

Factors that influence a career choice in primary care among medical students from high-, middle-, and low-income countries: a systematic review

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ABSTRACT

Objective. To determine which factors influence a medical student's decision to choose a career in primary care; and to establish if these factors are similar or different among students in high-, middle- and low-income countries.

Methods. An extensive search was done of PubMed, Google Scholar, and Virtual Library of Health for articles on primary care careers published in 2003–2013 in English, Spanish, and/or Portuguese. Initially, 600 records were identified; 74 full-text articles were assessed for eligibility and 55 were selected (42 from high-income countries; 13 from middle- and low-income). These were assessed to identify intrinsic and extrinsic factors that influence career choice among medical students from high-, middle-, and low-income countries.

Results. A comparison framework with common and specific factors that influence career choice in primary care among medical students from high-, middle- and low-income was developed. Factors were classified as extrinsic or intrinsic, and as facilitators or barriers. Several factors common to all countries were identified: facilitators were exposure to rural location, role models, working conditions; barriers were low income, prestige, and medical school environment. Some factors specific to middle- and low-income countries were: understanding of rural needs and intellectual challenge. Other factors specific to high-income countries were: attitude towards social problems, voluntary work, influence of family, and length of residency.

Conclusions. Further studies on the subject are needed, especially in low- and middle-income countries. Identifying factors as barriers or facilitators for career choice will promote a better understanding of the reasons behind the shortage of primary care professionals and will contribute to policy building, improved training, and recruitment and retention of these professionals.

Key words

Career choice; students, medical; primary health care; human resources.

Many countries around the world are experiencing severe health staff shortages and unequal distribution of health personnel. The lack of physicians and

nurses is threatening the delivery of health care to vulnerable populations in remote areas. The number of medical students entering primary care residencies and the number of physicians going into family practice continue to decrease. Medical students still prefer hospital-related specialties and subspecialties, but

the need for primary care providers is expected to grow. In the United States, the shortage of primary care physicians was close to 30 000 in 2011 and is expected to increase to 45 400 by 2020 (1). In Canada, only one-third of the medical students are interested in entering a family medicine program (2), and in France,

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general practice is chosen by only 20% of medical students (3).

In middle- and low-income countries, the situation is even more critical because the shortage of trained health personnel has been exacerbated by the migration of doctors and nurses to high-income countries. In the last decade, almost 2 000 doctors from the Andean area have migrated to high-income countries (4). In Chile, the proportion of general practitioners to specialists was 36:64 in 2004, the opposite of the ideal proportion of 60:40 (5). In this same country, 69% of general physicians remain in general practice for less than 3 years before transferring into a specialty (5). In Peru, the density of doctors per 10 000 population was 7.7 in Lima, and less than 2.0 in several rural departments within the Andean and Amazon areas (6). Meanwhile, in parts of Africa, medical students are choosing specialties that do not reflect the continent's health care needs (7). Less than 5% of medical students from six Sub-Saharan African countries were interested in family medicine and only 4.8% intended to practice in rural areas (7). In Turkey, only 5%–10% of physicians who chose to specialize, indicated a preference for family medicine (8).

A prior review of the literature on the career decisionmaking process of medical students in the United States produced a conceptual model that illustrated the influence of certain factors on career decisions (9). In short, the model showed that some students are committed to primary care and choose PC careers; others have a positive attitude toward PC, but may or may not choose the field; others are undecided, and may or may not choose PC; and lastly, others who are not committed to PC, do not choose PC. The authors of the present study presumed that some barriers and facilitators would differ between students in high-income countries, such as the United States, and those in middle- and low-income countries. Identifying the differences could allow for a better understanding of the reasons behind the current shortage of PC physicians, and would contribute to policy building and decisionmaking that improves training and recruitment and retention of these professionals, especially at the rural level.

Therefore, in the present study, the authors sought to answer the question: What are the factors that influence medical students in low-, middle-, and

high-income countries when deciding on a career in primary care? And more specifically: (a) What are the intrinsic and extrinsic factors that influence the medical student to choose a career in PC, and (b) are these factors different for students in high-, middle-, and low-income countries?

