

Sex Differences in Health Problems, Diagnostic Testing, and Referral in Primary Care

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BACKGROUND. The aim of the study was to investigate sex differences in health problems and in the use of referrals for additional diagnostic procedures, specialists, and paramedical care in the primary care setting.

METHODS. Data stored from 1988 to 1992 by the continuous morbidity registration project of the department of general practice at Nijmegen University were used. The study population consisted of about 60,000 general practice male and female patients of all ages. Recorded health problems, diagnostic investigations, and referrals to specialists were assessed and analyzed. Health problems were categorized into diagnostic rubrics according to the International Classification of Health Problems in Primary Care (ICHPCC-2).

RESULTS. Women presented with more health problems (2286 vs 1598 per 1000 patients per year) and made greater use of secondary medical care (603 vs 376 referred diagnoses per 1000 patients per year) than men, especially in the age group of 25 to 44 years. The category of screening and health education accounted for more than 30% of the sex difference with reference to the diagnostic rubrics overall. When this category was combined with obstetrical diagnoses (9.4%) and diseases of the genitourinary system (18.1%), 60% of the sex difference between men and women was accounted for. Over 60% of the higher overall use of secondary medical care by women was in the prevention and health education category. Mental disorders did not play a major role in the greater overall use of medical care by women.

CONCLUSIONS. Screening tests and health education play a major role in the greater number of health problems presented by women in primary care and in the greater use of additional diagnostic procedures.

KEY WORDS. Sex characteristics; episodes of care; referral; primary care; women's health. (*J Fam Pract* 1996; 43:567-576)

The World Health Organization (WHO) program "Health for All by the Year 2000" has stimulated research into differences in morbidity and medical care utilization in the last few years. In a report on women's health and human rights, WHO has paid special attention to the protection and promotion of women's health.¹

Extensive research on sex differences has shown that women have higher rates of morbidity and utilize medical care more than men.^{2,8} Despite higher morbidity, mortality for women is lower.^{2,4,8,9} Nathanson has stated: "Women get sick, men die."⁸

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In the Netherlands, comparable sex differences in morbidity, medical care utilization, and mortality have been found.^{2,10} Such findings might lead to the conclusion that "women are the sicker sex."

Although research has revealed evidence for the presence of sex differences in morbidity and medical care utilization in general, the relation between sex and the specific types of morbidity and health problems is still not clear. Explanations have been sought first in the biological differences and then in sociocultural and psychological differences between men and women.^{7,11,12}

Sex differences in morbidity due to biological sex are related to pregnancy, delivery, and problems with reproductive organs, and morbidity inherent in the greater life expectancy of women. Some believe that the health complaints of women that suggest women are the sicker sex are of psychological origin,³ implicit, for example, in the risks women run

and differences in lifestyle,^{3,4,6,7} and in their illness behavior, ie, women's perception of symptoms, assessment of symptoms' importance, and their readiness to take actions concerning them.¹³ Finally, explanations for the higher rate of female morbidity have been sought in the disadvantageous social position of women in the Netherlands.¹²

Sex differences in morbidity may be based on self-reported perceptions of symptoms, such as those stated by the respondents in health surveys, or on physicians' evaluations of patients' health status through standardized examinations, ie, clinical diagnoses. The first measures aspects of illness behavior, and the second measures aspects of morbidity. In the present study we analyzed medical diagnoses and health problems that were registered by general practitioners.

To understand the contribution of sex difference to medical diagnoses, diagnostic testing, and referral in primary care, differentiation between various types of health problems may be helpful.²

The aim of our study was to investigate sex differences in health problems and the use of secondary medical care in patients presenting in general practice, and to focus on the types of problems for which care was sought.

METHODS

Our study is a population-based retrospective study. First, we compared male and female health problems presented in primary care, and second, we compared male and female use of additional facilities, such as radiography, and specialist medical care.

For our comparisons, we used data from patients in the practice population of the continuous morbidity registration project (CMR) of the department of general practice at Nijmegen University, the Netherlands. The population of the CMR comprises the patient populations (about 12,000 individuals) of four general practices affiliated with the University. This population is representative of the total population of the Netherlands.^{16,17}

Because the study period ranged from 1988 to 1992, our database comprised 60,000 patient years (12,000 patients \times 5 years). All analyses are based on these 60,000 patient years.

