose, with a significance level set at a p-value less than 0.05.

During the period between 2022 and 2023, a total of 671 cases were operated on by a group of 12 medical residents.

The 84% of the sample consisted of females and 16% of males, with 1 case (0.01%) being transgender. For the age group distribution, there were 46 cases (6.8%) under 19 years old, 145 cases (21.6%) between 20 and 29 years old, 169 cases (25.1%) between 30 and 39 years old, 125 cases (18.6%) between 40 and 49 years old, 120 cases (17.8%) between 50 and 59 years old, and 66 cases (9.8%) over 60 years old.

The average time required to perform the procedures, for the sample, is observed in Figure 1, where it is evident that 635 out of the total surgeries (94.6%) require between 1 and 4 hours for completion.

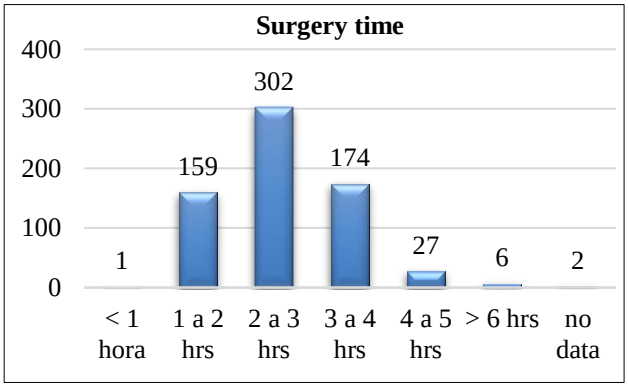

Figure 1: Surgery time.

In Figure 2, it can be seen that in 577 cases (85.9%), no auxiliary technology associated with the traditional surgical technique was used for the procedure.

In Table 2, the diagnoses under which patients were treated during the study period are listed, along with the corresponding abbreviations for each diagnosis.

In Table 3, the surgical procedures performed on patients during the study period are listed, along with the corresponding abbreviations for each procedure.

In Figure 3, the distribution of cases attended by each medical resident is shown, where it is evident that there is a significant variation in the number of surgical procedures performed by each medical resident (p=0.001).

Study and management diagnoses by each medical resident

In Tables 4 and 5, the study and management diagnoses for the cases attended by each medical resident are presented.

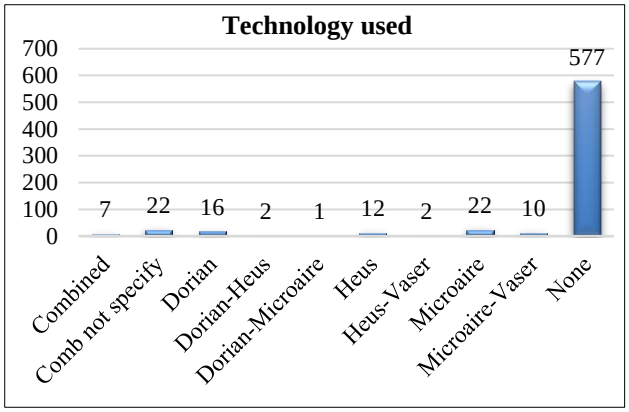

Figure 2: Technology used.

Study and management diagnoses by each medical resident

Table 6 presents the surgical procedures performed by each medical resident.

In Figure 4, the data obtained by grouping the surgeries performed into related categories are presented as follows: body contouring surgery, facial surgery, breast surgery, and rhinological surgery. It can be observed that, out of the total surgeries performed during the study period, 162 were body contouring surgeries (24.1%), 95 were facial surgeries (14.1%), 183 were breast surgeries (27.2%), and 231 were rhinological surgeries (34.4%).

Table 6 provides a summary of the surgeries performed by each resident categorized and shown in percentages.

Table 2: Diagnostics.

