

Article

Impact of plastic surgery medical training on medical students' knowledge, attitudes, preferences, and perceived benefits: Comparative study

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Abstract

Introduction: Misconceptions surrounding the discipline of plastic surgery are widespread public and medical students and professionals, as well. The purpose of this study was to explore how the inclusion of plastic surgery rotation into the medical curriculum affects medical students' knowledge, attitudes, and preferences regarding plastic surgery specialization and referral.

Design and Methods: A descriptive-correlational design was utilized to collect data from 200 medical students in the final two years of education from two separate six-year medical programs in Jordan. Data was collected using self-reported questionnaires regarding knowledge of surgical procedures allocation, attitude towards plastic surgery, preference of specialization, and benefits of plastic surgery to physicians and patients.

Results: Analysis showed that medical students of plastic surgery integrate rotation (program A) had a higher average score of correct procedure-allocation (M=12.57, SD = 3.14), compared to non-integrated plastic surgery rotation program (program B) (M=8.29, SD=3.05). About 83% (n =83) of students in program A had their knowledge on plastic surgery from direct exposure to a plastic surgeon, compared to 43% (n=43) of program B, and 24% (n=24) of students in program A reported that their perception of plastic surgery influenced by media compared to 62% (n=62) of those in program B.

Conclusions: Medical students exposed to plastic surgery education are more confident about procedures of plastic surgery and had more reliable sources of knowledge about plastic surgery than those who were not exposed to plastic surgery rotation.

Introduction

Plastic surgery is an expanding specialty with procedures which incorporate reconstructive surgery, cosmetic procedures, orthopedics, and oncology.¹ The global misconception of plastic surgery education was not limited to professionals in the field; rather, for medical students. This was evident by the fact that misconceptions about the discipline of plastic surgery were not only confined to the public,² but also among medical professionals and students.^{3,4} Plastic surgery is mainly presented in mainstream media as synonymous with cosmetic or aesthetic surgery. This leads to major misconception regarding the practice of plastic surgery and influences the attitudes of medical students who are not exposed to plastic surgery in their rotations.^{4,5} Thus, certain medical schools have countered this misconception by incorporating plastic surgery education into the medical curriculum.^{6,7}

Medical education in Jordan has been established at Program A at the first and largest leading university in Jordan. Program A offers the "Doctor of Medicine" curriculum that is a six-year undergraduate degree. All other established schools of medicine have used the curriculum of Program A and proposed some minor modifications that correspond with the Ministry of Higher Education (MOHE) guidelines causing very minimal differences such as the plastic surgery rotation at the fifth year. The core courses are the same, while differences made in the elective university courses. This has caused minor difference in the number of credit hours of the two programs where Program A has 256 credit hours while the total credit hours at Program B is 257. Both universities follow the same path of education and clinical training throughout the six years. In addition, program B was originally established by the same management and medical team of

Significance for public health

Plastic surgery procedures contribute to large proportion of the worldwide surgical disease burden. Appropriate and timely intervention using plastic surgery has significant impact on multiple medical conditions and reduce cost of complications. Plastic surgery interventions acknowledged as low cost to resolve disabling conditions. However, misconception about plastic surgery may contribute in delayed referral and untimely and inappropriate intervention that may cause further burden to individuals; medically and economically. Comparing between medical programs that include plastic rotation and those who are not will increase the public health awareness, and in particular among medical staff, regarding benefits and needs of plastic surgery interventions to health of individuals. Major medical conditions such as deformities and disabilities can be resolved with timely plastic surgery interventions that improves health of people and lowering medical cost and burden of diseases.

Program A with minimal changes allowed to be done to the curriculum every four years, as required by the MOHE. This adds to the value of the study and significant exploration of the effect of enrollment in plastic surgery rotation on medical students. During the early years of the program, the basic medical and behavioral sciences (anatomy, biochemistry, genetics, immunology, microbiology, pathology, pharmacology, physiology, psychology and sociology) are taught by expert faculty members. The fourth year is commenced with an introductory course, which demonstrates the basic clinical skills that medical students need during their clinical rotations. The fifth year is largely taken up with core clinical rotations, as well as, sub-specialties such as plastic surgery (10 out of 80 lectures of general surgeries are on plastic surgeries in addition to two-week clinical rotation), emergency medicine, dermatology, family medicine and psychological medicine. The sixth year of the course has been structured as a series of advanced clinical rotations in the core clinical subjects, including medicine, surgery, pediatrics, and gynecology, as well as an 8-week elective rotation.