From the database we derived the patient's age, sex, and socioeconomic status (SES). The latter is

classified according to the profession of the head of the family, using a standardized list of professions in the Netherlands that is divided into three classes: lower, middle, and upper.

Health problems were categorized into CMR rubrics that were drawn from the International Classification of Health Problems in Primary Care (ICHPPC-2). Congenital and neonatal diseases were not included in the diagnostic rubrics because our study focused primarily on sex differences with respect to contracted diseases. Although the CMR registration project has been described elsewhere,¹⁴⁻¹⁶ some of its aspects are reiterated here because of their relevance to our study.

THE CMR DATABASE

The CMR database has been used to analyze family practice morbidity and morbidity trends since 1971, and as an index for the recruitment of groups of patients for additional research. The relevance and the limitations of the CMR are directly influenced by the Dutch health care structure: every general practitioner has a fixed list of patients (the practice population), and he or she is the gatekeeper of access to specialist medical care. All specialists report back to the general practitioner. As a consequence, all primary health care provided to the CMR population, as well as all referrals for other health care, is captured by the CMR data set.

The CMR distinguishes between new problems (incidence) and continuing or chronic problems (prevalence). All new problems presented to the general practitioner are recorded, including, as appropriate, the cause of death and the diagnoses made after referral. Referrals for specialist and paramedical care and diagnostic procedures are recorded under the diagnosis concerned. If the disease continues to be relevant to the patient's condition, later presentations in the following years are recorded with a prevalence code to signify a continuing or chronic problem.

The CMR classifications are primarily disease oriented. Each episode of care is classified and coded according to the ICHPPC-2.¹⁸ Classifications are corrected after follow-up whenever necessary. Registration is independent of the number of visits during each health problem, and therefore the CMR yields no information with respect to frequency of physician-patient contact.

DEFINITIONS

The CMR contains physicians' diagnoses. When a definitive diagnosis cannot be obtained, patients' symptoms are codified. If both complaints and symptoms are absent, patients' problems and requests are registered. The CMR, therefore, includes in the term *diagnosis* a broad range of diseases and problems presented by patients in general practice. In this article we use the more general term *health problems*. Overall morbidity for patients in this study comprises the total number of registered ICHPPC-2 health problems per 1000 patient years over a period of 5 years.

All specific health problems used in the registration project have been assessed and coded for their potential severity. Three categories for measuring severity were used: *serious*, ie, the disease threatens the patient's life, or has a long-term impact on the patients' functional capacities; *moderately serious*, ie, the disease temporarily interferes with the patient's functional capacity; *not serious*, ie, the disease does not influence the patient's functional capacity. A fourth category was used to indicate *not otherwise classified*.

Secondary medical care utilization comprises referrals of patients with health problems newly presented in primary care for additional diagnostic procedures such as laboratory tests, radiography, and ultrasonography, and for specialist care and paramedical care, for example, physiotherapy or dietitian services.

According to the definition used in the CMR project, *incidence* in general practices reflects the number of newly presented health problems per 1000 patient years, and *prevalence* the number of ongoing health problems per 1000 patient years. *Number and rate of referrals* represents the number and percentage of newly presented health problems per 1000 patient years that were referred for additional diagnostic investigations, specialist care, and paramedical care. *Sex ratios* represent the incidence of women divided by the incidence of men.

ANALYSIS

For each diagnostic rubric, incidence, prevalence, numbers of referral, referral rates, sex ratios, and the proportional contribution of each diagnostic rubric to the sex difference in overall diagnostic rubrics and secondary medical care utilization were computed.

The contribution of each diagnostic rubric to the sex difference in overall diagnostic rubrics was calculated by dividing the sex difference in incidence per diagnostic rubric by the sex difference in overall diagnostic rubrics, multiplied by 100.

The contribution of each diagnostic rubric to the sex difference in overall secondary medical care utilization was calculated by dividing the sex difference in number of referrals by the sex difference in overall secondary medical care utilization, multiplied by 100.

Finally, two-tailed Student's *t* tests were carried out to test differences in male and female rates. Relative risk (RR) was defined as the chance of women having, or being referred for, a health problem as compared with men.