Abbreviations	Definition	Abbreviations	Definition
BA	Breast asymmetry	CIM	Chin implant malposition
BC	Blepharochalasis	MO	Microtia
CB	Carcinoma basocelular	SB	Supernumerary breast
BCC	Basal cell carcinoma	TB	Tuberous breasts
GC	Gender confirmation	NUEF	Necrosis of upper eyelid flap
HS	Hypertrophic scar	BF	Breast fold
PAS	Pathological abdominal scar	BP	Breast ptosis
SLE	Scar on the lower eyelid	EP	Eyelid ptosis
FFD	Fronto-facial dysplasia	PRS	Parry Romberg syndrome
GD	Gluteal deformity	SE	Senile eyelid

Continued.

Abbreviations	Definition	Abbreviations	Definition
MD	Mandibular deformity	AW	Abdominal wrinkles
ND	Nasal deformity	CW	Cervical wrinkles
RD	Respiratory difficulty	EW	Extremity wrinkles
SD	Septal deviation	FW	Facial wrinkles
IE	Implant exposure	RPM	Rhinophyma
IBI	Illness from breast implants	GIR	Gluteal implant rupture
GG	Gluteal granuloma	BIR	Breast implant rupture
GM	Gigantomastia	AS	Adenoma sequelae
NG	Nasal granuloma	GS	Gigantomastia sequelae
AH	Abdominal hernia	LS	Lefort sequelae
MH	Mammary hypoplasia	CLPS	Cleft lip and palate sequelae
MDH	Mandibular hypoplasia	MS	Mastitis sequelae
AL	Abdominal lipodystrophy	OS	Obesity sequelae
LLD	Limb lipodystrophy	WLS	Weight loss sequelae
GL	Gluteal lipoma	NT	Nasal trauma

Table 3: Surgical procedures (surgeries).

Abbreviations	Definition	Abbreviations	Definition
BA	Breast augmentation	ER	Ear reconstruction
AP	Abdominoplasty	RD	Rhytidectomy
CA	Chin advancement	GR	Granuloma resection
EB	Excisional biopsy	GMR	Gynecomastia resection
IB	Incisional biopsy	IR	Implant removal
BP	Blepharoplasty	BR	Breast reconstruction
BCP	Brachioplasty	CR	Chin reconstruction
SC	Scar correction	RR	Rhinophyma resection
IR	Implant replacement	RSP	Rhinoseptoplasty
BIP	Breast implant placement	SSR	Skin strip resection
CP	Cervicoplasty	MT	Mastectomy
CT	Capsulectomy	CAP	Combined aesthetic procedure
FI	Fat Infiltration	UEEP	Upper eyelid elevator plication
LS	Liposuction	OMP	Orbicular muscle plasty
AL	Abdominal liposuction	BL	Breast lift
CL	Cervical liposuction	BRM	Breast reduction mammoplasty
LE	Liposuction of extremities	BAM	Breast augmentation mammoplasty