Nevertheless, the inclusion of plastic surgery in medical school curricula is still a controversial discussion, globally. The literature showed that plastic surgery is underrepresented in many medical school curricula.⁸ Those who supported inclusion of plastic surgery in medical programs asserted that such integration will improve the referral pattern among health care providers due to existence of cross-over procedures between plastic surgery and other specialties such as orthopedic surgery, otolaryngology, dermatology, maxillofacial surgery and more.¹ Moreover, exposing undergraduate medical students to plastic surgery may influence the likelihood of medical students choosing plastic surgery as a future specialty.⁹ A survey showed that 30% of plastic surgery trainees decided on their specialty while they still in medical school.¹⁰ Therefore, perception of plastic surgery among medical students might be crucial for them to make an informed decision to choose plastic surgery as their future career. Moreover, studies have also found that most medical professionals, educators, and students believed that less exposure to plastic surgery training in medical school decreases the competency as future surgeons, physicians, and general practitioners in a clinical sense.^{5,11} The available information, and the aforementioned positive influences, increases the legitimate need of the plastic surgery rotation for medical students. However, less is known about how differences in medical education and training affect medical students. Medical students enrolled at different programs are under the same rules of medical practices and specialization. Therefore, preferences of specialization of medical students, and later executing medical decisions, referrals options could possibly be influenced by type of medical curriculum they were exposed to. Less is known about this issue; and therefore, this study aims to explore how such differences would influence medical students' perception of benefits of plastic surgery training and, eventually, their practices.

Purpose of the study

In this study, we emphasize the importance of integrating plastic surgery training into the medical curriculum. Medical students' knowledge about plastic surgery, procedures performed by plastic surgeons, and the inclusion of plastic surgery in the curriculum may influence the likelihood of choosing plastic surgery as a future specialization. Therefore, the purpose of this study was to explore how the inclusion of plastic surgery rotation into the medical curriculum affects medical students' knowledge, attitudes and preferences regarding plastic surgery specialization and referral.

Design and Methods

A cross-sectional, descriptive-correlational design was used to compare data collected from two groups of medical students at two medical programs in Jordan. Data was collected using a self-reported questionnaire with items regarding knowledge of surgical procedures and procedure-specialty allocation, attitudes towards plastic surgery, preference of specialization, and benefits of plastic surgery to physicians and patients.

Sample and settings

A total of 250 students approach from the two universities (125 from each program). Based on the calculated sample size using Gpower 3.1.7 software [12] comparing differences in means with medium effect size of 0.4, $\alpha=0.05$, a power=0.80 a total sample of 200 (100 per groups) was needed. Considering approval rate the total sample increased to 250 (125) to ensure reaching the desired sample size. A total of 200 students met the eligibility and filled and returned the survey. The students at program A had undergone plastic surgery education and rotation, while those at program B had not. Those in program A are attending 10 out of 80 lectures of general surgeries in topics related to plastic surgeries in addition to two-week clinical rotation at inpatient, outpatient and surgical intervention settings at the hospital. The inclusion criteria consisted of medical students who have finished their fourth year and enrolled in the 5th year at medical school to ensure that students did have plastic surgery rotation as part of their clinical training and are actively enrolled in either program. Exclusion criteria includes those who are temporary students across universities as they wouldn't be exposed to the whole program and might have other course at other programs.

Data collection procedure

Before initiating data collection, ethical approval from the Internal Review Board was obtained. Research team approached students through facilitators at each of the universities. The role of the facilitators was to approach students and invite them to participate in the study. Those who expressed interest were approached by the research team who were available to explain the significance and purpose of the study. The researchers assured students of the confidentiality and anonymity of the study in which students are not required to identify their names or contact information and that an identified code has been established for each survey indicating the name of the program connected to code book to identify the type of the program for analysis purposes. Researchers also assured students about their voluntary participation and that they have the right to participate or refuse to participate without any direct or indirect effect on their status as students. The method of filling in the questionnaire was also explained in detail. The participants were given 15 minutes to fill in the questionnaire. The package was presented in the English language acknowledging that the instruction language at both medical schools is English and the students are at least in their fifth year indicating fluency, and the language used in the questionnaire was simple medical language that fits with their usual daily language practices. The researchers were available to collect the questionnaires from students at their convenience. Data was kept safe at locked cabinet at the principal investigator's personal office, and electronic format saved at password-secured computer of PI.