RESULTS

Women had significantly more health problems than men (2286 and 1598 per 1000 patients, respectively; $P < .001$, RR 1.43). Sex differences in overall health problems and secondary medical care utilization were presented according to the following age groups: 1-4, 5-14, 15-24, 25-44, 45-64, 65-74, and over 74 years. The percentages of women in each age category were 48.7%, 48.1%, 50.9%, 52.1%, 49.7%, 53.6%, and 64.5%, respectively. For each age group, overall health problems for men and women were computed, as well as the number of referrals.

HEALTH PROBLEMS AT PRESENTATION

Female patients over 14 years of age presented with more new and chronic health problems than men. The sex difference in overall health problems was the most striking in the age group 25 to 44 years of age ($P < .001$, RR 1.77) (Figure 1).

With the exception of trauma, health problems occurred more frequently with women than men in all diagnostic rubrics (Table 1). Sex ratio differences were the highest in the rubrics "screening and health education" and "genitourinary system diseases," with ratios of 4.7 and 4.3, respectively. Other diagnostic rubrics in which women clearly outnumbered men were blood diseases (sex ratio 3.5), infectious and parasitic diseases (1.7), neoplasms (1.6), and mental disorders (1.5) (Table 1).

Screening and health education (includes contraception, health advice and prevention, and screening and diagnostic procedures) accounted for the major

part of the sex difference in relation to the other diagnostic rubrics overall (31.9%), followed by genitourinary system diseases (18.1%) and diseases of the respiratory system (10%) (Figure 2, Table 1). The most common health problems in these three rubrics were, respectively, cervical smears, urinary tract infections, and common colds. The remaining sex difference was due to more infectious diseases among women (contribution of 9.3%) and problems related to pregnancy and childbirth (9.4%). A negative percentage in the category of trauma offset the sex differences as reflected by the total of these percentages by approximately 9%. Mental disorders contributed 6% to the sex difference in overall diagnostic rubrics. Figure 2 shows that six other diagnostic rubrics contributed more than 6% to the sex

difference in overall diagnostic rubrics.

In all four severity categories (Table 2), the number of newly presented health problems per 1000 patient years was higher for women than for men; however, per category, the percentage of overall diagnostic rubrics was smaller for women than for men in all four severity categories, except for the category "not otherwise classified."

With regard to socioeconomic status (Table 3), female overall morbidity was greater in the lower, middle, and upper classes compared with male overall morbidity. The percentages of women per social class were 49.1%, 53.7%, and 50.6%, respectively. For both men and women, overall morbidity was highest for patients in the lower SES group; about 50% of all coded health problems of men were

FIGURE 1

Overall health problems: incidence per 1000 men and 1000 women per year, by age.