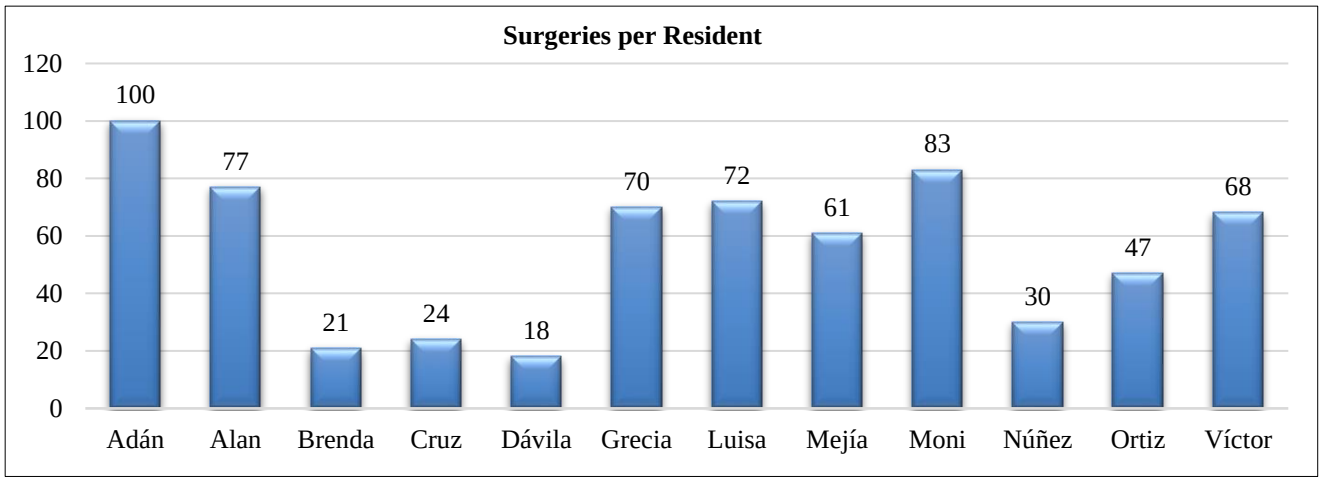

Figure 3: Surgeries per resident.

Table 4: Study diagnoses attended to by each medical resident ½.

Resident	CIM	MO	SB	TB	NUEF	BF	BP	EP	PRS	SE	AW	CW	EW	FW	RPM	GIR	BIR	AS	GS	LS	CLPS	MS	OS	WLS	NT
Adán				1			4	3			14			7	1						1			4	2
Alan				3			3			1	17			3											1
Brenda											2													1	1
Cruz						1	3				4														
Dávila							3	1			2						1								
Grecia		1				1	9	2		2	10			2											
Luisa			1				4	5			7			2			1					1		1	
Mejía							8	2		3	9			6		1								1	1
Moni	1		3			1	8		1		18	1	1	2				1		2			1	3	
Núñez											10			1											
Ortiz					1		3	1			10		1	1							1			1	
Víctor							1			2	11		1	2			1		1					1	1
Promedio																									

Table 5: Study diagnoses attended to by each medical resident ½.

Resident	BA	BC	CB	BCC	GC	HS	PAS	SLE	FFD	GD	MD	ND	RD	SD	IE	IBI	GG	GM	NG	AH	MH	MDH	AL	LLD	GL
Adán	2	3	1	2		1			1			30	1	4		1		5	1		10		1		
Alan			7	7						1		22		2				3			5		2		
Brenda		2		2								8						3					1	1	
Cruz		1		3								10									2				
Dávila		1		4								3						1		1				1	
Grecia		1		5								24		4	1			2			5		1		
Luisa		8		2	1		2	1			1	23		2				3			2		5		
Mejía		4		7						1		6		1				6			2		2	1	
Moni		3										22		3	1		1	3			4	1			
Núñez		1		1								8		2							6		1		
Ortiz		5		1								17		2				1			1				
Víctor		3		7								21						4			6		3	1	1
Promedio																									

Table 6: Surgical procedures performed by each medical resident.

Resident	BA	AP	CA	EB	IB	BP	BCP	SC	IR	BIP	CP	CT	FI	LS	AL	CL	LE	BAM	BL	BRM	MT	CAP	UEEP	OMP	ER	RD	GR	GMR	IR	BR	CR	RR	RSP	SSR
Adán	2	15			1	3		2	1					2	1	1		10	6	2	2	1	1			7	1	1				1	40	
Alan		18				6			1	2		3		1				6		8		1	2			3			1				25	
Brenda		2				2			1	2		3		1			1	1	1	2									1				9	
Cruz	1	4				1			2									1	3			1							1				10	
Dávila		3				2			1			1					1		4	1									2				3	
Grecia		8				5			3					4				4	10			1			1	2			3				28	
Luisa		13				13		1	2					1		1		1	3		3				1	1	2		4		1		25	
Mejía		9				5			1		1			3			1	2	12	3	2		3			6		1	2	1			8	1
Moni		21	1			2																												
Núñez		10				1			1					1				6								1							10	
Ortiz		10				5	2			1								1	3				1			1		1					20	2
Víctor	3	10		1		5	1		2			1		5	1		1	4	5	2						2		1	2				22	
Promedio																																		

Table 7: Surgeries of each category per resident.

