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When it is time to decide: factors associated to the choice of a medical specialty

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ABSTRACT

After finishing their initial education, physicians can enter post-graduate training programs. In Chile, there are multiple medical specialties options. This review synthesizes the factors associated with the choice of specialty, according to international publications. Students coming from rural areas or small towns would tend to choose Family Medicine. Men prefer specialties such as Surgery. Having relatives in the medical profession, specializing in a specific field, also influence the choice. Concerning interests and preferences, these are linked to personal traits and some biological variables. The inclination towards clinical or surgical fields could be predicted. Academically, the curriculum, good learning experiences and teacher models favor choice, while the harassment suffered could contribute to avoidance. Besides, both prestige and economic prospects are influential factors in the choice and specialties such as Surgery are preferred. The choice of specialty must reach a balance between the students' interests and public health needs. Identifying these factors would allow a better understanding of the present shortfall (or surplus) in certain fields and contribute to the definition of policies and decision-making.

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Key words: Education, Medical, Graduate; **Medicine;** Students, Medical.

Cuando es tiempo de decidir: factores asociados a la elección de especialidades médicas

Concluida su formación, los médicos pueden acceder a programas de formación de postgrado; en Chile existen múltiples opciones de especialización médica. Esta revisión narrativa busca sintetizar los diversos factores asociados con la elección de especialidad médica según la literatura internacional. Entre los resultados se observa que los alumnos provenientes de zonas rurales o ciudades pequeñas tenderían a elegir Medicina Familiar. Los hombres tendrían mayor predilección por especialidades como Cirugía. También influiría ser hijos de médicos especialistas en un área específica. En cuanto a los intereses y preferencias, éstas se conjugan con rasgos de personalidad y algunas variables biológicas, que podrían predecir la elección de especialidades hacia el tipo clínico o quirúrgico. En lo académico, el curriculum, una buena experiencia y modelos docentes fa-

vorecen la elección, mientras el maltrato sufrido podría contribuir al descarte. Además, tanto el prestigio como el potencial económico de ciertas especialidades ha sido un factor influyente en la elección: se prefieren especialidades como Cirugía. La elección de especialidad debería encontrar un equilibrio entre los intereses del estudiante y las necesidades de salud pública. Identificar todos estos factores, permitiría una mejor comprensión de la actual escasez o sobrecarga en determinados campos, y contribuiría en la construcción de políticas y toma de decisiones, con el fin de mejorar el reclutamiento de estudiantes.

Palabras clave: Educación de Postgrado en Medicina; Estudiantes de Medicina; Medicina.

Antecedents and role of specialization

It is usual for medical students attending social events, that even before they can get a bite to eat, someone asks: what are you going to specialize in?

Physicians' training is a process that lasts from 6 to 7 years in Chile. A further formation process can take place through a post-graduate program lasting 2 to 5 years, going on in hospitals and accredited health centers, to acquire a fund of specialized medical knowledge. Although this is the expression of an individual growth decision, the formation of specialists affects the country's development¹. This narrative review aims to identify what factors affect this choice.

In 2014 the Chilean Ministry of Health (MINSAL) showed a shortage of specialists in the public system, hitting about 1,500,000 users. From then on, the number of quotas and formation centers for new specialists has grown, and the number of grants supporting them. This also creates multiple medical specialty options, for physicians' dependent and not dependent from the MINSAL².

Different factors determine the choice of a medical specialty; these have been studied more closely since the nineties. This, because since then physicians choose primary care specialties less frequently (Pediatrics, Family Medicine or Internal Medicine), and this impacts on health systems and patients' care³. But even earlier and among the first studies, one carried out in the United States in 1960 addressed the relationship between physician's personality types and specialties, presenting the hypothesis that those traits induce the choice of the specialty to follow⁴. Since then, not only the influence of personality, but also the link with socio-demographic and academic factors, as

well as the work prospects of the students have been examined, and there are publications on this subject from various countries, such as Peru, Sweden or Japan.