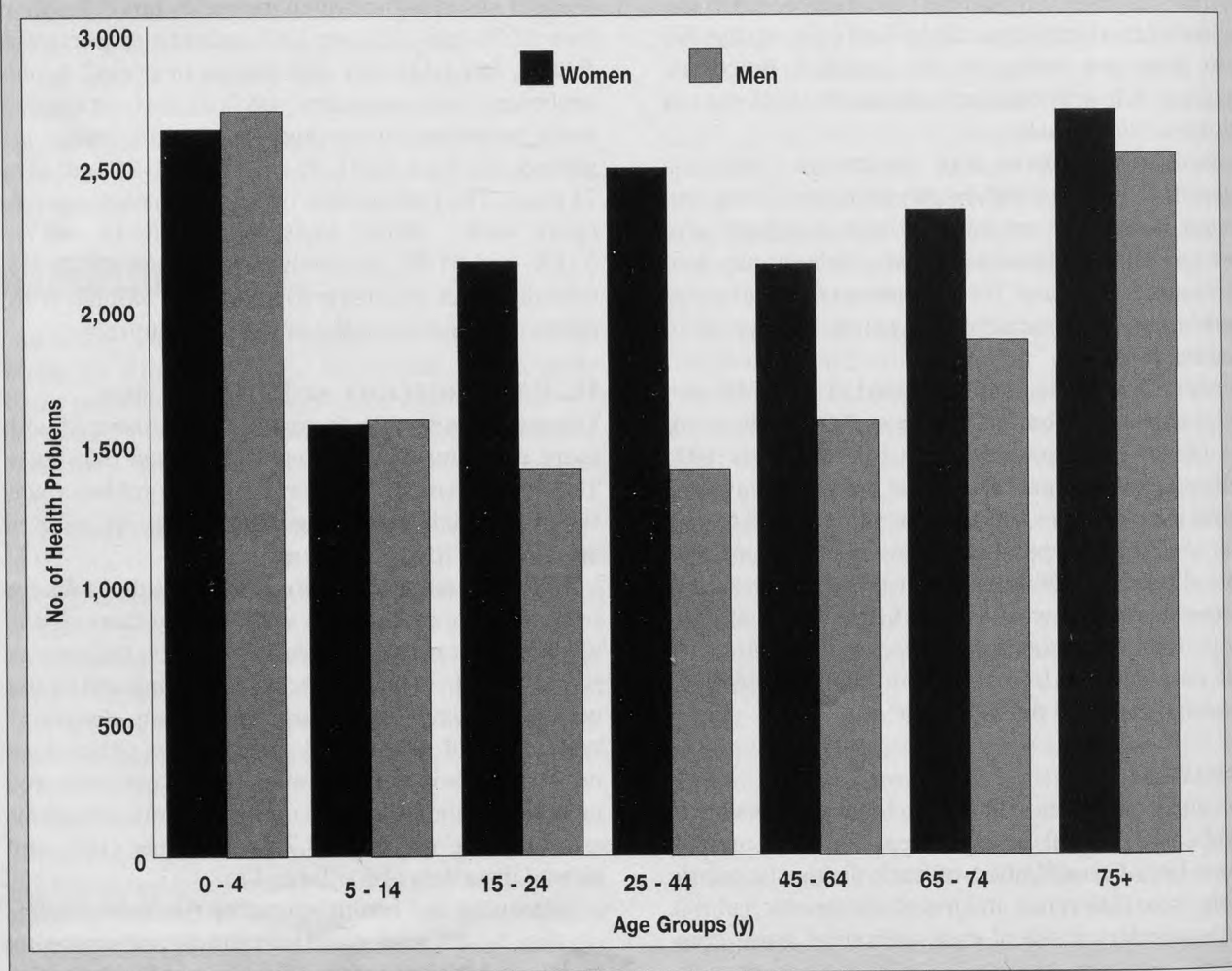


TABLE 1

Sex Ratios Based on Incidence and Prevalence per Diagnostic Rubric, and Contribution of Each Rubric to the Sex Difference in Overall Rubrics

Diagnostic Rubrics	Sex Ratio		Contribution, %
	Incidence	Prevalence	
Infectious and parasitic diseases	1.7	1.7	9.3
Neoplasm (malignant and benign)	1.6	1.8	1.5
Endocrine and metabolic diseases	1.2	1.6	0.8
Blood diseases	3.5	2.6	1.0
Mental diseases	1.5	1.6	6.0
Neurologic and sense-organ diseases	1.1	1.1	2.5
Diseases of the cardiovascular system	1.4	1.5	2.1
Diseases of the respiratory system	1.3	1.2	10.0
Diseases of the digestive system	1.2	1.2	1.8
Diseases of the genitourinary system	4.3	4.4	18.1
Pregnancy, childbirth, and puerperium			9.4
Diseases of skin and subcutaneous tissue	1.3	1.4	7.5
Diseases of the musculoskeletal system	1.2	1.3	5.2
Symptoms	1.3	1.3	1.5
Trauma	0.7	0.7	-9.3
Screening and health education	4.7	8.4	31.9

recorded for men in the lower SES group, as compared with 42% of all health problems presented by women. Based on the assumption that women are in a disadvantageous social position, one might expect a high concentration of female patients in the lower SES group; however, of all patients in that SES group, the percentage of female patients was about 49%, that is, more than one half were male. Sex differences in diagnostic rubrics were highest in patients with in the middle SES group and lowest in patients in the lower SES group.

