

Gender Bias in Physicians' Management of Neck Pain: A Study of the Answers in a Swedish National Examination

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ABSTRACT

Background: Research has raised concerns about gender bias in medicine; that is, are women and men being treated differently because of gender stereotyped attitudes among physicians? We investigated gender differences in the diagnosis and management of neck pain as proposed in a written test. The design eliminated differences related to communication and patient behavior.

Methods: In a national examination for Swedish interns, using modified essay questions, the examinees were allocated to suggest management of neck pain in either a male or a female bus driver with a tense family situation. The case description was identical with the exception of patient gender. The open answers were coded for analysis. Two hundred thirty-nine interns (41% women) participated. Chi-square-tests were used to measure differences in proportions, and *t* test was used to evaluate differences in means.

Results: In certain areas, significant gender differences were detected. Proposals of non-specific somatic diagnoses, psychosocial questions, drug prescriptions, and the expressed need of diagnostic support from a physiotherapist and an orthopedist were more common with females. Laboratory tests were requested more often in males. Both male and female physicians contributed to the gender differences. When assessing the impact of the patient-doctor relationship for health outcome, male physicians underlined the importance of patient compliance foremost in female patients, and female physicians did the opposite.

Conclusions: The results suggest that physicians' gendered expectations are involved in creating gender differences in medicine. The inclusion of gender theory and discussions about gender attitudes into medical school curricula is recommended to bring about awareness of the problem.

INTRODUCTION

IN THE PAST DECADES, attention has been paid to evidence that women are not offered the same medical treatment as men.¹ For example, in coro-

nary artery disease, renal failure, and knee joint arthrosis, men are more extensively examined and treated compared with women with the same severity of symptoms.¹⁻³ Research indicates that physicians are more likely to interpret men's

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symptoms as organic and women's as psychosocial,^{4,5} and female patients are assigned more diagnoses of nonspecific symptoms and signs.³ Women are also prescribed more psychoactive drugs than are men.^{6,7} Comparisons of medical students' performances on tests with standardized patients show that both male and female students achieve higher test results in the male cases, indicating that male patients are taken more seriously.⁸ According to a recent review, there is a need to investigate the management of health problems not previously studied, as different diseases may show disparate patterns of gender differences.⁹

Thus, gender plays an important but not necessarily appropriate role in medical decision making. The issue of gender bias is raised; that is, are gender differences in medical management a result of physicians' unconsciously gendered social attitudes, preconceptions, and stereotypes?¹ In the clinical situation, it is often hard to know to what extent gender differences reflect gender bias or other patient, physician, or communication characteristics related to gender.^{3,9} For example, the biological differences between men and women might indicate that the type and severity of symptoms vary, explaining the differences in treatment.¹⁰ Patients' wishes and communication behavior are other suggested causes of the gender differences in the medical process.^{11,12} It is argued that men describe their symptoms in a straightforward and demanding way, whereas women often give vague symptom descriptions and are hesitant to accept potentially dangerous measures, such as surgery.²

The gender differences in treatment might also depend on aspects of the physician beyond gendered preconceptions. Studies comparing male and female physicians suggest differences in communication and consultation behavior, with female physicians being less dominating and giving the patients more time.¹³⁻¹⁵ However, there is less evidence about differences between male and female physicians in medical decision making. The research results are inconsistent and the differences found are small.^{14,16,17}

In studies of differences between men and women, it is important to clarify the concepts of sex and gender and define the gender perspective applied. Sex refers to biological characteristics and chromosomes, and, thus, sex is often seen as definite and given. Gender, on the other hand, looks on men and women from a psychological,

social, and cultural perspective.^{15,18} What does it mean to be a man or a woman in a certain society? What is regarded as proper to say and do? However, when studying activities, behavior, and health in men and women, it is usually not possible to know to what extent a certain phenomenon is biological or social in origin. A constructivistic perspective of gender is then appropriate because it underlines that biology and culture, sex, and gender are related and interdependent and that what gender implies is continuously being negotiated, accepted, rejected, or changed in social interaction.¹⁵

The purpose of this study was to investigate gender differences in the suggested diagnosis and management of neck pain in a theoretical examination for Swedish medical interns. We chose neck pain because it is a common health problem in men as well as women and because there is a lack of knowledge about gender differences in the medical management of neck pain. By using paper cases and written answers, we eliminated gender differences caused by patient behavior and interaction between doctor and patient and focused on the physicians' preconceptions and unconscious values. A constructivistic gender perspective was used.