MATERIALS AND METHODS

There were several working definitions that this study utilized: "primary care" was defined as "the entry point into the health system and the place for continuing health care for most people, most of the time" (10); "primary health care physicians" was the workforce that provides primary care in their practices (family and general practitioners, general internists, and general pediatricians); "extrinsic factors" were those originating or acting from the outside, i.e., external; and "intrinsic factors" were those acting from inside, i.e., inherent.

The reviewers performed several searches of literature indexed in PubMed, Google Scholar, and Virtual Health Library, using a broad set of terms to maximize sensitivity, i.e., a combination of key words and search terms related to "career choice" AND "medical students" AND "family practice" AND "factors" AND "incentives" AND "barriers." The reviewer followed links to find other related articles (snowballing technique).

Selection criteria

To be included in the sample, studies had to include a least one intrinsic or extrinsic factor that influenced career choice among medical students, and be descriptive and analytical, presenting qualitative and quantitative data. The papers also had to have been published in 2003–2013 in English, Spanish, and/or Portuguese. The use of three different databases and the inclusion of Spanish and Portuguese articles diversified the search and allowed for additional articles. Articles with a variety of study designs, including cross-sectional, cohort, longitudinal, systematic reviews, analytic, and qualitative studies, met the criteria. No studies that addressed career choice among students from other health professions, articles published before 2003, or in non-indexed journals and unofficial reports were included.

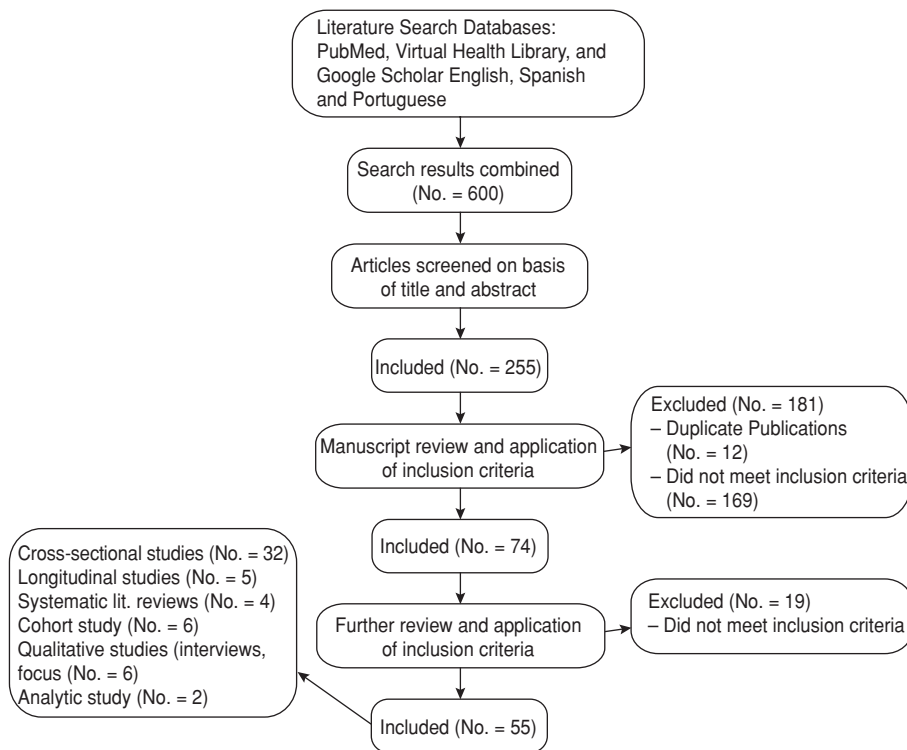
The selected studies were screened by title and abstract by three reviewers. Only full-text articles were assessed for eligibility, resulting in a total of 55 studies (Figure 1). The reviewers independently appraised and extracted details of the 55 articles using a standardized abstraction form that collected information on: the author, the journal, the year of publication, location, study objectives, study design, major findings, limitations, and observations. Reviewers identified intrinsic and extrinsic factors that influenced medical students' career choice, and grouped together factors that were shared by medical students from high-, middle-, and low-income countries. For those factors that were different, the reviewers grouped low- and middle-income countries as a single unit of analysis, and compared them with influential factors among medical students in high-income countries.