REFERRED CARE

Women showed a significantly greater use of secondary medical care as compared with men: 603 vs 376 health problems referred per 1000 patients per year, respectively ($P < .001$, RR 1.61). The use of secondary medical care was greater in female patients over 14 years of age. The sex difference was the most striking in the age group 25 to 44 years of age ($P < .001$, RR 2.18)(Figure 3). The main rubrics contributing to the sex difference in the use of secondary medical care were screening and health edu-

TABLE 2

Comparative Incidence of Health Problems and Their Distribution (%) for Men and Women, by Severity

Severity	Incidence			Distribution %	
	Men	Women	Women minus Men	Men	Women
Serious	46.4	51.8	5.4	2.9	2.3
Moderately serious	333.0	423.2	90.0	20.9	18.6
Not serious	937.3	1213.4	276.1	58.9	53.18
Not otherwise classified	276.0	593.0	317.0	17.3	26.0

TABLE 3

Comparative Incidence of Health Problems and Their Distribution (%) for Men and Women, by Socioeconomic Status

Socioeconomic Status	Incidence			Distribution, %	
	Men	Women	Women minus Men	Men	Women
Low	1841.1	2463.8	622.7	50.1	42.5
Middle	1442.5	2224.6	782.1	39.5	46.4
High	1250.9	1895.4	644.5	9.9	10.0

ation (63%), genitourinary system diseases (12.6%), and mental disorders (9.6%). Trauma reduced the total of these percentages by 10.5% (Figure 4). The most common health problems in these rubrics were, respectively, cervical smears (cytopathologic laboratory investigations), urinary tract infections (microbiologic laboratory investigations) and breast diseases (mammography), and nervous-functional complaints, ie, complaints related not to organic lesions but to tensions in life or work situations.

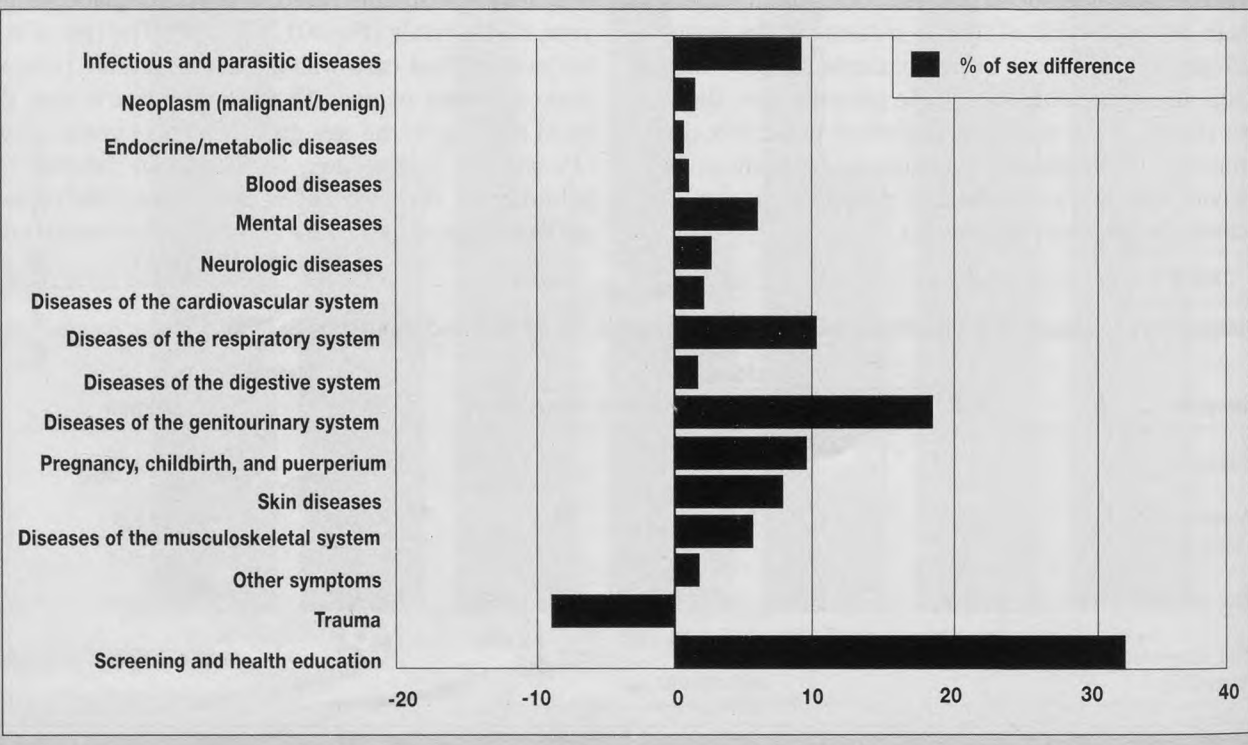
The rubric mental disorders contributed 10% to the sex difference in secondary medical care uti-

lization. Figure 4 shows that there are two other diagnostic rubrics, genitourinary diseases and musculoskeletal disorders, with a contribution higher than 10%.