The research questions were: Did the suggested diagnosis and management differ in relation to the case gender? Did men and women physicians differ in their suggested diagnosis and management?

MATERIALS AND METHODS

National examination

After finishing university studies, medical students in Sweden work as AT-physicians (corresponding to interns in the United States and pre-registration house officers in the U.K.) for 2 years. This period ends with one written examination and one practical one. The AT-physician can thereafter apply for registration as a fully licensed medical practitioner. The written examination is national, given on a certain day at nine different locations four times a year. Each time, 220-300 examinees usually participate. Modified essay questions are used,¹⁹ and the examination procedure is as follows. Each examinee is given a written case description, followed by one or two open-ended questions. When the answers on the

first questions are handed in, the examinee receives new information about the case and then additional questions.

Data collection

In the national examination in May 1996, a research case was designed. The examinees were allocated to assess neck pain in either a male or a female bus driver with a tense family situation. The case description was identical, with the exception of patient gender. The examinees did not know that the assigned gender of the patient was of specific interest. The male case was distributed at three examination places and the female case at the other six. (See Appendix for the case description and questions.) The answers were made anonymous and were blinded regarding the age and gender of the examinee.

Participants

Two hundred thirty-nine AT-physicians participated in the examination, 59% ($n = 141$) men and 41% ($n = 98$) women, and all answered the questions in the research case. The age of the physicians varied between 26 and 56 years, the mean age for men being 33.0 and for women 33.1 years. The allocation of cases resulted in 56% of male and female physicians receiving a male case and 44% receiving a female case.

Analysis

Creating a Coding Schedule. First, 12 examinations were randomly chosen and independently analyzed by the four researchers with regard to content. Prior knowledge about gender disparities in healthcare guided us when constructing the variables (e.g., as men's symptoms are more likely than those of women to be interpreted as somatic, we outlined variables that differentiated somatic and psychosocial diagnoses).

Another 12 examinations were then coded according to the preliminary schedule, and the variables were discussed and modified. A coding schedule of 72 variables was thus constructed. The variables were mainly treated as nominal (e.g., Were questions asked or not about working conditions in the history taking?). The proposed diagnoses in question A (Appendix) were counted and categorized into (1) well-defined somatic diagnoses (e.g., arthrosis, rupture of tendon, or disc hernia), (2) well-defined psychiatric

diagnoses (depression was the only acknowledged psychiatric diagnosis proposed), (3) non-specific symptom diagnoses (such diagnostic entities as fibrositis, myalgia, and tendinitis), and (4) psychosocial diagnoses (diagnostic entities and proposed explanations relating the symptoms to environmental, social, or psychological conditions, e.g., work overload, stress, family problems, and drug-related symptoms).

Main Coding. All examinations were randomly sorted into four lots, and each researcher coded one lot.

Reliability of the Coding. Twelve randomly chosen examinations were recoded by the three researchers who had not been the prime coder. Twenty-six interpretation discrepancies, because of vagueness in the meaning of the answer, were identified. Thirty reading discrepancies, caused by difficulties in understanding the physician's handwriting or by not seeing what was in fact clearly written, were also identified.

An estimation of interresearcher reliability was calculated for the 12 examinations, each with 72 variables. As each interpretation problem concerned one or several of the researchers, we calculated per examination: $26 / (72 \times 12) = 3.0\%$. The reading problems concerned only one researcher at a time, and, therefore, the researcher was included in the denominator of this calculation: $30 / (72 \times 12 \times 4) = 0.9\%$. We identified reliability problems concerning interpretation in 3% of the variables and reliability problems concerning reading in 1%.

Statistical analysis

The analysis of gender differences in the number of proposed diagnoses was based on the calculation of means. To study gender differences in the nominal variables, the outcome in each individual variable was compared between male and female cases and male and female physicians, and also the gender differences made by male and female physicians, respectively. Individual variables, measuring similar aspects, were computed into new variables. Pearson's chi-square test was used to test the gender differences in proportions, and a t test was used to check the differences in means. All tests were two-sided. A p value < 0.05 was chosen as significant. Close to significant p values ($p < 0.1$) are also presented in the tables.