Surgeries of each category per resident	Category				Total
	Body contouring	Face	Breasts	Rhinology	
Adán					
Count	20	13	25	42	100
% of resident	20.0	13.0	25.0	42.0	100.0
Alan					
Count	19	11	22	25	77
% of resident	24.7	14.3	28.6	32.5	100.0
Brenda					
Count	4	2	6	9	21
% of resident	19.0	9.5	28.6	42.9	100.0
Cruz					
Count	4	1	9	10	24
% of resident	16.7	4.2	37.5	41.7	100.0
Dávila					
Count	5	2	8	3	18
% of resident	27.8	11.1	44.4	16.7	100.0

Continued.

Surgeries of each category per resident	Category				Total
	Body contouring	Face	Breasts	Rhinology	
Grecia					
Count	11	8	23	28	70
% of resident	15.7	11.4	32.9	40.0	100.0
Luisa					
Count	15	17	15	25	72
% of resident	20.8	23.6	20.8	34.7	100.0
Mejía					
Count	15	15	23	8	61
% of resident	24.6	24.6	37.7	13.1	100.0
Moni					
Count	26	9	19	29	83
% of resident	31.3	10.8	22.9	34.9	100.0
Núñez					
Count	11	2	7	10	30
% of resident	36.7	6.7	23.3	33.3	100.0
Ortiz					
Count	13	8	6	20	47
% of resident	27.7	17.0	12.8	42.6	100.0
Víctor					
Count	19	7	20	22	68
% of resident	27.9	10.3	29.4	32.4	100.0
Total					
Count	162	95	183	231	671
% of resident	24.1	14.2	27.3	34.4	100.0

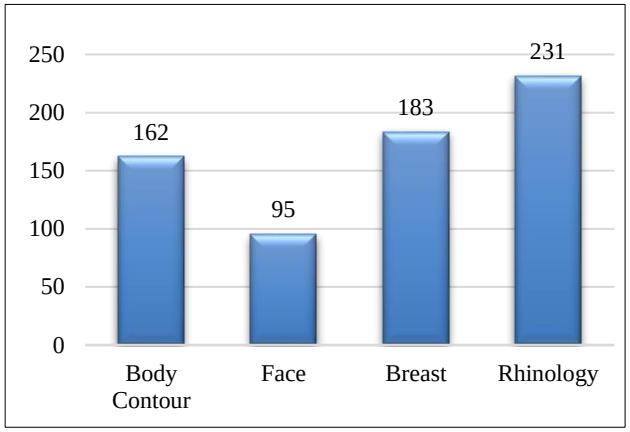

Figure 4: Surgical groups.

Upon evaluating the differences between each medical resident regarding the categories of surgeries performed, significant differences were found among residents (p value=0.02).

DISCUSSION

The PUEM constitutes a proposal for a pedagogical model for the training of high-level specialists in aesthetic and reconstructive plastic surgery in various fields of the specialty, regarding the capacities, competencies, and complex skills required for the best performance of their professional duties. This necessarily involves specifying various attributes required in the personnel participating in the educational process and establishing qualitative criteria regarding the general characteristics of infrastructure and teaching-assistance organization that the university course sites must meet.[7]

Given that such criteria are considered essential to ensure the best development and success of study programs, it is accepted that these general provisions cannot be subject to substantial modifications and must be preserved regardless of the medical field in question.

The PUEM comprises specialization courses of up to 5 years, during which the student must dedicate 40 hours per week to carry out the academic activities that comprise it. In turn, the preparation of these activities requires a minimum of 15 hours per week of individual study.[8]

In Mexico, the duration of the aesthetic and reconstructive plastic surgery course is four years, and it is required to accredit at least two years of specialization in general surgery. The specialization must meet certain requirements: an integrated service within a second or third-level general hospital, with a division, subdirection, or analogous structure responsible for teaching and research, in coordination with the postgraduate studies division of the faculty of medicine of the UNAM.