Measurement

The questionnaires were developed based on the review of literature utilizing various resources to measure the variables of the

study.^{2,5,7,11-14} The reviewed information was concerned mainly of procedures of plastic surgery, preference of medical specialty, attitudes, sources of information, benefits or plastic surgery education. Data from previous studies and international guidelines, description and information related to specialty of plastic surgery. The information for this study was reviewed by a team with expertise in plastic surgery. The methodologist of the study used the guidelines proposed for adapting or adopting an instrument (<http://korbedpsych.com>) to develop the tools of the study. Then, the researchers organized the information into four main parts. Pilot testing was conducted using medical students (n=10) requesting their appraisals for the culture and language appropriateness of the tools, clarity, time required, and understandability. Minor linguistic changes were made based on their report. The survey is formed of four parts:

Part 1: Consists of 18 scaled items of different clinical procedures or scenarios. In addition, the students were given a list of 10 medical specialties and were asked to correlate each given procedure or scenario to the medical specialty they believe is most experienced and suitable to deal with (see appendix 1). They need to match the given medical procedures to the appropriate medical specialty. This will allow exploring student's knowledge about the procedures that are performed by the plastic surgeons. The scale showed internal consistency with a Cronbach's alpha of .78.

Part 2: 24 scaled items regarding attitudes toward plastic surgery. The students are requested to make their answers on a Likert scale from strongly disagree (1) to strongly agree (5). Students are asked to rate their response on the scale showing their perspective towards each statement (see Appendix 1). The higher the score the more positive attitudes toward plastic surgery. In this study, the scale showed good internal consistency with Cronbach's alpha of .82.

Part 3: 13 scaled items regarding the likelihood of specialization in plastic surgery. The students are requested to make their answers on a dichotomous scale whether yes (1) or no (0). The higher the score the more preference of specialization and favor of plastic surgery. The question is addressing factors contribute to their preference decision. For example, "Do you plan to choose plastic surgery for your future specialization?" "I found plastic surgery boring and not interesting". In this study, the scale showed good internal consistency with Cronbach's alpha of 0.72.

Part 4: 10 scaled items to measure the benefits of plastic surgery. Five questions were about benefits to physicians and five questions regarding benefits to the patient (see appendix 1). The students are requested to make their answers on a Likert scale from strongly disagree (1) to strongly agree (5). This would allow understanding how students experience whether took the plastic surgery rotation or not assumes the benefits and allow making comparisons

Table 1. Descriptive characteristics of students (n=200).

Variable	n	%	
Sex	Male	93	46.5
	Female	107	53.5
University	A	100	50.0
	B	100	50.0
Academic Year	5 th	100	50.0
	6 th	100	50.0
Place of residence	City	175	87.5
	Suburbs	13	6.5
	Village	12	6.0
Does your father work in the health field?	Yes	42	21.0
	No	158	79.0
Does your mother work in the health field?	Yes	21	10.5
	No	179	89.5
Does your brother work in the health field?	Yes	8	4.0
	No	192	96.0
Does your sister work in the health field?	Yes	8	4.0
	No	192	96.0
Acceptance into university	Competitive	62	31.0
	Scholarship	39	19.5
	Parallel	64	32.0
	International	35	17.5
Who pays your university fees	Parent/s	134	67.0
	Scholarship	23	11.5
	Welfare	39	19.5
	Charity	0	0.0
	Relatives	3	1.5
	Self-funded	1	0.5
Family income from your point of view	High	26	13.0
	Medium	168	84.0
	Low	6	3.0
Have you or any family member undergone a plastic surgery	Yes	13	6.5
	No	187	93.5
Have you had a training course in plastic surgery	Yes	2	1.0
	No	198	99.0

between the two programs. For example, “ Knowledge about plastic surgery will enable better treatment options for surgical problems” “ Plastic surgery will improve physical Health of patients.” The higher the score the more benefits are the plastic surgery to the identified person. In this study, the scale showed good internal consistency with Cronbach’s alpha of .79.