Multiple logistic regression analyses were made to assess the association between a binary outcome and the four gender combinations (male or female examinee/male or female case) and also to control for the impact of age on the results. The nominal variables in questions B–F (Appendix) were summarized and classified according to whether they measured somatic or psychosocial aspects. Based on these classified variables, the following eight outcomes were constructed for the regression analysis: somatic and psychosocial total, somatic and psychosocial history taking, somatic and psychosocial investigations and treatments, and somatic and psychosocial overall assessments. Each outcome was dichotomized at the 75th percentile in such a way that those above the 75th percentile were coded 1 and those below were coded 0. To control for age, it was dichotomized, <36 years ($n = 174$), and ≥ 36 ($n = 65$), and added to the regression analysis. To evaluate the results of the multiple logistic regressions, 95% confidence intervals (95% CI) were used.

The statistical calculations were conducted in SPSS 6.1 (Mac) (Chicago, IL).

RESULTS

Differences in relation to case gender

The comparisons between outcome in the male and female case are presented at left in Tables 1, 2, 3, and 4. Nonspecific symptom diagnoses, such as myalgia and tendinitis, were significantly more often assigned to the female case (Table 1). In the other diagnostic groups, there were no significant differences in relation to case gender.

A consistent pattern was shown in history taking (Table 2). There were higher percentage scores in all the psychosocial variables in the female case. The greatest difference concerned the family aspects, which were in total attended to in 61% of the female cases and 37% of the male.

Regarding investigations and treatments, laboratory tests were suggested more often in the male case (Table 3). Diagnostic referral to a physiotherapist and an orthopedist as well as prescriptions for drugs (painkillers and psychoactive drugs) were more often suggested in the female case.

Once the diagnosis of cervical disc hernia was

established (Table 4), there was a pattern in which psychosocial factors and aspects of the patient-doctor relationship showed higher percentage scores in the female case. Concerning the situation at work, the difference reached a statistically significant level.

Differences in relation to physician gender

We analyzed the differences made by male and female physicians separately. Female physicians proposed significantly more diagnoses in the female case, primarily in the nonspecific symptom diagnoses category, whereas male physicians were more consistent (Table 1). Numerically, men proposed more well-defined diagnoses in the male case and more nonspecific symptom and psychosocial diagnoses in the female case. Comparing the outcome in relation to physician gender in the male and female case separately, the numbers of proposed nonspecific symptom and psychosocial diagnoses were higher in the female case when assessed by female compared with male examinees.

In history taking (Table 2), differences appeared foremost in the psychosocial variables. Overall, a larger proportion of the female compared with the male physicians asked psychosocial questions. Male physicians asked more about work aspects in total and family aspects in total in the female case. They also asked more specific questions about domestic duties and the psychosocial situation in the family in the female case. The gender differences made by female physicians in history taking were less pronounced. In the female case, questions about the physical workload were posed by 42% of the female examinees compared with 26% of the male. Such a large difference in relation to examinee gender was not seen for the male case.

Regarding investigations and treatments (Table 3), both male and female physicians ordered laboratory tests to a larger extent in the male case, but the difference reached significance only for female examinees in laboratory tests that had to be sent to an external laboratory. Physicians of both genders proposed diagnostic referrals to physiotherapists and orthopedists, as well as drug prescriptions, more often in the female case. In the male case, extensive physical examinations and diagnostic referrals to physiotherapists were suggested significantly more often by female than male physicians.

TABLE 1. MEAN (SD) NUMBER OF DIAGNOSES PROPOSED IN DIFFERENT DIAGNOSIS GROUPS BY GENDER OF CASE AND PHYSICIAN

Diagnosis group	Case		Male physician		Female physician		p				
	Male	Female	Male case	Female case	Male case	Female case	MPI ^a	FPI ^b	MC ^c	FC ^d	
	134	105	79	62	55	43					
n = 239											
Well-defined somatic	2.0 (1.3)	1.9 (1.3)	2.2 (1.3)	1.9 (1.3)	1.8 (1.2)	1.9 (1.2)	0.195	0.919	0.124	0.915	
Well-defined psychiatric	0.1 (0.5)	0.1 (0.3)	0.2 (0.4)	0.1 (0.2)	0.1 (0.6)	0.1 (0.3)	0.130	0.611	0.942	0.592	
Nonspecific symptom	1.2 (1.0)	1.6 (1.3)	1.2 (0.9)	1.4 (1.3)	1.2 (1.1)	1.9 (1.2)	0.275	0.003	0.904	0.057	
Psychosocial	1.0 (0.7)	1.1 (0.7)	0.9 (0.7)	1.0 (0.6)	1.1 (0.8)	1.3 (0.8)	0.331	0.234	0.188	0.073	
Total	4.4 (1.9)	4.7 (2.0)	4.5 (1.9)	4.4 (2.1)	4.2 (2.0)	5.1 (1.7)	0.816	0.025	0.438	0.076	

^aMPI, *p* value when comparing male physicians' assessments of the male and female case.
^bFPI, *p* value when comparing female physicians' assessments of the male and female case.
^cMC, *p* value when comparing male and female physicians' assessments of the male case.
^dFC, *p* value when comparing male and female physicians' assessments of the female case.
^eSignificant (*p* < 0.05) and close to significant (*p* < 0.1) *p* values are bold.