The plastic and reconstructive surgery service where the course is carried out must have sufficient clinical material to allow the student to gain experience in the different thematic contents of the present academic program. This clinical material must be as varied and extensive as to provide the knowledge and skills to meet at least 75% of the postgraduate program.

An outpatient clinic must attend to a minimum of 100 new patients annually for each training student, in addition to subsequent consultation patients.

Facilities with adequately equipped operating rooms in furniture and instrumentation are required to perform the number of surgeries required by the service, and they must also have the support of a group of anesthesiologists.

A minimum of 150 surgeries per year must be performed for each student in training, according to their annual academic program.[8]

The aesthetic and reconstructive plastic surgery service must have an organization that allows the student the opportunity to evaluate and discuss cases of patients who come to the outpatient clinic with the medical specialists responsible for their teaching.

The service must have a planned surgery program so that the student not only acts as an assistant but also actively participates as a surgeon, guided by the plastic surgeons of the service who act as instructors, within a progressive and staggered learning method according to their ability.

Comparing the preparation and training in Mexico with other regions, plastic surgery training in Europe differs significantly. In the year 2019-2020, national delegates from 30 countries, including the 27 countries of the European Union, Norway, Switzerland, and the United Kingdom, were invited to complete a questionnaire on plastic surgery training, which covered demographics, curricula, theoretical courses, and examinations.[9]

Fifteen countries have a centralized training organization, which may be coordinated by the government, a medical chamber, or an independent council. In most countries with a decentralized organization, training is organized by university hospitals. A decentralized organization may impose inequality among learners from different training centers, and good cooperation between training centers should avoid differences in candidate selection, the scope of the training plan, and career opportunities. Each training center covers a population large enough to allow for an adequate number of procedures and a variety of pathology. Learners have the ability to actively participate in all fields to maximize their progress, with the average number of learners per 100,000 inhabitants being 0.4 (range: 0.1–0.7).[10]

Particularly in Europe, training in private practices is allowed in ten countries. Private practices are useful for providing training in aesthetic surgery. 53.7% of learners feel inadequately trained in aesthetic surgery, and the

average learner in the United Kingdom can only train in body contouring and breast surgery, but not in other areas of aesthetic surgery.[11,12]

As part of the rapid growth of the specialty, each learner must have the opportunity to be trained in a timely and comprehensive manner in aesthetic surgery to be able to face the day-to-day of private practice.

Nineteen countries (95%) have surgical training with an average duration of 22 months (range: 12-30). Specialized training in plastic surgery has an average duration of 49 months (range: 30-72). Six countries (30%) have a rotation system. Training in the Czech Republic includes two months of burns and two months of hand surgery. In Bulgaria, Italy, the Netherlands, Poland, Slovenia, and the United Kingdom, learners are also subject to strict rotations.[9,13] In Mexico, there is the peculiarity of external rotations according to the needs of the resident; however, these should not exceed 25% of the academic program according to the PUEM.

As for Iberolatin America, there are no studies in the medical literature that analyze training programs in the region; however, in 2020, a cross-sectional study was conducted on plastic surgeons considered leaders in this area. It was identified that some countries do not require any training in general surgery to be admitted to plastic surgery programs; countries like Portugal and Peru offer training in general surgery during the first year of residency. The average age at admission to training programs is 27.9 years (range 25 to 32 years).[14]

Four countries in the region (Bolivia, Panama, Guatemala, and Puerto Rico) do not offer any plastic surgery programs. Sixteen countries only have residency programs; Venezuela and Ecuador only have postgraduate programs, while Argentina, Brazil, and Cuba have both modalities. All postgraduate programs are honorary, so they generally require payment of tuition and fees by the postgraduate student. The average salary in residency programs is $880 USD (range $30 to $2400 USD).[15]