Demographic information

In addition, the survey included background information regarding students’ personal details including age, sex, details about their academic level, socio-economic level, GPA, family information regarding plastic surgery, family and personal history of plastic surgery.

Data analysis plans

The computer program, SPSS-IBM Windows (version 24.0) used to describe the variable of the study using the central tendency measures (means, and medians) and the dispersion measures

(standard deviation and ranges). The estimated descriptive statistics compared to normative samples in the literature. t-test has been used to test differences in the variables of the study in relation to continuous demographic characteristics, and chi-square used to examine the difference in demographic characteristics of the subjects related to the variables of the study for the categorical level of measurement. Pearson correlation (r) was used to test the association among the coniferous variables. Data set to two tailed 0.05 level of significance.

Results

Descriptive characteristics

A total of 200 students filled out the survey out of 250 surveys distributed with a response rate of 80%. The mean age was 23.1 (± 0.96) years, with 46.5% ($n=93$) being male and 53.5% ($n=107$) being female. The average GPA was 3.16 (± 0.45) (Table 1)

Table 2. Description of responses of program A and regarding procedure-specialty allocation (n=200).

Items		Program			
		A		B	
		n	%	n	%
Bedsore in patients after spinal cord injuries	Incorrect	41	41.0	95	95.0
	Correct	59	59.0	5	5.0
Total hip replacement	Incorrect	2	2.0	9	9.0
	Correct	98	98.0	91	91.0
Breast reconstruction following mastectomy	Incorrect	11	11.0	29	29.0
	Correct	89	89.0	71	71.0
Rhinoplasty	Incorrect	84	84.0	79	79.0
	Correct	16	16.0	21	21.0
Full-thickness abdominal burn	Incorrect	11	11.0	41	41.0
	Correct	89	89.0	59	59.0
Appendectomy	Incorrect	3	3.0	10	10.0
	Correct	97	97.0	90	90.0
Abdominoplasty	Incorrect	35	35.0	36	36.0
	Correct	65	65.0	64	64.0
Breast reduction	Incorrect	19	19.0	43	43.0
	Correct	81	81.0	57	57.0
Cleft palate repair	Incorrect	36	36.0	78	78.0
	Correct	64	64.0	22	22.0
Liposuction	Incorrect	38	38.0	45	45.0
	Correct	62	62.0	55	55.0
Ear laceration	Incorrect	52	52.0	87	87.0
	Correct	48	48.0	13	13.0
Breast augmentation	Incorrect	18	18.0	31	31.0
	Correct	82	82.0	69	69.0
Lower leg skin graft	Incorrect	10	10.0	38	38.0
	Correct	90	90.0	62	62.0
Skin cancers of the face	Incorrect	31	31.0	78	78.0
	Correct	69	69.0	22	22.0
Management of amputated digits	Incorrect	60	60.0	83	83.0
	Correct	40	40.0	17	17.0
Facelift	Incorrect	31	31.0	51	51.0
	Correct	69	69.0	49	49.0
Acutely ischemic foot	Incorrect	25	25.0	54	54.0
	Correct	75	75.0	46	46.0
Correction of prominent ears	Incorrect	36	36.0	84	84.0
	Correct	64	64.0	16	16.0

Knowledge of medical procedures

The analysis (Table 2) showed that the mean score for procedure-specialty allocation for program A (those who received plastic surgery education) was 12.57 (± 3.14), and for program B it was 8.29 (± 3.05). Comparing the two programs, the mean difference in mean scores at program A and B was statistically significant ($p=0.021$) with a mean difference of 4.28 (95% CI: 3.42 to 5.14). The analysis infers that students in program A had higher level of accuracy to identify procedures of plastic surgery than those in program B. Moreover, a significant positive correlation between GPA and procedure-specialty allocation was found ($r=0.30$, $p=0.007$), inferring that students with higher GPA are more likely to identify the medical procedures appropriate to specialties indicating higher level of knowledge. While, using chi-square, no significant differences were found regarding knowledge of medical procedure related to gender, academic year, and age ($p>0.05$). The item analysis showed that the most reported incorrect answers for program A were Rhinoplasty (84%), management of amputated digits (60%), and ear laceration (52%). While, bedsores in patients after spinal cord injuries (95%), total hip replacement (91%), and ear laceration (87%) were the most reported wrong answers by students in Program B. The analysis infers that there is a huge difference between the two programs in terms of procedure-specialty allocation.

