

The influence of gender and personality traits on the career planning of Swiss medical students

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Summary

Background and objectives: Since the 1990s, as many women as men have been entering and graduating from medical schools in Western countries. Up to date, prospective studies of physicians' career paths are lacking. This paper presents the data of the first assessment of a longitudinal survey of a cohort of Swiss medical school graduates, evaluated with regard to how gender and personality traits contribute to their academic achievement and further career planning.

Methods: In 2001, 719 graduate students (52.9% females, 47.1% males) returned a postal questionnaire comprising sections on personality traits, career motivation, and career planning.

Results: Female graduates scored higher on traits such as helpfulness, relationship consciousness, empathy, family responsibility, and job security. Male students scored higher on traits such as independence, decisiveness, self-confidence, activity, income, and prestige. Women were further advanced in the writing of their thesis ($p = 0.04$),

chose different topics ($p < 0.001$), and had more often decided in which field they wished to specialise ($p = .02$). Women preferred fields with intensive patient contact ($p < 0.01$), men tended to specialise more in instrumentally oriented and high-technology medicine ($p < 0.001$). The regression model revealed that, apart from gender (being female), instrumentality and extrinsic career motivation predict advanced academic achievement, whereas self-esteem and intrinsic career motivation influence the choice of speciality.

Conclusions: The results indicate that women plan their career more purposefully than men, and that not only gender but also personality traits and career motivation play an important role in academic achievement and career planning.

Key words: medical students; gender; personality traits; career motivation; academic achievement; career plans; speciality choice

Introduction

In recent years, as many women as men have been entering and graduating from medical school in Western countries. Women students are as successful as their male colleagues [1, 2]. The majority of young physicians undergo a residency program in a medical speciality. Of all physicians currently working in Switzerland, 54% of the women and 84% of the men are certified in a medical speciality after six to eight years of residency [3]. In Germany, 56% of female physicians and 72% of male physicians possess a speciality certificate [4]. Female and male doctors, however, tend to specialise in certain gender-typical disciplines. More female than male physicians do their residency in general or primary care fields, gynaecology, paediatrics, and psychiatry. The men still outnumber the women in higher-prestige disciplines such as sur-

gical specialities and in hospital medical specialities [5, 6].

To date, there have been very few prospective studies investigating the various determinants of career development of young physicians. Sieverding [7] reported that female gender identity acted as a central psychological barrier for women in realising their career objectives. Abele and Nitsche [1] found that, after three years of residency, women physicians had progressed less in their careers. The authors cited the gearing of women physicians' career planning towards the compatibility of profession and family as the main reason for this.

The aim of the present study was to follow medical school graduates into residency up to their specialist qualification, in order to investigate the

contributions of gender, personality traits, and career motivation to their subsequent professional career paths and living arrangements. This paper reports cross-sectional data from the first measurement of final-year medical students of the universities of Basel, Berne, and Zurich. The aims of the first assessment were to investigate (1) gender-related personality traits and career motivation of the participants, (2) the progress in writing of their thesis, and the topics chosen by the students dependent on gender. Furthermore, it was of inter-

est, (3) how many of the graduates had already decided on the speciality in which they wished to obtain further qualifications, and whether there were gender-typical preferences. The following were evaluated in a multivariate model, (4) what was the contribution of gender, personality traits, and career motivation to the prediction of being further advanced in the writing of the thesis, having decided what medical field to specialise in later, and having decided to specialise in a surgical speciality.

Methods

Instruments

The questionnaire consisted of the following components:

Sense of Coherence Scale, SOC-13 [8], is a 13-item comprehensive one-dimensional short version of the SOC. It uses self-rating on a 7-point Likert scale to measure the individual's salutogenic potential over three components: comprehensibility, manageability, and meaningfulness. The endpoints of the scale are labelled with the extreme answers (a value of 1 refers to the minimum, 7 represents the maximum value, indicating a high Sense of Coherence). The SOC is a measure of a person's resistance to stress and their ability to manage stress. Schuhmacher et al. [9] reported the following normal population means: for males 5.18, SD 0.93, for females 4.96, SD 0.89, and Cronbach's alpha 0.85.

Rosenberg-Self-Esteem-Scale RSE [10] contains ten items scored on a four-point scale from "strongly agree" to "strongly disagree". Means of 2.31 (males) and 2.23 (females) and Cronbach's alpha of 0.79–0.88 were reported by Ferring and Filipp [11] in a population-based sample.