With regard to the various types of health care to which patients were referred (Table 4), for both men and women the number of referrals to specialists and number of referrals for paramedical care were the highest (101.9 and 118.5, respectively, for men, vs 121.3 and 138.7, respectively, for women), with a small sex difference (contribution of 8.5% and 8.9% to the sex difference). The sex difference in the use

FIGURE 2

Contribution (%) to sex difference in overall morbidity per diagnostic rubric.



of secondary medical care was mainly due to the greater number of pathologic and microbiologic laboratory investigations for women than for men (105.7 and 41.0, respectively, for women, vs 3.4 and 10.8, respectively, for men). Of the 105.7 referrals of women for pathologic laboratory investigations, 91.2 (approximately 86%) were accounted for by cervical smears. A positive cervical smear accounted for 2.5, or 2%, of referrals. Of the 41.0 referrals of women for microbiologic laboratory investigations, 20.5 were accounted for by blood screening tests before and during pregnancy. As shown in Table 4, additional diagnostic procedures contributed 83% to the sex difference in the use of referred medical care, of which pathologic laboratory investigations contributed nearly 45%.

Referral rates for specialist and paramedic care

were higher for men than for women (13.8% as compared with 11.4%), but because of the greater number of overall diagnostic rubrics for women, the number of referrals was higher for women.

DISCUSSION

The results of this study revealed that women present with more health problems and use more secondary medical care in the general practice setting than men. These findings are supported by the findings in the literature.^{2,8}

The purpose of our study was to find out which types of health problems accounted for these sex differences. We also wanted to test whether the explanations we found in the literature^{7,11,12} would explain the sex differences we found in overall morbidity

FIGURE 3

Overall secondary medical care utilization: number of referrals per 1000 men and 1000 women per year, by age.