TABLE 2. HISTORY TAKING. DID THE FOLLOWING ASPECTS OCCUR?^{a,b}

	Case		Male physician				Female physician				MPC ^c		FPF ^d		MC ^e		FC ^f		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	χ^2	P	χ^2	P	χ^2	P	χ^2	P	
			case	case	case	case	case	case											
Somatic aspects																			
Actual problems	95	91	96	89	93	93	93	2.96	0.09 ^g	h	1.0	0.45	0.55	0.46					
Hereditary	59	51	60	53	58	49	58	0.56	0.46	0.85	0.35	0.88	0.20	0.66					
Earlier health	78	84	76	82	80	86	86	0.86	0.36	0.62	0.43	0.58	0.27	0.60					
Trauma	50	58	50	55	50	62	62	0.48	0.52	1.83	0.18	0.98	0.66	0.42					
Headache	37	37	37	40	38	33	33	0.19	0.66	0.33	0.56	0.86	0.66	0.42					
Medication	72	76	73	73	69	81	81	0.08	0.78	1.92	0.17	0.48	1.09	0.30					
Psychosocial aspects																			
Stress	25	31	25	29	24	35	35	0.24	0.62	1.50	0.22	0.82	0.40	0.53					
Work aspects total	68	79	63	77	75	81	81	3.27	0.07	0.65	0.42	0.17	0.24	0.62					
Specified physical load	30	32	27	26	36	42	42	0.01	0.92	0.31	0.58	0.23	2.99	0.08					
Specified psychosocial factors	40	50	35	48	46	51	51	2.40	0.12	0.32	0.58	0.24	0.08	0.78					
Family aspects total	37	61	32	61	44	61	61	12.35	0.000	2.74	0.098	0.16	0.01	0.93					
Specified domestic duties	6	11	4	11	9	9	9	2.96	0.09	0.00	0.97	0.27	0.11	0.74					
Specified psychosocial factors	10	19	10	23	11	14	14	4.09	0.04	0.21	0.65	0.88	1.23	0.27					
Leisure time	25	26	27	24	24	28	28	0.10	0.75	0.23	0.63	0.70	0.18	0.67					
Risk (tobacco, drugs)	49	51	50	48	49	56	56	0.01	0.91	0.44	0.51	0.98	0.56	0.45					
Sick-leave experiences	8	9	8	10	7	7	7	0.19	0.66	h	1.0	0.94	0.24	0.63					
<i>n</i> = 239	134	105	79	62	55	43	43												

^aGiven as percentage.

^b*df* = 1 in all tests in this table.

^cMPh, χ^2 and *p* value when comparing male physicians' assessments of the male and female case.

^dFPF, χ^2 and *p* value when comparing female physicians' assessments of the male and female case.

^eMC, χ^2 and *p* value when comparing male and female physicians' assessments of the male case.

^fFC, χ^2 and *p* value when comparing male and female physicians' assessments of the female case.

^gSignificant (*p* < 0.05) and close to significant (*p* < 0.1) *p* values are bold.

^hMore than 2 cells had expected counts < 5. The *p* value calculated using Fisher's exact test.