Personal Attributes Questionnaire, GE-PAQ, German Extended Personal Attributes Questionnaire [12] is a self-rating instrument for the assessment of gender-role orientation. It consists of 16 bipolar item pairs that are rated on six-point scales. The bipolar items describe gender-stereotypical characteristics (eg, not at all independent – very independent). Eight items constitute a scale for "masculine" characteristics (*Instrumentality PAQ-I*). This scale contains instrumental, agentic traits (eg, "independent") that are considered to be socially desirable to some degree in both sexes but stereotypically more characteristic of males. The second scale (*Expressiveness, PAQ-E*) contains eight "feminine" items that describe socially desirable expressive, communal traits (eg, "helpful") that are stereotypically more characteristic of females. Alfermann [13] reported means of 3.75 (males) and 3.50 (females) for PAQ-I, 4.38 (males) and 4.63 (females) for PAQ-E, Cronbach's alpha 0.72 (PAQ-I) and 0.75 (PAQ-E).

Career Motivation Questionnaire CMQ [14] consists of 24 items rated on a seven-point scale (1 "not true" – 7 "very

true"). Eight items constitute a scale each: *Intrinsic Career Motivation CMQ-I* (ie, enjoyment of and interest in professional activities), *Extrinsic Career Motivation CMQ-E* (ie, striving for promotion, income, prestige) and *Extra-professional Concerns CMQ-EC* (ie, prioritising family, convenient working hours, job security). In a large German student sample, Abele [14] reported the following reference data: CMQ-I: mean 5.96, SD 0.60, Cronbach's alpha 0.70; CMQ-E: mean 4.17, SD 1.07, Cronbach's alpha 0.76; CMQ-EC: mean 4.30, SD 1.06, Cronbach's alpha 0.72.

Doctoral thesis: in progress/already finished or not yet started, and type of thesis.

Further specialisation: choice, decision regarding speciality, and factors which are important for the type of speciality chosen.

Socio-demographic data

Sample: a cohort of 1004 medical students of the three medical schools of the German-speaking part of Switzerland was approached in their final year of medical school in 2001. Three hundred eighty of the 487 female students agreed to participate (78.0%), as did 339 of the 517 males (65.6%), a total return rate of 71.6%. Significantly more female students participated in the study ($p < 0.05$). The study sample ($n = 719$) consists of 52.9% females and 47.1% males. Mean age was 27.4 years (SD 2.42 years, range 23–44 years). Of the participants, 96.5% were Swiss citizens, 3.2% were from other European countries, and 0.3% were from outside Europe. Only 5.8% of the students were married, and 3.6% had children.

To ensure participants' anonymity, the returned questionnaires could only be identified by a code. The respondents sent their addresses to an independent address-administration office.

Statistical analysis

Issue 1 was investigated by independent sample t-tests, issues 2 and 3 by chi-square tests, and issue 4 by logistic regression analyses (backward stepwise method).

Results

Personality traits and career motivation

Table 1 shows the means, standard deviations, and Cronbach's alphas for the scales measuring personality traits and career motivation. There are significant gender-related differences in the means of the instrumentality and expressiveness scales of the PAQ, and in the extrinsic and extra-professional concerns of the CMQ. Female respondents score higher on expressiveness and extra-professional concerns, males on instrumentality and extrinsic career motivation.

Frequency and topic of doctoral thesis

Of the total study sample, 545 subjects (75.8%), 297 females (78.2% of all female participants), and 248 males (73.2% of all male participants) had either already finished their doctoral thesis, or were currently working on it. Women students were significantly further advanced with their thesis ($p = 0.04$).

Of interest was the thesis topic chosen by the participants. Table 2 shows that about one-third each of both female and male students had either performed an evaluation of therapeutic procedures based on data from medical-records, or had done

experimental empirical work, respectively. A thesis based on data gathered from patient interviews or questionnaires (non-experimental empirical work) was performed by another 13.8% of the study sample. Only a very few students (1.5%) wrote a literature review. Significantly more female students conducted an evaluation of therapeutic procedures, while significantly more male students opted for experimental empirical work.