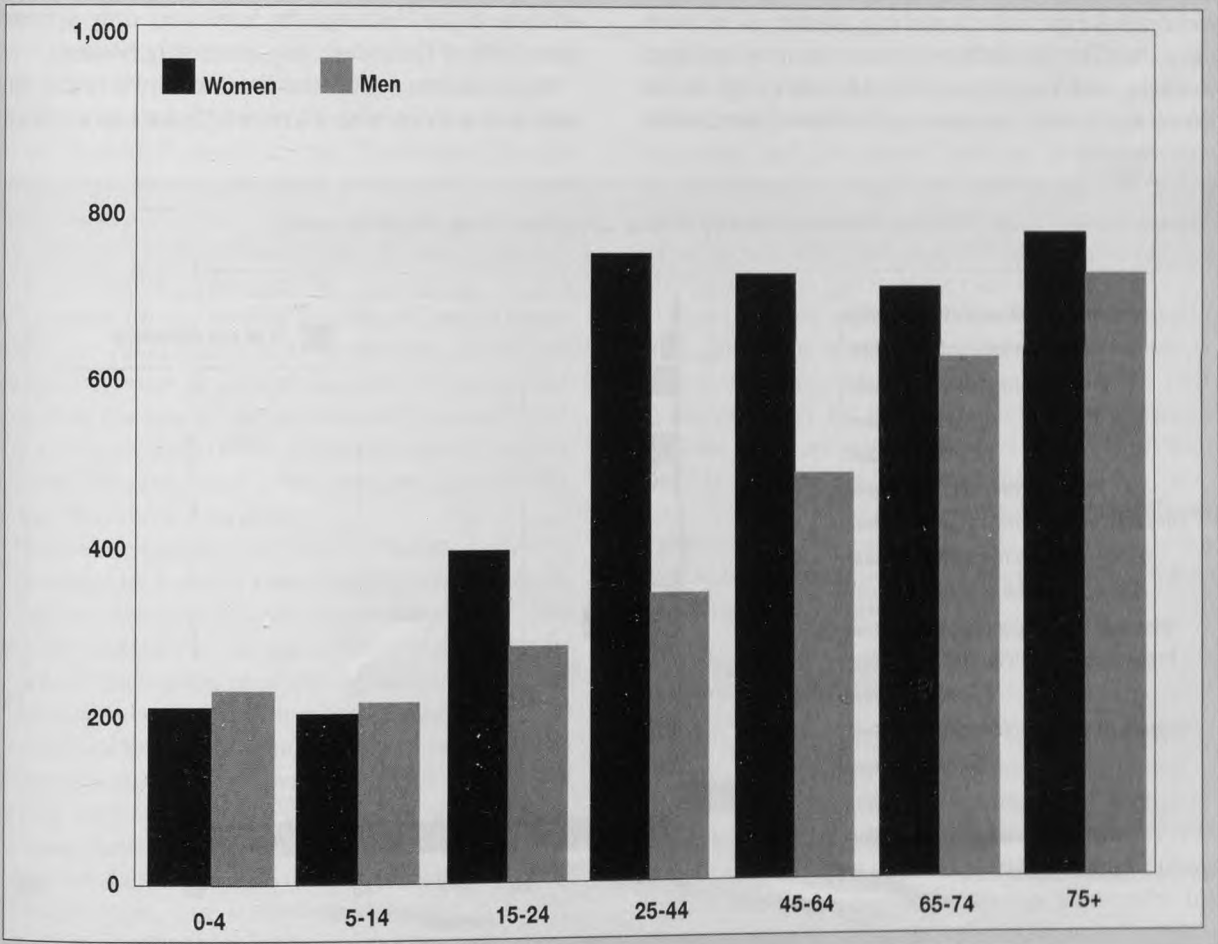


TABLE 4

Referrals for Diagnostic Testing and Specialist and Paramedical Care in Men and Women, and Contributions (%) to the Sex Difference in Overall Medical Care Utilization

Referred Care	Referral Rate*		No. of Referrals†		Women minus Men No.(%)
	Women	Men	Women	Men	
Chemistry panels	4.6	4.8	105.6	76.6	29 (12.7)
Bacteriology	1.8	0.7	41.0	10.8	30.2 (13.3)
Pathology	4.6	0.2	105.7	3.4	102.3 (44.9)
Radiography	3.1	3.5	70.5	56.1	14.4 (6.3)
Ultrasonography	0.7	0.2	16.8	3.9	12.9 (5.7)
Specialist	5.3	6.4	121.3	101.9	19.4 (8.5)
Paramedic	6.1	7.4	138.7	118.5	20.2 (8.9)
Remaining			1.2	2.0	-0.8

*Referral rates reflect the percentage of newly presented diagnoses that were referred for laboratory, ultrasound, or radiography investigations or for specialist or paramedical care.

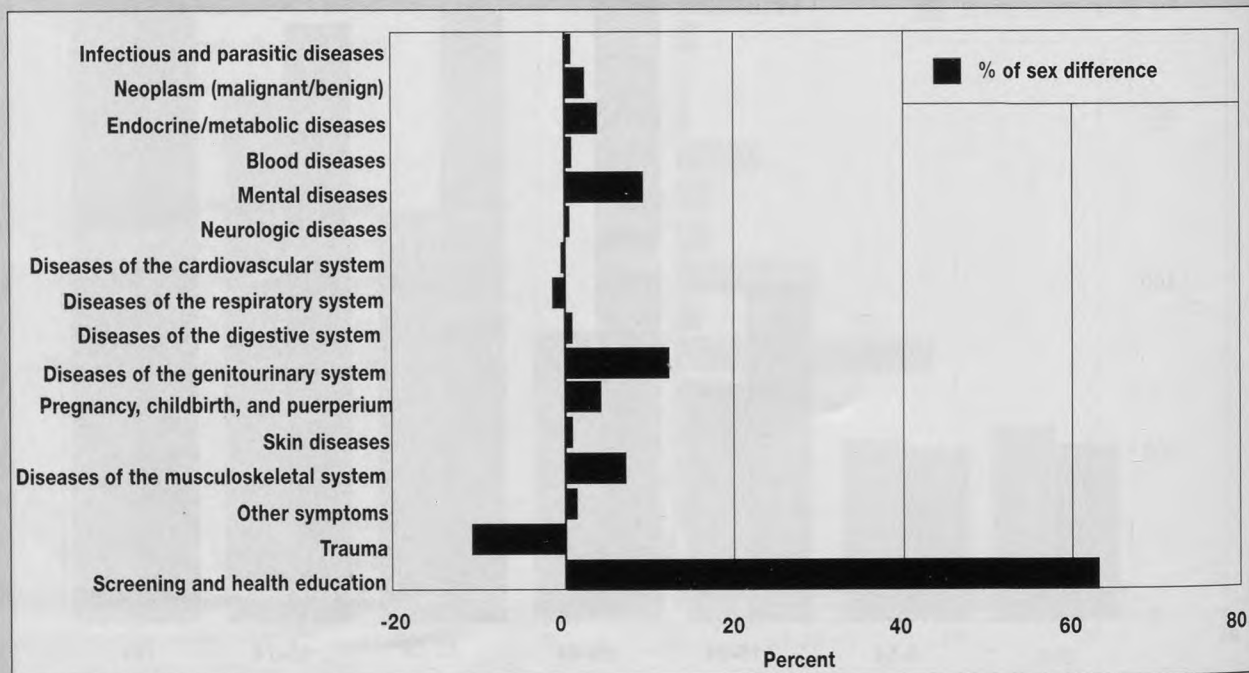
†No. of referrals represent the number of new health problems per 1000 patients who were referred for additional diagnostic investigations, or for specialist or paramedical care.