Benefits of plastic surgery

The mean score for benefits of plastic surgery among students in program A was 40.83 (± 7.19), and for program B was 36.49 (± 6.14). Comparing the two programs, the mean difference in mean scores at program A and B was statistically significant ($p=0.006$) with a mean difference of 4.34 (95% CI: 2.48 to 6.20). Regarding students' perspectives on plastic surgery, over 80% of students from both programs believed that there aren't enough plastic surgeons. As for the students who did undergo a plastic surgery rotation (program A), 69% stated that they enjoyed the rotation. When asked about considering plastic surgery as a future career, 19% of students in program A compared to 30% of those in program B did choose plastic surgery. When asked about reasons that they would not consider a future career in plastic surgery, 24% of students in Program B stated that they expect plastic surgery to be boring and uninteresting, compared to 9% in Program A. The most frequent answer (40%) among students in program A was that "plastic surgery to be demanding". The most frequent one (31%) among students in program B was that they expect plastic surgery to be delicate and risky.

On the other hand, when asking students about the sources of information and where they obtain their knowledge on plastic surgery, 83% of students in program A reported that their main sources was plastic surgeons during their rotations compared to 43% of students in program B. Interestingly, 62% students in program B reported that their sources of knowledge and information

Table 3. Attitudes towards plastic surgery (n=200).

Item	SDA		DA		N		AG		SAG	
	A %	B %	A %	B %	A %	B %	A %	B %	A %	B %
1. Plastic surgery and cosmetic surgery are the same	38	17	46	39	11	20	5	20	0	4
2. Plastic surgery is a complementary type of treatment	38	8	32	35	16	18	8	30	6	9
3. Plastic surgery is favored for celebrities and rich	31	14	24	19	15	25	20	30	10	12
4. Plastic surgery is recommended for those with physical abnormalities.	3	3	14	14	14	31	50	36	19	16
5. People use plastic surgery for luxurious purposes	15	5	15	25	26	32	34	32	10	6
6. Plastic surgery is limited to specific parts of body	37	14	37	40	17	25	7	16	2	5
7. Plastic surgery accepted socially	1	2	19	24	39	37	37	31	4	6
8. Plastic surgery requires special training and specialization	0	1	3	3	0	9	25	37	72	50
9. Plastic surgery is one sub-specialty of surgical specialties	5	2	5	13	3	13	41	45	46	27
10. Performing cosmetic surgery cause shame and shyness	27	28	31	32	27	26	15	11	0	3
11. Performing plastic surgery cause shame and shyness	38	25	36	40	16	19	8	13	2	3
12. Women seeking cosmetic surgery more often than men	1	1	2	5	18	25	60	42	19	27
13. Younger population are increasingly accepting cosmetic procedure	0	3	6	10	13	23	61	49	20	15
14. Cosmetic surgery is a waste of money	18	15	38	28	25	35	15	16	4	6
15. Those who undergo cosmetic surgery do it to look better	4	2	8	11	31	33	49	47	8	7
16. Plastic surgery is more about beauty	21	4	41	26	21	33	15	33	2	4
17. Plastic surgery is for people who want to improve their physical appearance	8	2	24	15	31	35	33	39	4	9
18. Media portrayals play a significant role in making decision to undergo plastic surgery	0	0	6	10	28	33	46	43	20	14
19. I support those who want to do a plastic surgery	2	3	6	10	29	37	40	38	23	12
20. If I had cosmetic surgery, I would be eager to tell people	12	6	26	20	43	50	12	22	7	2
21. In the future, I might have cosmetic surgery	19	15	31	21	25	34	14	25	11	5
22. Cosmetic surgery can be a big benefit to a person's self-image.	2	4	6	9	19	26	51	48	22	13
23. I do follow plastic surgery TV shows and magazines	39	18	24	21	17	30	15	25	5	6
24. I would never have any kind of plastic surgery	25	10	17	19	33	48	17	19	8	4

SDA, strongly disagree; DA

about plastic surgery was from the media/television compared to 24% in Program A.

Regarding attitudes and preferences of plastic surgery, students in program B were more likely to agree that plastic surgery is synonymous with cosmetic surgery, unnecessary or 'complementary' treatment, and that it is limited to celebrities and the wealthy people, compared to students in program A who had much less agreements (Table 3). In addition, 20% of students in program A followed plastic surgery in the media, compared to 31% of those in Program B.