Quality assessment

Reviewers used the *Quality Assessment Tool for Quantitative Studies* (11), which rates articles on the following criteria: selection bias, study design, confounders, blinding, data collection method, and withdrawals/dropouts. Each criterion was assessed using the *Quality Assessment Tool for Quantitative Studies Dictionary* (12), a tool used to assist reviewers in scoring study quality by rating each section of a study as strong, moderate, or weak. A study was categorized as "strong" if it had no weak ratings, "moderate" if it had 1 weak rating, and "weak" if it had 2 or more weak ratings. For the qualitative studies, the *Critical Appraisal Skills Program* (CASP)(13) tool was used, which includes criteria such as reliability, validity, and objectivity. The tool includes 10 questions on aims, methodology, research design, recruitment strategy, and data analysis. A selected study was categorized as "strong" if it had 8–10 positive responses, "moderate" for 5–7, and "weak" for less than 5.

RESULTS

An initial search identified a total of 5 083 related records from the three databases. A refined search identified 600 records, which were later screened by title and abstract resulting in 255 articles. Of those 255 articles, 181 were not selected (169 did not meet the inclusion criteria

FIGURE 1. Selection of studies for a systematic review of career choices made by medical students in countries of differing income levels, 2003–2013**TABLE 1. Countries and number of studies included in a systematic review of factors influencing career choice among medical students in countries of differing income levels, 2003–2013**

High-income countries		Middle- and low-income countries	
Countries	No. studies	Countries	No. studies
Americas:		Africa:	
Canada	9	Ghana	1
United States	21	Kenya	1
Asia:		Americas:	
Japan	1	Brazil	1
Europe:		Chile	1
Germany	2	Trinidad and Tobago	1
United Kingdom	1	Europe:	
Oceania:		Greece	1
Australia	6	Middle East and Asia:	
New Zealand	2	Iraq	1
		Jordan	1
		Lebanon	1
		Malaysia	1
		Pakistan	1
		Saudi Arabia	1
		Turkey	1
Total	42	Total	13

and 12 were duplicates). The remaining 74 full-text articles were assessed for eligibility, of which 19 were excluded because on closer examination they did not meet the criteria.

A total of 55 studies were selected: 32 cross-sectional studies (58.1%); 4 systematic literature reviews (7.2%); 6 cohort prospective studies (10.9%); 6 qualitative studies including interviews and

focus groups (10.9%); 2 analytical studies (3.6%); and 5 longitudinal studies (9.1%). There was one article in Spanish and another in Portuguese; the rest were in English and all had been published in 2003–2013.

The selected articles discussed studies that had been carried out in 7 high-income countries (Australia, Canada, Germany, Japan, New Zealand, United Kingdom and United States), and 13 middle- and low-income countries (Brazil, Chile, Ghana, Greece, Iraq, Jordan, Kenya, Lebanon, Malaysia, Pakistan, Saudi Arabia, Turkey, Trinidad and Tobago). The systematic review included studies from 20 countries in Africa, the Americas, Asia, Europe, Middle East, and Oceania (see Table 1).

Of the articles from high-income countries, 10 (23.8%) were considered “strong” in terms of quality; 28 were “moderate” (66.7%); and 4 were “weak” (9.5%). Among the selected studies from middle- and low-income countries, there were no “strong” quality articles, and 30.8% were categorized as “weak.”

Key facilitators and barriers to career choice in primary care

High-income countries. Canada and the United States share many characteristics that influence medical students to follow a PC career. Being female and being married, engaged, or living with a partner (2, 9, 14–24) were facilitators of a PC career. Having a rural background or previous exposure to non-urban/rural environments were also facilitators in high-income countries (2, 14, 15, 22, 25, 26). Students with urban backgrounds had various reasons to follow a family practice career choice, including “. . . the opportunity to deal with a variety of medical problems; current debt load; and family, friends, or community” (14). This particular study (14) identified four factors significantly associated with students preferring family medicine: emphasis on continuity of care; length of residency; influence of family, friends, or community; and preference for working in rural communities. The influence of family, friends, and community was shown to be an important factor for career choice by several studies (14, 15, 27–29).

