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CAREER ISSUES

Selective Training and Cross-year Clinical Tutoring as Educational Influences on Generalist Career Choice

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ABSTRACT **Context:** *This study was undertaken with all 299 graduates of 12 consecutive classes (in 6 years) of a Brazilian medical school.*
Purpose: *To appraise the relationships of gender, early preference for a career, the experience of selective training (a form of elective clerkship) and student preceptorship (cross-year clinical tutoring by peers), with the career choices of graduates.*
Method: *Data were obtained at three points: at the beginning of medical studies, on career preference; at the end of medical studies, on selective traineeship and student preceptorship; and after graduation, on medical residency selected. Chi-square tests and logistic regression analysis were done on the data of the graduates, grouped in terms of choice, or not, of frontline care specialties (internal medicine, pediatrics or obstetrics–gynecology).*
Results: *Findings are presented on 299 graduates, of whom 48.5% were female, and 53.8% preferred frontline care (FC) specialties at the beginning of the program. After graduation, 50.2% of the subjects chose FC specialties, among which two-thirds had kept their early preference for a specific specialty. Logistic regression analysis predicted 86.7% of the graduates' choices of FC specialties. Female gender, early preference, student preceptorship and, mostly, selective traineeship in the same broad area were significant factors.*
Conclusion: *In this study a strong association was found between selective traineeship and career choice of FC specialties in relation to three additional predictive factors. It also revealed student preceptorship as a factor of potential educational significance in the career decision process and as a matter of institutional concern.*

KEYWORDS *Career choice, undergraduate clinical training, medical student, student preceptorship (cross-year tutoring of peers).*

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Introduction

Medical graduates' choice of a work area is an important factor related to medical workforce composition. In most countries, a few types of physicians, usually called generalists, provide the bulk of primary health care. The graduates' career choices affect the distribution of professionals in the various levels of health care and the public's access to medical care.

Many studies point out the multidimensional nature of career decisions and the choice of a medical work profile (Davis *et al*., 1990; Bland *et al*., 1995; Meurer, 1995). Options for different specialties seem to be influenced diversely by multiple factors preceding or concomitant to medical education. Some studies support the theoretical framework proposed by Ernst and Yett (1985) regarding the predominant role of personal characteristics and medical school experiences in career decision (Xu *et al*., 1997).

Antecedent factors, such as attitudes, sociodemographic attributes and early preferences seem to converge to the definition of student values and influence the type and stability of choice (Bland *et al*., 1995). Perceived societal needs and primary care orientation, for example, are factors associated with the generalist specialty choice (Ellsbury *et al*., 1996).

The influence of the medical school experience in the confirmation or elimination of the initial preference and the inclusion of a new preference have been pointed out by many studies, although there are some disclaimers. Such influence occurs mostly during clinical training in the form of required or elective experiences, but it also involves the role of mentors and other features of the medical school (Meurer, 1995; Burack *et al*., 1997; Senf *et al*., 1997; Xu *et al*., 1997; Ellsbury *et al*., 1998).

The general aim of this paper is to explore influences on career choice, as part of an ongoing series of studies at a Brazilian medical school. In a previous report we assessed the relationships of personal and experiential factors with the career choice path of the graduates. We found evidence for the role of selective traineeship (a form of elective clerkship training) as a predictor in the choice of a first medical residency in five different specialties (Sobral, 1998).

The current study focused on the combined effects of four main factors on career choice during a 6-year timeframe. The analysis included two personal factors (gender and early preference for a career) and two experiential factors (selective traineeship and student preceptorship by peers in clinical courses). We examined the two types of experience because they seemed to express critical student decisions related to the immediate career choice path after graduation. In addition, although the potential influence of student preceptorship in the career choice process has not been studied many graduates volunteer that this experience affected their decisions. The purpose of this study was to examine the differential impact of such factors on the dichotomous choice between generalist and non-generalist specialties. We defined the generalist cluster as including internal medicine, pediatrics and gynecology–

obstetrics, which we classified as frontline care specialties. The classification derives from the fact that these three specialties provide the medical workforce of the outpatient clinics and health centers that supply the bulk of primary care in Brasilia and most other Brazilian cities served by our graduates. Although family medicine belongs to this cluster the opportunities for residency training in this specialty are still restricted in our country. Three questions were examined in the present work:

1. What was the first medical residency of choice among the graduates?
2. What was the relative strength of the relationship between each identified factor and the choice of either a generalist or non-generalist specialty?
3. How did the factors differ among the generalist specialties?

Methods

Subjects

This study focused on all graduates of the new phase of the medical program at the University of Brasilia between 1994 and 1999. Females accounted for 48.5% of the 299 graduates of the 12 consecutive classes during 6 years.

Setting

The 6-year undergraduate program features 42 (18 clinical) required courses and a three-semester internship in a general hospital. After the 48-week rotation in the four clinical areas, each student chooses one area for selective training among internal medicine, general surgery, pediatrics or obstetrics–gynecology. All these specialties provide experiences in outpatient units, emergency rooms and wards.