TABLE 3. PROPOSED INVESTIGATIONS AND TREATMENT MEASURES^{a,b}

	Case		Male physician				Female physician				MPT ^f		FPT ^d		MC ^e		FC ^f	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	n	n	case	case	case	case	case	case	case	case	χ ²	P	χ ²	P	χ ²	P	χ ²	P
Extensive physical examination ^g	69	71	61	68	82	79	0.73	0.39	0.38	0.54	6.77	0.009 ^h	1.01	0.32				
Laboratory tests																		
Local external	98	91	98	92	98	91	0.03	0.03	4.95	0.03	2.25	0.13	i	0.17	i	1.0	0.05	0.82
Diagnostic referrals	51	39	48	45	55	30	0.07	0.07	3.24	0.07	0.12	0.73	5.79	0.02	0.54	0.46	2.38	0.12
Ordinary x-ray	88	87	89	89	87	84	0.75	0.75	0.10	0.75	0.00	0.99	0.25	0.62	0.06	0.82	0.55	0.46
Advanced technical ^j	32	26	35	40	33	23	0.28	0.28	1.16	0.28	0.30	0.59	1.06	0.30	0.02	0.90	0.23	0.63
Physiotherapist	25	35	19	29	35	44	0.098	0.098	2.74	0.098	1.96	0.16	0.96	0.33	4.14	0.04	2.55	0.11
Orthopedist	31	41	35	40	24	42	0.096	0.096	2.77	0.096	0.35	0.55	3.71	0.05	2.13	0.15	0.03	0.88
Treatment measures																		
Work oriented	30	22	34	19	24	26	1.92	0.17	1.92	0.17	3.81	0.05	0.05	0.82	1.72	0.19	0.58	0.45
Family oriented	9	5	11	5	6	5	1.57	0.21	1.57	0.21	1.91	0.17	i	1.0	1.40	0.24	i	0.10
Referral to physiotherapist	95	94	94	95	96	93	0.03	0.87	0.03	0.87	0.14	0.70	i	0.65	i	0.36	i	0.69
Referral to orthopedist	5	5	4	5	7	5	0.03	0.87	0.03	0.87	i	1.0	0.29	0.59	i	0.44	i	0.10
Sick-listing	40	47	41	42	40	54	0.97	0.32	0.97	0.32	0.03	0.86	1.77	0.18	0.03	0.95	1.36	0.24
Drug prescription ^k	82	92	80	90	86	95	5.38	0.02	5.38	0.02	2.95	0.09	2.57	0.11	0.72	0.40	0.91	0.34
	134	105	79	62	55	43												

^aGiven as percentage.

^bdf = 1 in all tests in this table.

^cMPh, χ² and p value when comparing male physicians' assessments of the male and female case.

^dFPh, χ² and p value when comparing female physicians' assessments of the male and female case.

^eMC, χ² and p value when comparing male and female physicians' assessments of the male case.

^fFC, χ² and p value when comparing male and female physicians' assessments of the female case.

^gMore than 4 of 6 examinations proposed.

^hSignificant (p < 0.05) and close to significant (p < 0.1) p values are in bold.

ⁱMore than 2 cells had expected counts < 5. The p value calculated using Fisher's exact test.

^jMRI, EMG, ultrasound.

^kPainkillers and psychoactive drugs.

TABLE 4. FACTORS PHYSICIANS CONSIDERED MOST IMPORTANT FOR HEALTH OUTCOME IN A CASE OF CERVICAL DISC HERNIA^{a,b}

	Case		Male physician				Female physician				MPC ^c		FPH ^d		MC ^e		FC ^f		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	χ^2	P	χ^2	P	χ^2	P	χ^2	P	
			case	case	case	case	case	case	case	case									
Psychosocial factors																			
Family situation	35	41	33	42	39	40	3.84	0.05	1.22	0.27	0.02	0.89	0.40	0.53	0.06	0.81			
Working situation	55	71	54	69	56	72	2.13	0.15	3.25	0.07	2.57	0.11	0.05	0.86	0.09	0.76			
Stress	32	41	30	37	35	47	2.01	.16	0.71	0.40	1.44	0.23	0.26	0.61	0.93	0.34			
Patient-doctor relationship																			
Patient compliance	43	49	37	53	53	42	0.66	0.42	3.84	0.05	1.14	0.29	3.39	0.07	1.31	0.25			
Doctor's support	24	32	28	29	18	37	2.13	0.15	0.02	0.87	4.48	0.03	1.66	0.20	0.76	0.38			
Medical measures																			
Sick-listing	28	24	30	25	26	23	0.44	0.51	0.42	0.51	0.06	0.80	0.22	0.64	0.01	0.91			
Drug prescription	34	34	43	36	22	33	0.00	0.99	0.83	0.36	1.43	0.23	6.48	0.01	0.10	0.76			
Referrals for treatment	62	56	65	52	58	63	1.03	0.31	2.91	0.09	0.21	0.64	0.81	0.37	1.29	0.26			
<i>n</i> = 239	134	105	79	62	55	43													

^aGiven as percentage.^b*df* = 1 in all tests in this table.^cMPh, χ^2 and *p* value when comparing male physicians' assessments of the male and female case.^dFPh, χ^2 and *p* value when comparing female physicians' assessments of the male and female case.^eMC, χ^2 and *p* value when comparing male and female physicians' assessments of the male case.^fFC, χ^2 and *p* value when comparing male and female physicians' assessments of the female case.^gSignificant (*p* < 0.05) or close to significant (*p* < 0.1) *p* values in bold.