Discussion

Plastic surgery has been misperceived in the literature and media. More alarmingly, however, plastic surgery has also been misperceived by medical students⁴ inferring that the specialization and related procedures are not well addressed in the medical curricula and medical care plans. Therefore, this study compared the differences between medical students enrolled in a medical program that integrates plastic rotation in practicum (program A) and medical students in a program that does not (program B). The results of the study showed, in general, that medical students in program A have significant and remarkable positive knowledge, attitudes, and perceived benefits about plastic surgery and have better awareness about the short and long-term benefits of plastics surgery. The results also did find that students in program B have a better understanding of the knowledge and referral plans once identified.

Students in program A were also more capable to identify procedures per specialty inferring that their knowledge about plastic surgery and its related procedures did enable them to have better medical awareness and a higher level of accuracy of referral when needed. For example, students in program A were more likely to associate both reconstructive procedures (such as bedsores, skin grafts, breast reconstruction post-mastectomy, full-thickness burns) and cosmetic procedures (such as liposuction, rhinoplasty, facelift, and breast augmentation) with plastic surgery, as opposed to group B who incorrectly associated them with other specialties. This was comparable to the results found by Farid *et al.*,¹³ who found that certain procedures were more likely to be associated with plastic surgery when it is included in the curriculum.

Regarding the students' perspectives towards considering plastic surgery as a future career, students in program B have higher tendency to choose plastic surgery as a future career than students in program A. Although this may seem unexpected; however, one explanation could be that students exposed to plastic surgery education and rotation in practicums were able to make well-informed decisions about plastic surgery away from misconceptions and media portrayals of plastics surgeons as living a luxurious lifestyle. This corresponds to several similar studies,^{5,13,14} that found that knowledge about plastic surgery among medical students not exposed to plastic education and training are largely come from media, compared to students of programs integrating plastic surgery as part of medical education who acquired their knowledge from immediate clinical experience and plastic surgeons. More clinical information and medical awareness could have influenced students in program A to make better decisions of future specialty.

On the other hand, students in program B probably had an arbitrary selection of the plastic surgery as their future career depending largely on their misconceptions influenced by their lack of information.

Furthermore, lack of studies that measure the differences before and after exposure to plastic surgery education and training are lacking. Such a research approach would allow better understanding and control and effect of other sources of information that affect medical students' decision, knowledge and preferences. The classroom and instructional style of tutors and medical educators do play significant role to inform students about different specialties in medicine. In the Arabian culture, studying medicine is the most preferred specialty for all students, and those enrolled in this specially represent the top 10% of all students at the high school achievement score. This would indicate that students at schools of medicine have high academic and education skills and motivation, and chose to study medicine acknowledging their future career line.

One question asked whether the students believed that plastic surgery and cosmetic surgery were the same. Only five percent of the students in group A held this belief, while 24% of the students in group B did. The students were also asked whether they believed plastic surgery was a complementary type of treatment, as opposed to a necessary specialty. Of the students in group A, 39% of them either agreed or strongly agreed with this statement. Only 14% of the students in group B agreed with this statement. These answers can be explained by the representation of plastic surgery in the media and the lack of proper plastic surgery education even for students in group A although much higher effect was observed on students in group B.

One limitation of this study it that information of this study depended largely on cross sectional approach. A longitudinal one following up medical students after graduation and being more involved in medical clinical practices and specialization would reveal more information conclusions.

Conclusion

This study found that medical students who had a plastic surgery rotation had better knowledge and a more positive attitude toward plastic surgery, than students who did not. The study signifies that the integration of plastic surgery into medical curriculum is essential, not only for increasing knowledge, rather for more accurate medical decision-making. This is evident by the higher level of accuracy in identifying medical procedures related to plastic surgery among the students who attended a plastic surgery rotation. The decisions made by medical students, as future physicians, my influence the cost of medical care and compromise the patient's health, if not appropriate and accurate. The misconception about plastic surgery was greater among students who relied on the media and not on the medical curricula to obtain their knowledge and information. If the misconceptions amongst medical students regarding plastic surgery are preemptively combatted, then this will allow for a better understanding of plastic surgery procedures, improved referral patterns, and subsequently increased patient satisfaction.

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