From the second to the last semester of the medical program any student who has obtained credit in a course can apply to serve as a cross-year tutor in that course. Cross-year tutoring is a kind of preceptorship for regular students as they take each course. The student preceptors are given some preparation for their tasks, including an orientation by the course coordinators. The student preceptors' responsibilities include helping their cross-year peers with their learning tasks and providing feedback to both students and teachers. Although tutor selection is mostly based on their academic records, lower rank is not a barrier if the student is clearly interested in the preceptorship experience.

Procedures and Measures

An orientation questionnaire at the start of the program obtained the early career preference and personal characteristics of the students. Areas of focus include learning style, learner self-confidence (Sobral, 1998), and career preference (based on ratings among a list of specialties).

Preceptorship data (semester, course when undertaken, and evaluation) were obtained from the undergraduate records. Career choice was defined as the residency specialty selected by the graduate. If there was more than one, the final or best-ranked selection was used. For purposes of analysis and taking into account the provision of health care services at the primary level, the specialties of internal medicine, pediatrics, obstetrics–gynecology and general/family medicine were coded as frontline care (FC) career options. All other specialties were coded as non-frontline care (NFC) career options.

Analysis

The work of Norman and Streiner (1994) guided the analysis. The statistical procedures used were (a) chi-squared tests for comparison of graduates' descriptors between groups and (b) logistic regression analyses to examine the association between selected characteristics and the choice of a FC residency as an outcome variable (Kassebaum *et al.*, 1996).

Results

No significant historical trends were observed over the study timeframe in the subjects' responses regarding personal characteristics, gender and career options at the start and at the end of the medical program. The 6 years of data were merged for the main analysis.

Analysis of career option at the beginning of the program revealed that 161 (53.8%) graduates had early preferences for FC specialties (30.4% internal medicine, 10.7% pediatrics, 7.4% obstetrics–gynecology and 5.3% general practice). The other 138 (46.2%) graduates had an early preference for NFC specialties (37.8% surgery and surgical specialties, and 8.4% other specialties or no preference). A greater proportion of women than men (58.7% vs. 41.3%) preferred FC specialties to NFC specialties (chi-square=8,3; df=1; p=0.004).

About 62% of the subjects had chosen selective training in a frontline specialty. Within this group, 68.3% had an initial preference for a FC specialty, but about half of the time it was not for the same specialty.

Almost all (95.3%) subjects had at least one preceptorship experience before graduation. A significantly greater proportion of women than men had preceptorship experience in FC-related courses. Table 1 shows the distribution of preceptorship experiences in the fifth and sixth years of the program. The type of experience was clearly related to selection or not of a FC residency specialty.

The residency registration revealed that 50.2% of the graduates chose FC specialties (30.1% internal medicine, 12.0% pediatrics and 8.0% gynecology–obstetrics). On the other hand, 48.2% of the graduates chose NFC specialties (35.1% surgery and surgical specialties, and 13.0% other specialties). Five graduates (1.8%) did not register. About 31% of the subjects changed their

Table 1. Distribution of graduates by type of experience of student preceptorship in the fifth and sixth years and specialty choice (FC or NFC)[a] in the first medical residency

Preceptorship experience[b]	Specialty choice NFC	FC	Total
NFC courses	37	6	43
Mixed (FC + NFC) courses	29	8	37
None	26	24	50
FC courses	52	113	165
Total	144	151	295

Chi-square = 56.8; df = 3; $p = 0.000$.
[a]FC = frontline care specialties (internal medicine, pediatrics or gynecology–obstetrics), NFC = all other specialties not included in FC.
[b]Cross-year tutoring of peers in clinical courses.

specialty category option (FC vs. NFC) from the start of undergraduate program to the medical residency. Table 2 shows the graduates' career choices as expressed by first option for residency training. The gender difference among the career groups was strongly significant (chi-square=26.5; df=8; p=0.001).

Table 3 shows the results of the logistic regression model using gender, early preference, student preceptorship and selective training as predictor variables. The model correctly predicted overall dichotomous choices (FC vs. NFC) in 81.7% of cases and correctly predicted frontline choices 86.7% of the time. All four variables were implicated in frontline specialty choice but selective training option was by far the strongest factor. Students taking the surgical instead of other clinical electives were about 24 times less likely to choose a frontline specialty at graduation.

The comparisons of factor distribution among the three groups of frontline specialties are shown in Table 4. No significant differences were found among them in gender distribution, matching of career choice with early preference or student preceptorship in the area of choice. The three groups differed significantly in the proportion of graduates featuring selective training in the same area of residency choice. The positive predictive value of exposure to selective training regarding an outcome of residency choice in the same area was greater for internal medicine than for other groups.