Both male and female physicians mentioned the working situation as important for the prognosis more often in the female case (Table 4). The difference was close to significant for male physicians. Regarding aspects of the patient-doctor relationship, an opposite gender pattern was shown. Male physicians underlined the worth of patient compliance significantly more often in the female case, whereas female physicians stressed it more often in the male case. Female examinees highlighted the importance of a supporting doctor more often when the patient was a woman. In the male case, male physicians mentioned the importance of drug prescription significantly more often than female physicians.

In the multivariate logistic regression analyses, the combination male physician/male case was used as reference. The eight binary somatic and psychosocial outcomes described in Materials and Methods were the dependent variables. Significant associations were found only for psychosocial history taking. The female physician/female case combination was a strong determinant for high outcome in the psychosocial history taking odds ratio OR 2.74, CI 1.25-6.06. Adding age to the regression model did not change this association. In the extended model, the OR for the psychosocial history taking in the female physician/female case combination was OR 2.79, CI 1.26-6.24.

DISCUSSION

The current study investigated proposed diagnoses and management of neck pain in a male or female patient on paper. Nonspecific symptom diagnoses, psychosocial questions, drug prescriptions, and the expressed need of help from a physiotherapist and an orthopedist in the diagnostic process were more frequent in the female case. Laboratory tests were more common in the male case. Both men and women examinees made gender differences. According to psychosocial history taking about family and work, the gender differences made by male physicians were greater. Female physicians made greater differences in the types of diagnoses and laboratory tests proposed. Concerning the assessments of the patient-doctor relationship, male physicians underlined patient compliance as important for recovery foremost in the female case, and the female examinees

more often mentioned the importance of patient compliance in the male case. Furthermore, women examinees seemed to take a larger responsibility for the patient in the female case, underlining the importance of the doctor's support for health outcome.

Sweden is known for far-reaching gender equality.²⁰ There are laws and strong norms in society that men and women should be treated equally and receive the same opportunities in all fields, including healthcare. Furthermore, all inhabitants are covered by public health insurance ensuring that the majority of an individual's medical costs are covered by the state. Accordingly, most doctors do not tend to treat men and women differently if the patients' problems are the same.

In this light and because the examination tested theoretical knowledge and what the physicians knew they ought to do, it is surprising that gender differences were found. Despite identical symptoms and problems, both male and female examinees proposed different diagnoses and managements depending on case gender. It is often believed that gender differences arise in clinical communication,^{2,9} and our data give strong indication that gender differences in medical management also derive from physicians' gender bias.

On method

This study analyzed gender differences in a written examination, which implied testing theoretical knowledge and competence.²¹ The doctors were trying to do their best to pass the examination and wrote what they believed was the right thing to do. The patient was a paper case and not a real person who could interact and influence management. The test situation was, therefore, a situation where the gender differences should be minimized and due only to the physicians' gender preconceptions. There probably would have been wider gender differences if we had designed a study with standardized patients or real patients in clinical practice. In such studies, however, it is difficult to determine whether the disparities are related to the doctor's knowledge and preconceptions, the patients' behavior, or the communication between doctors and patients.^{1,22} Furthermore, as there is no scientific consensus that neck pain and cervical disc hernia should be managed differently in women and men with identical symptoms, all differences found in this

study might be considered inappropriate and gender biased. They were the result of preconceptions and ideas emanating from the doctors' minds only.

The use of open-ended, modified essay questions was a strong point because such a test resembled the clinical situation more than other written tests.^{19,23} The examinees were not given hints about how to answer but defined what they saw as relevant to mention and do. They were not reminded to consider gender aspects, and, thus, the differences emerged without any trigger mechanisms other than the assigned gender of the patient.

A problem with the open-ended design was that the answers were more complicated and time consuming to analyze compared with multiple choice alternatives or Likert scales. The systematic construction of variables that were easy to identify and code was important for the thrustworthiness of the study. The test of reliability in the coding process also revealed a good agreement between the individual researchers.