There are diverse medical specialty options, in Chile the two major systems are: primary specialties and sub-specialties, specified in Table 1⁵.

Studies vary as to the timing of the student's assessment, but few survey the timing of the choice. Among the latter, a study carried out in the UK showed that half the students would make a final choice of specialty during their first year at the School of Medicine⁶. This differs from the evidence of a study carried out in Mexico, where the choice occurred during the final years of university formation. On the other hand, surgeons make a specialty choice earlier, even before entering the school of medicine⁷.

The choice of a medical specialty process is influenced by different factors, which are synthesized below in four groups (Figure 1).

Socio-demographic factors

The students' home location is one of the factors examined, whether they lived and studied in rural or urban areas before entering Medicine and, finding that in diverse countries, students coming from rural areas or smaller cities would opt for Family Medicine with greater frequency⁸. Other studies stated that there are no significant links between the location of origin and the choice of medical specialty⁹.

Gender differences are now studied more frequently due to the present feminization of Medicine; these are perceived in studies from different countries (Japan, Syria, and Mexico) where it was

Table 1. List of medical specialties programs accredited by the Association of Medical Schools of Chile (ASOFAMECH)

Primary specialties	Sub-specialties or specialties derived from the Primary
<ul style="list-style-type: none"> • Pathological Anatomy • Anesthesiology • General Surgery • Pediatric Surgery • Dermatology and Venereology • Clinical Genetics • Clinical Laboratory • Family Medicine • Physical Medicine & Rehabilitation • Internal Medicine • Forensic Medicine • Nuclear Medicine • Neurosurgery • Neurology • Pediatric Neurology • Obstetrics and Gynecology • Ophthalmology • Orthopedics and Traumatology • Otolaryngology • Pediatrics • Psychiatry • Child and Adolescents Psychiatry • Radiology • Oncologic Radiotherapy • Public Health • Urology 	<ul style="list-style-type: none"> • Derived from Anesthesiology: <ul style="list-style-type: none"> - Intensive Medicine • Derived from General Surgery: <ul style="list-style-type: none"> - Face, Neck and Maxillary Surgery - Thorax and Cardiovascular Surgery - Plastic and Repair Surgery - Peripheral Vascular Surgery - Coloproctology - Intensive Medicine • Derived from Internal Medicine: <ul style="list-style-type: none"> - Cardiology - Diabetology - Endocrinology - Respiratory diseases - Gastroenterology - Geriatrics - Hematology - Infectious diseases - Intensive Medicine - Nephrology - Medical Oncology - Rheumatology • Derived from Obstetrics and Gynecology: <ul style="list-style-type: none"> - Oncologic Gynecology - Maternal Fetal Medicine • Derived from Pediatrics: <ul style="list-style-type: none"> - Cardiology - Pediatric Endocrinology - Pediatric Respiratory Diseases - Pediatric Gastroenterology - Pediatric Hemato-Oncology - Pediatric Intensive Medicine - Pediatric Nephrology - Neonatology

found that choices varied depending on gender: men mostly prefer surgical specialties and women lead in specialties such as Obstetrics-Gynecology and Pediatrics^{7,9,10}. By contrast, a study carried out in Pakistan during 2017 showed that women tended to choose surgery and Internal Medicine over the Gynecology and Pediatrics specialties, thus reflecting a change in the pattern shown before in various works and pointing out the need to widen the study of gender as a choice predictor factor¹¹.

Research about differences in choice criteria found that, at the moment of choosing, the variety of medical problems and duration of the specialty, the type of work and experiences during the clinical internship were more relevant for women, while the possibility of doing research, pleasant academic experiences, having abilities related to the specialty, the possibility to obtain income more quickly, autonomy and the possibility of studying a sub-specialty are more important to men^{7,10}.