Scott and colleagues identified other characteristics among medical students who chose family practice, including having parents with no postgraduate

university education, not having family or close friends practicing medicine, having volunteered to work in a developing country, desire for a broader scope of medical practice, an orientation toward society, a lower interest in research, desire for short postgraduate training, and "lower preference for medical versus social problems" (17). Having family physician mentors was also an important factor that influenced the decision to choose a family practice career in most of the high-income countries analyzed (30).

Positive attitudes regarding professional responsibility toward underserved populations was a factor associated with primary care residency. A societal orientation ("working with the poor," "altruistic personal values," "underserved populations," "dealing with people") was a predictor for choosing a family PC career in Canada (17, 24) and the United States (9, 31–35). Wayne did not find this association in a later cohort (36).

In two studies, most of the participants who were considering a career in primary care or a rural practice came from public medical schools (9, 37). Rabinowitz found that planning to become a family physician or to work in a rural setting was related to a career choice in primary care (25). Less interest in research was a common trait among students who were interested in pursuing a career in PC (9, 17, 38). The short length of a family medicine residency program was also considered a facilitator for medical students (2, 14, 17, 39); so was early exposure to general practice (in quality and quantity) (29, 40). The varied scope of practice in primary care careers was a predictor of moving into that professional direction (17, 24, 33, 41). Financial incentive was a factor that positively influenced career choice (42). Flexibility of work (working conditions) was an important factor to opt for PC careers in two studies (43), as well as being less hospital-oriented (24, 44).

There were several intrinsic factors that were associated with a PC career choice, including having a social/extroverted personality type (15, 21), being a patient-oriented student (18), and having volunteered in a developing nation (17, 22).

German medical students considered factors such as gender (female), age (older), patient orientation, "the possibility to work with a broad spectrum of patients and diseases in a long-term care basis," and "good compatibility of work

and family life," as the main reasons to pursue a family practice career (18, 45).

Among the barriers to follow a PC career path, low income and/or debt were identified as major factors by several authors (19, 23, 34, 35, 37, 43, 46–48). Interest in research was a negative factor among students (19, 49), as well as the low prestige given to primary care careers (19, 20, 37, 43). Aspects of medical school training were identified as barriers to influencing medical students to become family physicians: family medicine poorly reflected in the curricula, lack of exposure to family practitioners, and negative perception of family doctors were the main determinants (34, 50). The breadth of knowledge needed in family medicine was a barrier for students in two reviewed studies (37, 43).

Middle- and low-income countries.

Among demographic characteristics, being a female was a common attribute among students who were considering PC in Lebanon (51), and among those who intended to apply for pediatrics in Kenya and Pakistan (52, 53). On the other hand, in Ghana, male medical students predominated among those who chose a PC career or a rural practice (54), while in Saudi Arabia, gender was not an important factor (55).

Rural origin and having lived in a rural area were attributes of medical students from Ghana who were considering PC career. Financial reward was perceived as a facilitator to a PC career in Kenya (52); and in Greece, the guarantee of employment upon completion of a residency program was a main factor in choosing a general practice career (56).

Primary care became more popular as Saudi Arabian students advanced in their careers (55). A role model could have a positive or negative influence, but the evidence demonstrated that it is an important factor in deciding on a career (5, 52, 57). Student participants from Lebanon and Trinidad considered "intellectual challenge" as an influential factor when deciding on a PC career (51, 58). "Benefits for the patient" was a determinant for career choice in Turkey, Malaysia, and Trinidad (8, 57, 58), while "social responsibility" was a determinant for career choice only in Lebanon (51). Lifestyle was a facilitator only among students from Trinidad (58).

Low income was an important barrier among medical students interested in a

PC program in Turkey, Brazil, Jordan, and Trinidad (8, 58–60). Debt was a barrier only for Brazilian medical students (59).

Other negative influences were low research opportunities in Kenya (52) and the emphasis given to specialized medicine in Chile (5). Students from Brazil and Chile considered the medical school environment a barrier for the following reasons: little emphasis on PC, family medicine not reflected in the curricula, and hospital-centered practices (5, 59). The low prestige of family medicine was a barrier among students in Brazil, Greece, Jordan, and Trinidad (58–60).