It would have been ideal to have the male and female cases distributed within the same testing center, but this was not feasible. We looked for differences in the examinees' responses correlating with which medical school or testing center they had attended (indicating that gender-related attitudes might be different in different geographical regions), and such differences could not be detected.

Gender differences in medical management have been investigated by comparing examination scores.^{8,22} These studies have shown inconsistent results, and the design has some limitations. Because medical traditions and treatment guidelines are sometimes blind to gender,³ there might be gender differences hidden in similar scoring. In Sweden, for example, it has been shown that women with cardiac insufficiency were offered cheaper and older drugs than men with corresponding symptoms.²⁴ Even if a cheap drug is proper according to guidelines, it is nevertheless worth considering the reasons for, and the effects of, gender differences.

Few significant differences were found when comparing the outcome in the male and female cases. (Even fewer differences were found when comparing the outcome in male and female physicians; data not shown.) Most differences were detected when comparing management of the male and female cases by male and female physicians,

respectively. This calls attention to a crucial methodological and theoretical issue in research on gender differences: What perspective on gender is applied? In a constructivistic perspective on gender, as used here, gender is regarded as continuously performed and created in interaction with others.¹⁵ Consequently, the others, those interacting with the studied subjects, have to be included in the analysis. To analyze differences in the treatment of male and female patients without considering physician gender means that gender differences in physicians' behavior is neglected. On the other hand, to analyze physicians' decision making without considering patient gender means that physicians' gendered behavior is seen as inherited and essential rather than contextual and interactional. As illustrated in the tables, important knowledge might then be missed.

On findings of gender-biased management

One might argue that because women carry the main burden of housework and child care, it was appropriate for the doctors to ask about the family situation more often in the female case. It might be understandable but hardly appropriate. The individual patient has the right to be seen as unique and not as representative of a group. Furthermore, in good clinical practice, history taking about daily life in the family and at work is a prerequisite.^{25,26} As described in the Appendix, this paper case, whether male or female, had a very tense family situation, with economic problems and where the spouse was being threatened by redundancy. In such a situation, the patient is certainly affected by the problems to some extent, and it is important that the physician consider that. Research has shown that most patients with psychosocial problems will disclose them to the doctor when asked.²⁷ Not to ask might be seen as an act of neglect and probably contributes to somatization of problems as the doctor signals what areas are proper to discuss.²⁸

There were evident inconsistencies in the management of psychosocial aspects in the examinations. Although the situations in the family and at the workplace were attended to more often in the female case during history taking, the pattern was different for the measures proposed. Family-oriented measures were, on the whole, seldom actualized, and the proportion of work-oriented measures was higher in the male case. How can this be understood? Women's illnesses tradition-

ally have been regarded as related to psychosocial factors and difficulties in combining multiple roles in the family and at work, whereas men's employment and role as breadwinner have been taken for granted.²⁹ Such attitudes might have stimulated history taking about family and work more in the female than in the male case. When the examinees during the test received information about the patient's difficulties at home and at work, another pattern emerged. Only a few physicians suggested any family-oriented measures, such as a follow-up with the spouse or a referral to a social worker. This was probably because the family is considered a private area. The fact that work-oriented measures were mentioned more often in the male case indicates that wage work is regarded as a more important part of men's lives than of women's lives. This is in line with research on work-oriented rehabilitation that has shown that male patients are offered more rehabilitation resources and have returned to work to a larger extent when sick-listed.^{30,31}

According to previous research, physicians prescribe more drugs for female patients.^{7,32} This might be related to the fact that women, more than men, suffer from diseases that are appropriate to treat with drugs or that they demand drugs to a larger extent than men. This study gives support to a hypothesis of gender bias. Physicians, men and women, are more prone to offer drugs to female patients than to males with the same symptoms (Table 3). Research on the clinical management of, for example, heart, kidney, and Parkinson's disease has shown evidence for a bias favoring men's access to advanced technical investigations, operations, and expensive medicine.^{1,33} Notwithstanding that laboratory tests were ordered more often in the male case, such a pattern was not evident in this study. For example, male physicians proposed advanced technical investigations more often in the female case, and the most common treatment was physiotherapy in all four case/physician combinations.

In this study, more nonspecific preliminary diagnoses were proposed in the female case. This might be explained by the fact that women patients are often considered as describing their symptoms in a more diffuse way than men, making it hard for the doctor to understand and arrive at a diagnosis.^{18,34,35} Can such ideas also explain why the examinees suggested a diagnostic referral to a physiotherapist and an orthopedist more often in the female case? Did they interpret the case de-

scription as more diffuse and unclear in the female case, thereby feeling that they needed a second opinion to establish the diagnosis?