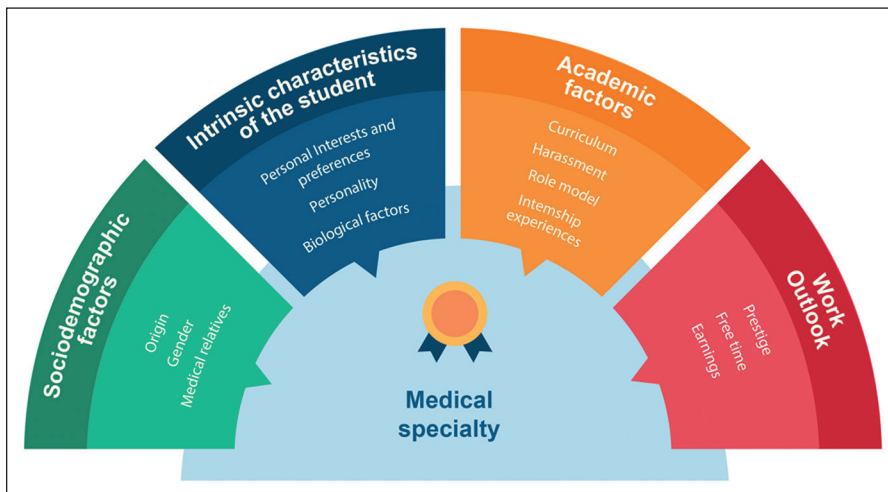


Figure 1. Classification of the factors associated to the choice of a medical specialty.

Research has described that women mostly choose specialties linked to managing chronic patients, palliative care, and a controlled lifestyle, with differences depending on the country of the and finding these factors less relevant in countries such as Sweden and the Netherlands³.

Another factor associated to the medical specialty choice is to have a medical relative or acquaintance engaged in a specific specialty. Brazilian researchers observed that the relatives' influence was significant only when the parents were physicians¹², excepting the preference for Family Medicine⁸. On the other hand, a Japanese study revealed that those students who opted for General Medicine, and Emergency Medicine had physician parents in a low percentage, and those with a physician parent and plans to open their clinic tended to choose internal medicine as a specialty in greater proportion⁹.

Intrinsic characteristics of the student

A meta-analysis found that the factors that students consider when choosing a specialty are their academic interests and competencies, this being more relevant in developed countries than in the developing world⁶. This can be appreciated in that students that consider General Surgery, Family Medicine, and Obstetrics-Gynecology as eventual specialty, state that having the required abilities for the specialty was generally a relevant factor⁷.

On the other hand, the personality, understood as affective characteristics, experiential and motivational of a person, reflected in values, attitudes, and coping strategies¹³. has been studied assessing its influence as a medical specialty choice predictor³. A Finnish study addressed the "Person-Job fit" theory, and postulated that personality traits would allow predicting how a person will adapt to a specific job or organization¹³.

Although the association with a certain type of personality has been described for each specialty, it cannot be said that these are determined a priori by a specific type, since physicians, like all people, can show complex personality traits patterns¹⁴.

Table 2 synthesizes the studies that address the relationship between personality and the chosen specialty.

In Peru, concrete thinking and stress traits predominate in medical students who prefer clinical specialties¹⁵. While in Mexico they were described as more patient, gentle, kind, with a general deeper emotional response. This study also expounded that a higher score in the modesty flexibility, perfectionism, emotivism, kindness, honesty and humility traits were predictors of this preference¹⁴.

Also, in Peru, traits of dominance and openness to change predominate in those who prefer surgical specialties¹⁵. In Mexico, they were described as less modest, more extrovert, more diligent, more organized, and in general less emotional, finding that higher scores in the field of extroversion and

Table 2. Relationship between personality traits and chosen specialty, according to literature