Common factors. Previous exposure to a rural area, having a rural background, influence of role models, and working conditions were extrinsic factors that acted as facilitators (Figure 2). There were also some barriers that were common to low-, middle- and high-income countries. Limited research opportunities was a common extrinsic factor, while low income, lack of prestige in primary care specialties, and a medical school environment biased towards hospital-based care were common extrinsic factors. Being female was usually a facilitator, although one study referred to it as a barrier (16). Figure 2 summarizes the main findings, showing a larger number of facilitators compared with barriers. However, it does not mean that there are more facilitators for career choice in PC, since some of the barriers could have a greater influence.

There were various factors, predominantly intrinsic, that influenced career intention in PC before admission into medical school, while other factors, mainly extrinsic, influenced medical students during the training process (Figure 3). This study did not analyze factors that influence career choice among physicians; but, the researchers do believe that the principal effort to promote primary care careers among medical students should be during the admissions process and throughout medical training, even if it is not a guarantee of final career choice.

DISCUSSION

The significantly higher yield of studies on the topic from high-income countries versus middle- and low-income countries is indicative of an inverse relationship with the actual health needs

FIGURE 2. Facilitators and barriers that influence career path among medical students, and underlying extrinsic and intrinsic factors of influence, in high-, middle- and low-income countries, 2003–2013

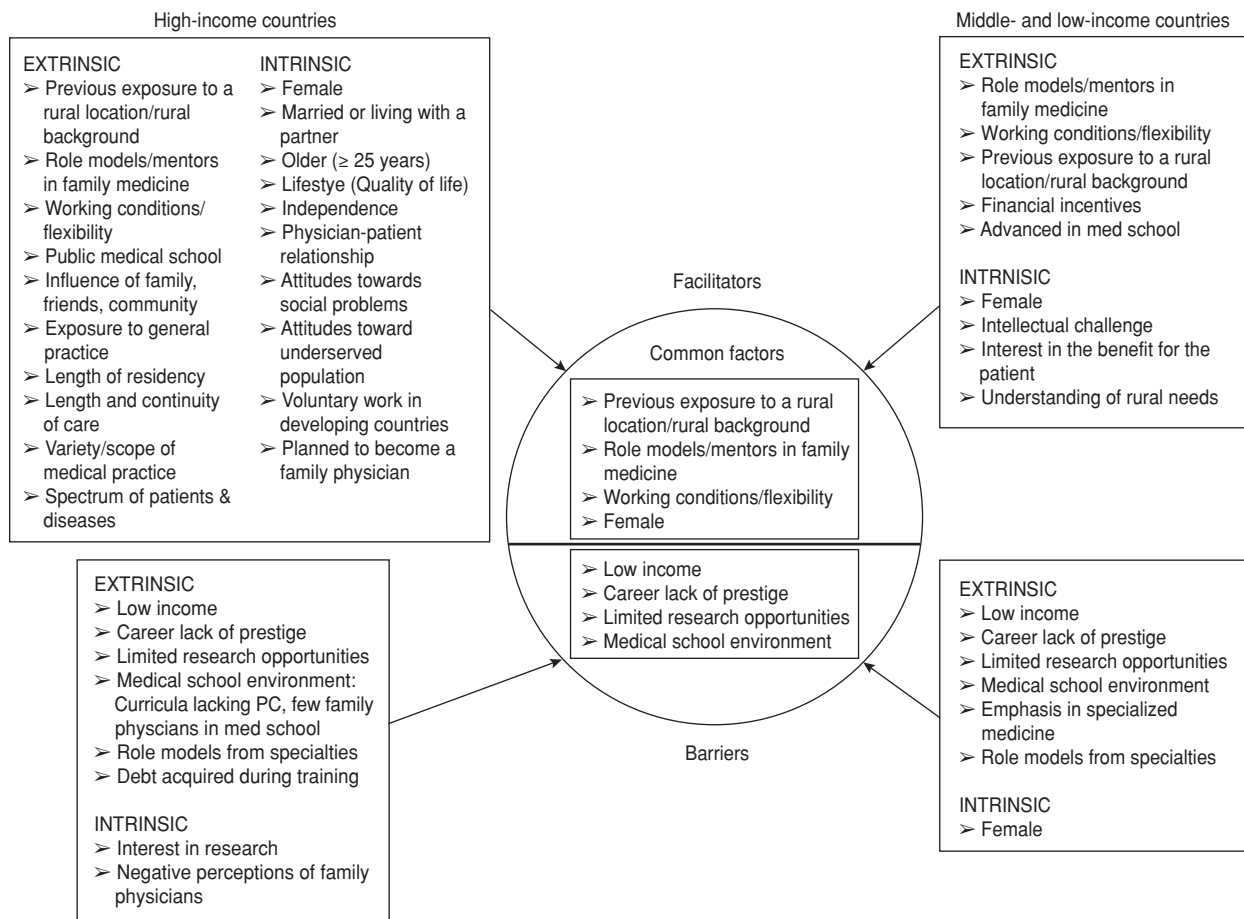
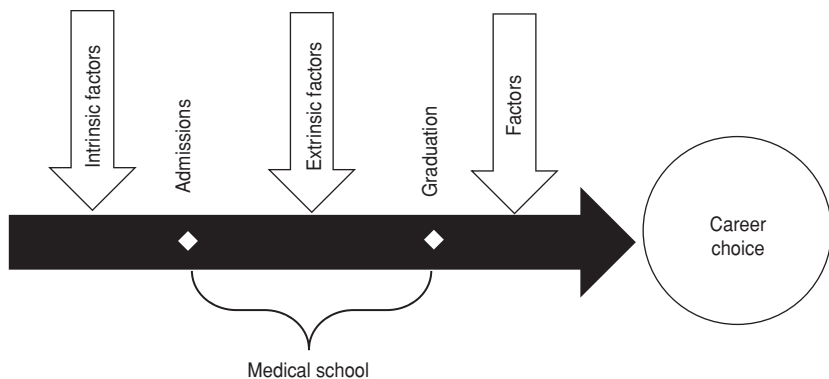