Discussion

An interesting study of the decision-making process in career choice by Burack *et al.* (1997) revealed distinct influences in the comparison between broader and narrower areas of medical work. A search for personal compatibility seemed to be involved. The current findings suggest that this search is at the crossroads by the end of the undergraduate program, and just four factors could predict over

Table 2. Distribution of graduates by gender and first medical residency choice

Area of residency choice	M	F	Total
Internal medicine	41	49	90
General surgery	45	16	61
Pediatrics	11	25	36
Obstetrics–gynecology	10	14	24
Ophthalmology	13	11	24
Anesthesiology	4	10	14
Surgical specialties[a]	11	9	20
Diagnostic medicine[b]	14	6	20
Other	5	5	10
Total	154	145	299

Chi-square = 26.5; df = 8; $p = 0.001$.
[a]Includes otorhinolaryngology (4/7), orthopedics (3/1) and neurosurgery (4/1).
[b]Includes radiology (10/3) and pathology (4/3).

Table 3. Logistic regression model of factors associated with graduates' choice of medical residency in frontline care specialties (FC)

Factors[a]	Coefficient B	Significance	Partial R	Odds ratio	95% CI
Gender (F/M)	0.98	0.00	0.12	2.6	1.4–5.2
Early preference for FC	0.64	0.05	0.06	1.9	1.0–3.7
Preceptorship in FC[b]	0.91	0.00	0.12	2.5	1.3–4.8
Selective training in FC	3.18	0.00	0.39	24.1	11.1–52.1
(Constant)	−3.40	0.00			

[a]The dependent variable was choice of a FC residency. FC = frontline care specialties (internal medicine, pediatrics or gynecology–obstetrics).
[b]Dichotomized as student preceptorship in FC vs. all the rest (mixed, NFC or none).

80% of choices dichotomized between frontline and non-frontline care specialties.

How much of the choice is binding to personal or experiential influences? Graduates' residency options revealed a choice profile not too different from the early preference profile. Much of the stability seems associated with gender and early preference effects. The relationship between the choice of a frontline care specialty and the strength of early preference for this broad type of option highlights the idea of confirmation of values, in terms of meeting personal or social needs heeded by the students.

Gender was also a definite predictor of choice of FC specialties, and the gender distinction was maintained from the statement of career preference at the start of the medical undergraduate program to the choice decision at

Table 4. Distribution of factors among the FC specialty groups

Factors (predictor values)	Specialty areas: Internal medicine	General pediatrics	Gynecology–obstetrics	*p* value
Gender				
Men	41	11	10	0.30
Women	49	25	14	
Early preference for the specialty				
Yes	43	14	6	0.14
No	46	22	17	
Preceptorship in the specialty				
Yes	60	23	12	0.32
No	30	13	12	
Selective training in the specialty				
Yes	68	36	20	0.00
No	22	0	4	

Chi-square tests were performed on the three FC (frontline care specialty) groups by each of the four factors listed.

graduation. Currently, the gender barrier is of minor significance but the gender effect could be a proxy for closely related personal values and attributes (Ellsbury *et al.*, 1996).

About one-third of the students moved from one specialty category (FC vs. NFC) to the other between the start and end of their undergraduate program. This change may suggest some influence by the medical school in career choice. The finding of student preceptorship as a significant factor in the logistic regression model could be viewed from this perspective. The match of preceptorship in FC-related clinical courses with the choice of FC specialties suggests that this experience could serve as a mentored opportunity to mold the decision to pursue a related work path. Indeed, about 52% of the students asserted that the preceptorship was a positive influence on their intended choice of specialty (unreported data).

It appears then that the preceptorship experience is a potential educational influence on the process of career decision. Inasmuch as it is under the control of the medical school, the preceptorship program could be explored to serve the mission of the institution regarding the preferred balance of the medical workforce.

The strong association between the area of selective training (FC or NFC) and the corresponding registration in medical residency suggests that this clinical experience stands for a decisive step in the matching of personal compatibility with the future career. Selective training seems to relate to the

immediate choice of graduates through two processes. It may be reinforcing the perceptions of the characteristics of the specialty and/or confirming personal values held by the subjects regarding the role and environment of medical work.

Most of all, selective training probably reinforced their perceptions of the characteristics of the respective specialty (in terms of content, procedures, types of problems and contact with patients, as entailed by the training area). The in-depth experience provides students many possibilities to confirm or disconfirm avowed preferences and expectations raised by previous exposures in clinical courses, rotating clerkships and possibly preceptorships.

Overall, the findings of the study suggest that the choice of the three frontline specialties have some common roots in the postulated search process for personal compatibility. However, by the time of selective training they have clearly branched off. Moreover, there is a good measure of variation among such specialties in terms of the influences, timing and stability of choices, which were not explored in this work but may be found in the literature (Zeldow *et al.*, 1992; Kassebaum & Szenas, 1995).

Conclusion

The study showed that the experience of selective training had a much stronger association with the choice or not of a career in frontline care specialties than three other predictors: gender, student preceptorship in clinical courses and early preference for a career. It also revealed student preceptorship as a predictive factor of potential educational significance to be further examined as an institutional strategy.

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