Specialty	Personality trait	País
Internal Medicine	Rigid, cold, sceptic, prefer to work with things rather than persons.	Mexico (3)
	High conscientiousness given their high self-confidence. Diligent, painstaking	Finland (13)
Gynecology-Obstetrics	More extrovert, with more sensitive thought and judgment.	Mexico (3)
Psychiatry	Higher responsibility levels and slightly high of extraversion, higher levels of openness to experience, neuroticism and agreeableness. Lower levels of conscientiousness.	Finland (13)
Pediatrics	Extroverts sensorial, with rational thought and qualifier judgment.	Mexico (3)
		Finland (13)
Surgery	Higher capability to adapt to change, extroverts and open. Low agreeableness level and neuroticism. Tending to be organized, careful and persistent.	Mexico (3)
		Finland (13)
Orthopedics	More traits of perfectionism and stress. Perfectionism	Mexico (3)
Otolaryngology	Higher openness to experience	Mexico (3)
	Less openness to experience	Finland (13)
Genetics	Higher openness to experience	Mexico (3)
Ophthalmology	Less openness to experience	Finland (13)

organizational traits predicted this preference¹⁴. They also showed lower levels of kindness¹³ and higher extroversion levels, which would be evident from the first year of their formation³. However, in Saudi Arabia, this same type of student showed high scores of “neuroticism-anxiety”, “searching for impulsive sensations”, “aggression-hostility”, and “sociability”¹⁶.

A study from Croatia showed that the students who reached higher scores in sympathy and openness (intellect/imagination) would lean towards psychiatry, and the more diligent students preferred anesthesiology, and emergency medicine¹⁷. In Peru, strong introversion was linked to specialties supporting diagnosis or administration¹⁵.

Some authors additionally suggest that there is a “biological predetermination” in those who seek a surgery career, this is supported by the findings of a study in medical students from the United States. The testosterone and cortisone levels were measured, as well as the ratio between the second and fourth finger (2D-4D) as an approximate measurement of the exposure to testosterone and estrogens in the uterus, and the data were associated to the preference for a surgery or non-surgery specialty. The group preferring surgery had a 2D-4D ratio significantly lower, higher scores in competitiveness and lower ones in anxiety, as well as a significantly higher testosterone delta

and a lower cortisol delta than the non-surgery preference group¹⁸.

Academic factors

Among academic factors, a Brazilian study pointed out two factors that favor the specialty choice: in the first place, the influence of a model teacher⁸. Yang states that the exposure to mentors in specific fields of medicine, such as internal medicine is strongly associated to the specialty chosen by the students⁶. Furthermore, even the stereotypes of specialties shown in television series or movies would have an influence at the time of deciding¹⁹.

The practical activities followed during internships are in second place⁸. A greater exposure of students to general practice, as well as a positive experience in a specialty, would influence following that course^{7,20}. This contrasts with Mexican findings, where exposing the students to academic experiences linked to primary care did not appear to modify the election rates⁷. On the other hand, the internships' sequences and the design of the study plan could influence the specialty choice³. Furthermore, early exposure to clinical practice would increase interest in some specialties, an improved competency in that field⁶.

Medical students' harassment experiences during formation are another factor. Up to 91% of the students have suffered some kind of harassment and revealed that this situation had affected their social life and the image they had of the physicians and their mental state²¹, even to the point of having doubts about their profession²². However, no data about the repercussion on the choice of specialty were found^{21,22}.

Work prospects

Yang revealed that income is an influential factor, especially in those countries where higher education has a heavy cost for students^{6,3}. Furthermore, having to pay the loans for the financing of the career orients the students to specialties that they perceive as being better sources of income, preferring surgery specialties^{3,16} and lowering the predilection for specialties such as Family Medicine⁶.

This agrees with a study carried out in Sweden, showing that medical specialties are perceived as having different status in the power field, Surgery being the predominant specialty²³. This fact has been supported by other studies, where it has been shown that medical students who prefer Surgery consider that the prestige of the specialties is of major importance at the time of deciding⁷.

The "social dominance" theory may explain the choice of a specialty with higher status in a specific social system, because persons prefer hierarchy and therefore prestige. Students with higher "social dominance" chose specialties with greater technical orientation and prestige (such as Surgery, Internal Medicine and Anesthesiology), this increases over time, as social dominance would be lower at the start of the clinical years. This effect seems to become stronger as the exposure to sub-specialties with greater prestige and hierarchy increases³.