Further specialisation

Of the total study sample, 407 students (56.6%) had already decided which speciality they wished to pursue later, significantly more women (60.7%) than men (51.9%) ($p = 0.02$). Table 3 shows their intended specialities. Females' ranking is (1) internal medicine, (2) paediatrics, (3) gynaecology, (4) primary care, and (5) surgery; males' ranking is (1) surgery, (2) internal medicine, (3) primary care, (4) anaesthesiology, and (5) paediatrics. There is a significant difference between men's and women's choice of speciality: male physicians more often choose surgical fields, while women prefer to specialise in paediatrics and gynaecology ($p < 0.001$).

Table 1

Gender-related means, standard deviations, and Cronbach's alphas for the scales of the personality-trait questionnaires (Sense of Coherence Scale SOC-13, Rosenberg Self-esteem RSE, Personal Attributes Questionnaire PAQ) and the Career Motivation Questionnaire scales (CMQ), ($n = 719$).

Scale	gender		p	Cronbach's Alpha
	females (n = 380) mean (SD)	males (n = 339) mean (SD)		
Personality traits				
SOC	5.02 (0.89)	5.08 (0.82)	0.32	0.84
RSE	2.32 (0.47)	2.38 (0.44)	0.08	0.85
PAQ-I	4.08 (0.68)	4.28 (0.66)	<0.001	0.74
PAQ-E	5.01 (0.50)	4.72 (0.59)	<0.001	0.74
Career motivation				
CMQ-I	6.07 (0.50)	6.10 (0.54)	0.36	0.68
CMQ-E	3.53 (0.87)	3.88 (0.85)	<0.001	0.69
CMQ-EC	4.45 (0.99)	4.22 (1.03)	<0.01	0.74
SOC	Sense of Coherence			
RSE	Rosenberg Self-esteem			
PAQ-I	Personal Attributes Questionnaire – instrumentality			
PAQ-E	Personal Attributes Questionnaire – expressiveness			
CMQ-I	Career Motivation Questionnaire – intrinsic career motivation			
CMQ-E	Career Motivation Questionnaire – extrinsic career motivation			
CMQ-EC	Career Motivation Questionnaire – extra-professional concerns			

Table 2

Topic of doctoral thesis (in progress/ already finished) of $n = 545$ students.

Topic of doctoral thesis	females n (%)	males n (%)	total n (%)
Literature review	5 (1.7)	3 (1.2)	8 (1.5)
Evaluation of therapeutic procedures (medical charts)	121 (40.8)	65 (26.2)	186 (34.1)
Experimental empirical study (Laboratory work)	80 (26.9)	107 (43.2)	187 (34.3)
Non-experimental empirical work (patient interviews or questionnaires)	47 (15.8)	28 (11.3)	75 (13.8)
Other	44 (14.8)	45 (18.1)	89 (16.3)
Total	297 (100.0)	248 (100.0)	545 (100.0)

Chi-square = 21.6, $p < 0.001$

Table 3

Choice of speciality of n = 407 students* (n = 231 females, n = 176 males).

Intended specialities	females n (%)	males n (%)	total n (%)
Primary care	31 (13.4)	20 (11.4)	51 (12.5)
Internal medicine	44 (19.0)	43 (24.4)	87 (21.4)
Surgery	26 (11.3)	63 (35.8)	89 (21.9)
Paediatrics	41 (17.7)	9 (5.1)	50 (12.3)
Gynaecology	32 (13.9)	4 (2.3)	36 (8.9)
Anaesthesiology	20 (8.7)	15 (8.5)	35 (8.6)
Psychiatry	13 (5.6)	7 (4.0)	20 (4.9)
Dermatology	11 (4.8)	3 (1.7)	14 (3.4)
Ophthalmology	9 (3.9)	5 (2.8)	14 (3.4)
Radiology	1 (0.4)	3 (1.7)	4 (1.0)
Others	3 (1.3)	4 (2.3)	7 (1.7)
Total	231 (100.0)	176 (100.0)	407 (100.0)

Chi-square = 62.9, p <0.001

* n = 2 missing pieces of data for type of speciality

The participants were also asked what factors influenced their choice of speciality. Female graduates considered the following factors significantly more important than males: short time for completing specialisation (p <0.001), and work with patients (p <0.01). Compared to females, male

graduates prioritised surgical (p <0.05) and high-technology work (p <0.001), research opportunities (p <0.001), high income (p <0.001), and prestige (p <0.01).