FIGURE 3. Factors determining a career choice in primary care: a temporal approach



of the population. Of the 55 studies selected, 76% were from high-income countries, with studies from the United States making up 38% of the total and 50% of the high-income countries.

Most of the positive intrinsic factors were specific to high- or middle- and low-income countries, and were mostly related to demographics (being married, older), or to positive social attitudes towards underserved populations. Extrinsic facilitators in high-income countries mostly related to the type of practice in primary care and its advantages compared to a hospital-based specialty (length of residency, length and continuity of care, variety and scope of medical practice, spectrum of patients and diseases, work conditions and flexibility). Some barriers identified by medical students are challenging to overcome (low income, career lack of prestige, medical school environment, limited research opportunities)

and the solutions must have a comprehensive approach.

Factors relating to altruistic orientation were more common among medical students from high-income countries, than from the other groups. Though it was expected that students from middle- and low-income countries would be more sensitive to the

social needs of the population, the selected studies did not show that correlation. Only Turkish medical students included “interest in benefits for the patient” as a factor that influenced their career intention (8). Perhaps medical students from middle- and low-income countries expect to climb the social and economic ladder, and choosing a PC ca-

reer may seem insufficient for fulfilling those expectations.

There are key factors within a medical school environment that influence career choice among medical students. Beginning with the selection process, medical school plays an important role in identifying students who are interested in following a primary care path (e.g., by encouraging applications from students with a rural background). Curricula design, participation of family physicians as faculty, early involvement of students in community activities, and development of a positive attitude towards primary and rural care are some of the elements where the medical school can play an important role.

Public and private medical schools have a social responsibility to the community they serve, and must adjust to local and regional needs. The evidence from this study emphasizes the importance of strengthening rural practice programs where medical students have an early involvement in community health problems. Collaboration between academic institutions and health providers can be promoted with or without government participation to identify common objectives.

Study limitations

There were some limitations in this review. Although the selected studies came from a total of 20 countries from all the WHO Regions, they cannot be considered a representative sample of all the world's countries. Furthermore, some of the studies from low- and middle-

income countries were of lesser quality because the sample sizes were smaller and, in most of the cases, from a single institution. There is the possibility that some published studies that would have met the inclusion criteria did not appear in the three databases, although snowballing was used to at least partially correct this limitation. Additionally, unpublished studies from low- and middle-income countries were not represented (publication bias). The exclusion of articles published before 2003 may have omitted literature that could have provided valuable information.