Plastic surgery programs range from two years in Chile to six years in Portugal; however, in most countries, the program lasts three years. The modality can be through a knowledge test, an interview, and letters of recommendation. Regarding content, most programs cover the most important fields of the specialty, such as aesthetic surgery, general plastic surgery, oncologic surgery, craniofacial, maxillofacial, congenital anomalies, microsurgery, hand surgery, and burn surgery. However, not all programs offer practical experience in each of these fields. In some countries, a minimum number of emergency procedures during training is required (range 200 to 315). The average weekly workload is 48 hours, and residents usually work a 24-hour shift in the emergency department.[16]

The country with the highest density of plastic surgeons is Argentina, with 4.4 per 100,000 inhabitants, followed by Uruguay (3.91) and Brazil (3.8). The countries with the lowest density of plastic surgeons are Guatemala and Honduras, with an average of 1.72 for the region. These figures are of great importance in determining the adequate number of plastic surgeons that a country needs and should train each year.[14]

In China, medical students complete 5 to 8 years of basic medical education. Before the healthcare reform, students would find employment in hospitals while simultaneously undergoing residency training in general surgery. However, after the healthcare reform, students are required to choose a government-led residency training program in general surgery lasting at least 3 years. Subsequently, they undergo 3 years of plastic surgery training, contingent upon passing the national technical and professional health qualification examination of their country. Otherwise, they continue as plastic surgery residents.[17,18]

This is significant because Mexico is among the top countries globally where the highest number of plastic surgeries are performed. According to data obtained from the International Society of Aesthetic Plastic Surgery (ISAPS), approximately 15 million surgical procedures and around 19 million non-surgical procedures were performed worldwide in 2022, totaling almost 34 million procedures. Mexico ranks fourth with 938,000 surgical procedures and 755,000 non-surgical procedures, totaling 1,693,325 procedures.

Both surgical and non-surgical procedures showed increases since the last survey (16.7% and 7.2% respectively), with a significant 57.8% increase in non-surgical procedures over the past four years. Liposuction was the most common surgical procedure in 2022, as in 2021, with over 2.3 million procedures and a 21.1% increase. The top five surgical procedures were liposuction, breast augmentation, eyelid surgery, abdominoplasty, and breast lift, which replaced rhinoplasty among the top five. The most popular non-surgical procedures are botulinum toxin, hyaluronic acid, hair removal, chemical peel, and non-surgical fat reduction. Chemical peel enters the top five, replacing non-surgical skin tightening.[19]

The results shown in our study are an important reflection of the data presented by ISAPS, demonstrating that aesthetic and reconstructive plastic surgery residents at a hospital in Mexico City are trained during their final year of residency to perform the most common and demanded aesthetic interventions worldwide, such as body contouring surgery, breast surgery, rhinoplasty, facelift, among others. However, it is difficult to ascertain whether each resident meets the quota of procedures performed during their training according to the academic program established by the corresponding university that accredits their title. This is due to limitations such as the involvement of only one institution (school) training

plastic surgeons, which may introduce a potential bias due to the absence of participation from other schools, as well as the lack of documentation of procedures performed by each resident or the omission of records due to incorrect diagnoses. This situation necessitates closer monitoring of the training undergone by plastic surgery residents, aiming to meet the established procedure goals, with a possible modification in the number of procedures, and attempting to establish a set number of surgeries to be performed in each area of aesthetic surgery to focus the knowledge and preparation of each resident in training.

CONCLUSION

In this review study, it is concluded that residents in the final year of aesthetic and reconstructive plastic surgery undergo training aligned with the academic program established by the PUEM, performing the most common aesthetic procedures in Mexico and worldwide according to the diagnoses presented here for each resident. However, we believe there is a bias regarding the quantity of procedures performed by each resident. Therefore, we advocate for the conduct of a multicenter study with greater methodological rigor to demonstrate the effectiveness of the implemented curriculum, meeting the established goal. This would ensure that final-year residents are capable of facing their professional lives with confidence.