It has also been noted that students who focus themselves on primary care specialties are less influenced by the perception of the prestige that they shall acquire, than those who center themselves in more prestigious specialties of other fields¹².

On the other hand, the type of patients is more important for those who prefer Internal Medicine, Pediatrics and Obstetrics-Gynecology, over Surgery and Family Medicine⁷. For Internal

Medicine, the motivation would be the possibilities to take part in terminal care, access to complex pathologies and clinical diagnosis reasoning. For Pediatrics, communication with the patients and social of the specialty seem important⁷; for Surgery and emergency medicine the treatment of acute pathologies is of interest⁹.

During the last few years, a change has taken place among medical students concerning the choice of specialties that offer greater control over lifestyle and working patterns³ although the availability of free time is limited in almost all specialties. It has been perceived that this factor is more significant for those who prefer Family Medicine and less relevant for those who want to follow Surgery⁷. Furthermore, the less flexible lifestyle of Surgery is an usual reason for the students to view this specialty as less appealing⁶.

On the other hand, students who want to develop new abilities, master advanced procedures and accede to innovative medical fields mostly prefer Surgery⁹ in contrast with those who prefer Obstetrics-Gynecology and Internal Medicine and consider the possibility of carrying out research within the specialty of lesser importance⁷. Regarding family relationships, those who prefer Family Medicine, their family's support and the wish to form a family are more relevant⁷.

Discussion

The choice of specialty should result from the balance between the interest of the professional and the needs of the citizens, as the distribution and imbalance of the specialties has a direct impact on health systems operations⁸.

The primary care specialties are seen as less prestigious, limiting their election. However, the evidence shows that the increase of physicians in this field, especially family doctors, improves the population's health, promotes equality in care, and reduces the health system's expenses, in contrast to the increase of specialists⁸. To eliminate such preconceptions would help the students pay attention to lesser demanded fields and increase interest in other specialties⁶.

Similarly, changes in health management could regulate the work overload in some specialties that are considered incompatible with personal life. These changes could open the door to people

who exclude themselves from these specialties and promote more healthy environments for those who work precisely in health care.

In this context, it is possible to propose a series of interventions such as personalized extracurricular training, as well as surgical or clinical internships, according to the students' preferences, added to the exposure to positive models among the schools of medicine teaching staffs, to favor decision-making in the future health professionals^{14,20}. If countries identify the factors that influence the students' specialty choosing, they can better understand the present shortage or surplus in specific fields. It also contributes to the construction of policies and decision-making to improve the students' future formation and recruitment (6), and helps them to generate appropriate incentives for future generations to choose specialties their communities need.

This added to changes in the process for entering into specialties to prevent situations in countries where choosing a specialty can be hindered for variables inherent to the selection process, such as the limited number of openings⁷.

In Chile, the choice of medical specialty has little updated evidence. In 2005 a study evaluated its relationship with personality with results similar to other Latin American studies²⁴. However, this is not the only factor that influences this choice.

Long lists of patients waiting for specialist care in the public sector are associated with dissatisfaction among the population. Chilean had a deficit of 3,795 specialists affecting 1,500,000 users in 2014²⁴. Although the Government developed national strategies to reduce this deficit², the extent of the problem makes it necessary to continue advancing in policies to increase the resources allocated to training specialists⁴. This, together with funding difficulties and legal problems related to the practice of the profession have led to a growing interest in derived specialties to the detriment of basic ones²⁴.

In Chile, 92% of fellowship-trained physicians are in the program they wished to follow, unlike general practitioners, where only half of them chose to do so²⁴. Furthermore, only approximately 50% of physicians pursue some specialty in Chile³. The other 50% would represent an opportunity to diminish the deficit if their reasons for declined a specialties were known.

In Chile, there is a discordance between the

high demand for fellowships and specialist care and the supply of admission to training programs for general practitioners. So, any public policy to strengthen socially relevant medical specialization should consider the aspects affecting the specialty choice, such as those mentioned in this article.

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