The importance given to patient compliance and doctor's support (Table 4) showed that men and women physicians had different expectations and demands in relation to patient gender. Whether such preconceptions are diminished or exaggerated in real consultations is concerned with the patient's and physician's way of relating to gender, for example, in behavior, speech, and dressing.¹⁵ Most consultation research has been restricted to differences between men and women physicians, on the one hand, or men and women patients, on the other.⁹ In one study comparing the four gender combinations of physician/patient, consultations between female physicians and female patients were the most free of conflict, supportive, and egalitarian.¹³ Interactions between female physicians and male patients were the most complex and psychologically demanding, whereas consultations between male physicians and male or female patients were somewhere in between. In an examination study on standardized patients, the students performed worse on symptoms presented by a patient of the opposite gender.³⁶ In a qualitative consultation study, male physicians were hardly interrupted by patients when speaking, whereas female physicians were interrupted by male patients.³⁷ Research thus indicates that opposite gender consultations are more complicated, which might also explain why the examinees underlined the importance of a compliant patient more in the opposite gender case.

Gender bias is a complex phenomenon. According to Ruiz and Verbrugge,³ it can arise from two views, one assuming equality where there are genuine differences and the other assuming differences where none exist. This is true on a population level, and on the individual patient level, there are additional aspects to consider. The differences seen in studies between individual men in a male population or between individual women in a female sample are regularly greater than the differences between groups of men and women.³⁸ This means that once knowledge about gender differences in a certain condition has been established, it might, in fact, be the cause of discrimination toward individual patients because "the problem with generalizations is that they do not apply to particulars."³⁹ It is usually very easy to identify who is a man and who is a woman

and thereby risk assigning group characteristics to an individual without reflection, that is, risk making gender-biased assessments.

CONCLUSIONS

This study of the answers to a written examination suggests that physicians' gender stereotyped expectations are involved in creating gender differences in medicine. To reduce gender bias, the awareness of values and attitudes to gender has to increase within the medical society. To include gender theory and discussions about gender attitudes into medical school curricula is one possible approach to tackling the problem. Another way is to give senior physicians opportunities to reflect continuously on gender and other non-medical influences in medical decision making.

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APPENDIX: MALE/FEMALE CASE VERSION

Sivert/Siw Jonsson is a 34-year-old bus driver who consults you at a health center in a small town. Twenty minutes are allocated for the consultation. Mr./Mrs. Jonsson complains about pain that started in the left shoulder a couple of months ago. It is still most painful in the left shoulder, but now there is also pain in the right shoulder and neck. Mr./Mrs. Jonsson describes sleeping problems. It is hard to find a proper sleeping position, causing the patient to wake up each time he or she tries to turn around in the bed. Furthermore, the pain is there all day, and sometimes there is pain even in the left arm. The patient has problems at work and stayed at home last week, having signed himself or herself off sick. Now, to be able to continue the sick-listing, he or she wants a medical certificate to show at the social insurance office. The last time Mr./Mrs. Jonsson consulted you half a year ago, he or she complained about headache.

Question A: Based on the information you have, which diagnoses might be considered?

Question B: What questions do you want to pose to this patient?

When turning in the answers to questions A and B, the examinees were informed that Siwert/Siw Jonsson was married, with two children of preschool age. The family situation was tense, with worries about the family economy and the wife or husband being threatened by redundancy. At work, Mr./Mrs. Jonsson drove the bus in the town during days, evenings, and weekends. No heavy goods were involved. He or she did not smoke and drank alcohol only a few times a year. The patient often woke up in the morning with severe pain in the left arm, and it was hard to turn the steering wheel or to turn the head to look back. Mr./Mrs. Jonsson has worried about cancer, as a close relative died of bone cancer.

Question C: What physical examinations do you want to conduct?

Question D: Do you want to propose any laboratory tests or referral studies? If so, which?

Question E: What treatments and measures do you recommend?

Before the last question, the examinees were informed that the studies performed revealed a reduced rotation to the left in the neck, tender muscles in the shoulder, neck, and back of the head, tender facet joints in the neck, and reduced sensibility in the forth and fifth finger of the left hand. They were also told that a plausible cause was a cervical disc hernia.

Question F: Which factors would you assess as crucial for the patient's recovery?

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