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REFERENCES

1. Helliwe L, Riesel JN. Education and teaching in plastic surgery. Neligan PC, editor. Plastic Surgery. Fifth Edition. Philadelphia: Elsevier. 2024.
2. Taylor DCM, Hamdy H. Adult learning theories: implications for learning and teaching in medical education: AMEE Guide No. 83. Med Teacher. 2013;35(11).
3. Adams NE. Bloom's taxonomy of cognitive learning objectives. J Med Libr Assoc. 2015;103(3):152-3.
4. Ten Cate O, Carraccio C, Damodaran A. Entrustment decision making extending Miller's pyramid. Acad Med. 2021;96(2):199-204.
5. Sadideen H, Plonczak A, Saadeddin M, Kneebone R. How educational theory can inform the training and practice of plastic surgeons. Plast Reconstr Surg Glob Open. 2018;6(12):e2042.
6. Accreditation Council for Graduate Medical Education (ACGME). ACGME program requirements for graduate medical education in plastic surgery (integrated and independent). 2021. Available at: https://www.acgme.org/globalassets/pfassets/programrequirements/360-362_plasticsurgery_2021.pdf. Accessed on 12 March 2024.
7. Cuello Garcia CA, Perez Gaxiola G. Medicina basada en la evidencia. Fundamentos y su enseñanza en el contexto clinico. 2da ed. Mexico: medica panamericana. 2019.
8. Plan Unico de Especializaciones medicas en Cirugia Plastica y Reconstructiva. Ciudad de Mexico. 2020. Available at: http://www.sidep.fmposgrado.unam.mx:8080/NoBorrar/recursos/programas/cirplastica.pdf. Accessed on 12 March 2024.
9. Vissers G, Kisyova R, McArthur GJ, Atkins J, Thiessen F. Plastic Surgery training in Europe. J Plast Reconstr Aesthet Surg. 2022;75(5):1765-79.
10. Vissers G, Tondu T, Thiessen F. Didactic principles in plastic surgery training. J Plast Reconstr Aesthet Surg. 2021;74(10):2776-820.
11. Hashmi A, Khan FA, Herman F, Narasimhan N, Khan S, Kubiak C, et al. A survey of current state of training of plastic surgery residents. BMC Res Notes. 2017;10:234.
12. Pantelides NM, Highton L, Lamb A, Foden P, Winterton RIS. An analysis of the cosmetic surgery experience acquired through UK plastic surgery training. J Plast Reconstr Aesthet Surg. 2018;71:1532-8.
13. Vissers G, Vermeersch N, Thiessen F, Tondu T, McArthur GJ, Atkins J. An analysis of plastic surgery training: belgium and the United Kingdom. JPRAS Open. 2021;30:44-6.
14. Mayer H, Jacobo O, Grattarola G. Plastic surgery training in ibero-latin America: A cross-sectional survey study. J Plast Reconstr Aesthet Surg. 2021;74(7):1633-701.
15. Mayer HF, de Belaustegui EA, Loustau HD. Current status and trends of breast reconstruction in Argentina. J Plast Reconstr Aesthet Surg. 2018;71:607-9.
16. Sterodimas A, Boriani F, Bogetti P, Radwanski HN, Bruschi S, Pitanguy I. Junior plastic surgeon's confidence in aesthetic surgery practice: a comparison of two didactic systems. J Plast Reconstr Aesthet Surg. 2010;63:1335-7.
17. An Y, Liu J, Zhao J, Li D. Differences in Plastic Surgery Training Programs in China and the United States: Similarities, Pitfalls, and Opportunities. Ann Plast Surg. 2021;86(3S Suppl 2):S348-51.
18. Zheng J, Zhang B, Yin Y, Fang T, Wei N, Lineaweaver WC, et al. Comparison of Plastic Surgery Residency Training in United States and China. Ann Plast Surg. 2015;75(6):672-8.
19. International Society of Aesthetic Plastic Surgery (ISAPS). Aesthetic/Cosmetic Procedures performed in 2022. Available at: www.isaps.org. Accessed on 12 March 2024.

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