Conclusions

The limited research on the topic in middle- and low-income countries could be related to a lack of interest in this particular area, or to an overall deficit in research in developing nations, or both. There is a need to expand research on these areas, including evaluating interventions aimed at increasing the number of PC professionals and assessing their impact on national health systems. More research on the subject would assist in promoting health policy at the local, municipal, national, and Regional level.

Perhaps early interventions among medical students could improve the chances that they will follow a primary care career, but more studies are needed to ascertain if this is true. When reviewing applications, medical schools interested in PC should take into consideration intrinsic factors, such as sex, age, and rural background. However, the environment will continue to act as

a barrier: medical schools everywhere continue offering hospital-centered medical training, governments continue paying low salaries to PC physicians, and society as a whole continues to grant less prestige to PC practitioners. A comprehensive approach that includes state involvement to create incentives (salary, bonuses), defines public policy in human resources for health, re-orientes medical training, prioritizes primary care, and increases the prestige of PC careers at all levels of society is necessary.

In conclusion, this review of the literature identified intrinsic and extrinsic factors that influence medical students' career decisions. Some factors were similar and others were different among students in high-, middle- and low-income countries. This study demonstrated the need for more descriptive and analytical studies on the subject in low- and middle-income countries. Interventions aimed at increasing the number of medical students who choose primary care must be documented and their effectiveness and impact must be evaluated. On a macro level, it is necessary to evaluate the impact that national health systems and health care models have on career choice among medical students, especially in middle- and low-income countries.

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Conflicts of interest. None.

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RESUMEN**Factores que influyen en la elección de una carrera en atención primaria entre estudiantes de medicina de países de ingresos altos, medianos y bajos: una revisión sistemática**

Objetivo. Determinar los factores que influyen en la decisión de un estudiante de medicina de dedicarse profesionalmente a la atención primaria; y establecer si estos factores son similares o diferentes entre estudiantes de países de ingresos altos, medianos y bajos.

Métodos. Se llevó a cabo una extensa búsqueda en PubMed, en Google Académico y en la Biblioteca Virtual en Salud de artículos sobre selección de carrera en atención primaria publicados entre 2003 y 2013 en inglés, español o portugués. Inicialmente, se seleccionaron 600 registros; se evaluó la idoneidad de 74 artículos de texto completo, y de estos se seleccionaron 55 (42 de países de ingresos altos, 13 de países de ingresos medianos y bajos). Se evaluaron los artículos con el objeto de determinar cuáles eran los factores intrínsecos y extrínsecos que influían en la elección profesional de los estudiantes de medicina de países de ingresos altos, medianos y bajos.

Resultados. Se elaboró un marco de comparación de los factores comunes y específicos que influyen en la elección profesional de atención primaria por parte de los estudiantes de medicina de países de ingresos altos, medianos y bajos. Los factores se clasificaron como extrínsecos o intrínsecos, y como facilitadores o barreras. Se determinaron varios factores comunes a todos los países: la exposición a un entorno rural, los modelos a imitar y las condiciones laborales actuaban como facilitadores; los ingresos bajos, el escaso prestigio y el entorno propio de las facultades de medicina actuaban como barreras. Algunos factores específicos de países de ingresos medianos y bajos fueron la comprensión de las necesidades rurales y el desafío intelectual. Otros factores específicos de países de ingresos altos fueron la actitud hacia los problemas sociales, el haber trabajado como voluntario, la influencia de la familia y la duración del período de residencia.

Conclusiones. Se requieren nuevos estudios sobre el tema, especialmente en países de ingresos medianos y bajos. Determinar si estos factores actúan como barreras o facilitadores de la elección profesional ayudará a comprender los motivos de la escasez de profesionales de atención primaria y contribuirá a la elaboración de políticas, a mejorar la capacitación, y a captar a estos profesionales y garantizar su permanencia.

Palabras clave

Selección de profesión; estudiantes de medicina; atención primaria de salud; recursos humanos.