Influences of career status (doctoral thesis) and career planning

In a further step, a logistic regression analysis was conducted to find out what gender, personality traits, and career motivation contribute to the prediction of advanced status of thesis, decision as regards specialisation, and type of specialisation.

The backward stepwise logistic regressions (table 4) revealed that (1) there is a greater likelihood of being further advanced in the writing of the thesis if the subject is female, and if the student has higher scores in instrumentality and extrinsic career motivation; (2) the likelihood of having already chosen their speciality is higher in females, and in students with high self-esteem and high intrinsic career motivation; and (3) the likelihood of a student wishing to pursue a surgical specialisation is higher if the subject is male, and if the student has lower scores in extra-professional concerns.

Table 4

Determinants of prediction of advanced status of thesis, of having made the decision to specialise further, and of intending further specialisation in a surgical field, by logistic regression analyses (backward stepwise method).

	doctoral thesis n (yes) = 545		decision of further specialisation ¹ n (yes) = 409		type of further specialisation ² n (surgical) = 89	
	OR	(CI 95%)	OR	(CI 95%)	OR	(CI 95%)
Gender (f)	1.66	(1.15/2.38)	1.61	(1.17/2.20)	0.22	(0.13/0.38)
Personality traits						
– SOC	–	–	–	–	–	–
– RSE	–	–	1.09	(1.05/1.13)	–	–
– PAQ-I	1.61	(1.23/2.19)	–	–	–	–
– PAQ-E	–	–	–	–	–	–
Career motivation						
– CMQ-I	–	–	1.70	(1.21/2.38)	–	–
– CMQ-E	1.37	(1.10/1.70)	–	–	–	–
– CMQ-EC	–	–	–	–	0.47	(0.35/0.63)

¹ Choice and decision of further specialisation made (yes/no)

² Surgical speciality chosen (surgical/non-surgical speciality)

SOC Sense of Coherence

RSE Rosenberg Self-esteem

PAQ-I Personal Attributes Questionnaire – instrumentality

PAQ-E Personal Attributes Questionnaire – expressiveness

CMQ-I Career Motivation Questionnaire – intrinsic career motivation

CMQ-E Career Motivation Questionnaire – extrinsic career motivation

CMQ-EC Career Motivation Questionnaire – extra-professional concerns

Discussion

This paper reports on the data gathered from a survey of final-year medical students at the three medical schools in the German-speaking part of Switzerland. The participation rate of 71.6% was much higher than expected. Abele and Nitsche [1] reported a participation rate of 50% in a similar study. In the BMA 1995 cohort study [15] only

40% of the final-year medical students approached indicated their willingness to participate. The students were informed that this survey was the first wave of a longitudinal study, and that it was intended to reassess them as young physicians every two years throughout their residency.

Personality traits and career motivation

We found similar gender-related differences in the mean scale values for the personality-trait questionnaires, as well as in the career motivation questionnaire as reported by other authors [7, 13, 14]. Female medical students score higher on expressive variables that describe socially desirable, communal traits such as helpfulness, relationship consciousness, and empathy; they also have higher scores in regard to extra-professional concerns such as family responsibilities, convenient working hours, and job security. Male students score higher on variables that describe instrumental, agentic traits such as independence, decisiveness, self-confidence, activity. They also score higher on the scale of extrinsic career motivation, which describes the striving for promotion, income, and prestige.

Doctoral thesis and choice of speciality

Three-quarters of the participants had either written their doctoral thesis or were in the process of doing so. Women students were significantly further advanced with their theses. They chose therapy-oriented work significantly more often, while significantly more male graduates carried out experimental empirical work. The different preferences of female and male students as regards the topic of a doctoral thesis already indicate that female and male physicians are interested in different aspects of medicine.

By their final year of medical school, over half of the respondents had already made their choice of speciality. Similar findings are reported by other authors [16]. Significantly more female students had decided on the speciality in which they wished to receive further training. Women realise at an early stage of their training that they will come up against many barriers when attempting to combine a career in medicine with having a family [17]. Even during medical school, therefore, they begin to think about which medical specialities are appropriate for career patterns that include having a family. In women graduates' ranking of intended specialisation, internal medicine takes the top place, followed by paediatrics, gynaecology, and primary care. These specialities are to a large extent patient-centred, ie, the doctor-patient relationship plays a major role [18]. Women's choice of these specialities is influenced by gender schemas [19], which include an interest in working closely with patients. Another reason might be that it is easier to run a private practice or work part-time in these specialities, since working conditions are more flexible and more compatible with family responsibilities than in surgical fields. These considerations were reported in the focus group interviews conducted with a sub-sample of the study participants [20]. Although gynaecology entails long hours and a heavy surgical workload, a growing number of young female physicians are choosing this speciality. In the last ten years there has been a complete shift in gynaecology from a

male-dominated speciality to a predominantly female one. In Switzerland, for example, almost two-thirds of new diploma qualifications in gynaecology went to women in 2001 [3]. In Germany 46% of all gynaecologists and obstetricians are female [21]. This gender shift is due to growth in the attitude, arising in the late 1980s, that women should be treated by women physicians [22]. Young male physicians prefer surgical and high-technology specialities. Surgery is ranked in the top position by men, followed by internal medicine, primary care, and anaesthesiology. Surgery is a very prestigious and well-paid speciality, an aspect which is of greater importance to men than women. Similar trends in gender-distinct speciality distribution are reported by the BMA cohort study [15].

The unequal gender distribution in certain specialities might be explained either by gender-distinct speciality choice, or by gender-related restricted access to specialist training. Wetterer [23] theorised that women physicians often experience gender-relevant exclusion mechanisms that are not openly communicated, for example in surgical fields. There are no statistics for the number of female physicians starting specialist training in surgery, but changing their specialisation later on. In the EU and USA, fully qualified female surgeons are still a minority of up to 10% maximum [3, 4, 15, 24].

To summarise, the quantitative data, presented in this paper, and the findings of the focus group interviews [20] indicate that women and men aim at different career goals: Women want to complete their residency as quickly as possible, in order to be free to have the option of planning a family. This includes completing a doctoral thesis – a prerequisite for obtaining a speciality qualification in Switzerland. Women aim for a manageable medical field, and a speciality with few and foreseeable career obstacles. Men not only aspire to a speciality qualification, but also to a prestigious professional position. Their choice of speciality is not influenced by a consideration of potential obstacles.

Determinants of academic success and career planning

We used a regression model to test which variables might be predictive of academic success and a professional career. At the first measurement point, where the participants are to be found shortly before qualifying as doctors, women students and subjects with a high instrumentality and high extrinsic career orientation are more likely to have made greater progress with their thesis. Other than those mentioned above, possible reasons are that most female students are more conscientious (a phenomenon seen earlier in high school), and that male students have compulsory military service during breaks in the academic year, which leaves them less time to work on their thesis during medical school. The additional findings – that subjects of both genders who are more goal- and career-oriented have made greater progress

with their thesis – tally with the construct of the questionnaires.

The gender factor (being female) is again predictive of the second factor of the career-building process – choice and decision as to which speciality to enter – but high self-esteem, and in particular high intrinsic career motivation, play their part. Currently it is very difficult to obtain a residency contract in certain specialities, and students must apply two to three years before qualifying as doctors. Again, women seem to plan their specialist training even further in advance because of the time pressure they experience if they want to have a family at some point [20].

Many previous studies have argued that women are not fully integrated into the medical profession, with regard to either vertical or horizontal divisions [25, 26]. Gender differences in occupational orientation can partly be explained as a function of socialisation [19], but also by structural operating barriers or closure mechanisms within specific fields, mainly surgical specialities [23]. Gjerberg [27] demonstrated in a comparative study of two cohorts of Norwegian physicians that changes are taking place as far as horizontal segregation is concerned. The same development can be seen in other Western countries [3, 4, 15, 24].

According to our hypothesis in the regression model, the gender factor was also predictive of whether or not a surgical speciality was chosen. The likelihood of surgery being chosen is far

greater if the subject is male. Furthermore, respondents of both genders for whom extra-professional concerns such as family responsibilities or leisure time activities are less important, are much more likely to choose a surgical field. In this speciality, the assumption still applies that nothing but a commitment to more than a 100% workload will ensure success. Accordingly, the training conditions and organisational structure of the residency places correspond to the lifestyles of men and not women wishing to have a family.

In conclusion, our findings indicate that in the transition from medical school to specialist training, not only gender but also personality traits, as well as strong intrinsic and extrinsic career motivation, contribute to academic achievement and career planning. The longitudinal survey data, due to be gathered every two years from fall 2003, will show which factors foster and obstruct the subsequent career paths and living arrangements of young physicians.

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