and the use of referred medical care. Our results confirm the findings in the literature that the greater life expectancy of women gives rise to more health problems for the elderly and to a greater use of medical care.⁸ The sex difference was the most striking, however, in the age group 25 to 44 years of age. In the oldest age groups, women outnumbered men, while

the presented health problems were almost equal for both. Therefore, the higher life expectancy of women is not likely to account for the disparity in health care utilization between men and women in the general practice setting. It is possible that the elderly seek care while in nursing homes, but these data are not included in the CMR project. With more women than men in nursing homes, sex differences in health problems and secondary medical care use in general practices might be effaced. In the Netherlands, however, only approximately 2% of the elderly are in nursing homes.

In accordance with the literature, we found that men and women with a lower SES had more health

FIGURE 4

Contribution (%) to sex difference in overall secondary medical care utilization per diagnostic rubric.


problems than those in the higher socioeconomic groups. Since there were more male than female patients in the low SES group, women being in the lower SES group cannot explain the greater number of women's health problems and greater use of referred care found in our study. Classifying the registered diagnoses by diagnostic rubrics appears to help us understand where the differences lie in the use of health care. We found that the presentation of more health problems by women and women's higher use of secondary medical care were partly accounted for by disorders of the genitourinary system, but above all, by screening and health education. The large sex difference in the screening and health category in particular was unexpected. The exclusion of the combined contribution of these two categories and the category pregnancy and child-birth would diminish the sex difference in overall health problems by 60% and the sex difference in secondary medical care utilization by as much as 80%. The remaining part of the sex difference in overall health problems was caused by diseases of the respiratory system (eg, common colds) and infectious and parasitic diseases (eg, candida vaginitis). The remaining part of the sex difference in the use of secondary medical care was caused by diseases of the musculoskeletal system and nervous-functional complaints.

In contrast to assertions in the literature,³ the category of mental disorders did not account to any great extent for the greater number of female health problems (6% contribution to the sex difference). The contribution of mental disorders to the sex difference in the use of secondary medical care, however, was quite high (9.6%). Could this mean that general practitioners more often referred women with mental disorders than men?

There are several limitations to our study design. As in many large-scale research projects on health, we had to rely on imprecise measurements of medical care utilization. As the CMR registration contains no information on the consultation frequency of the patients, and the number of diagnoses does not necessarily equal the number of physician visits, no conclusion can be drawn regarding this aspect of primary care utilization. Prior studies of CMR data, however, have shown a strong correlation between number of diagnoses and number of visits.

Furthermore, our study was designed to assess only the rate of health problems among patients who

are seen by the general practitioner or the specialist, not the rate within the population. In the Dutch national health care system, the general practitioner has a significant gatekeeping function. The utilization discrepancy by gender may be wider than reported here. A clear advantage of our registration system over plain utilization data is that it allows for a more precise and detailed differentiation of the types of health problems for which care is sought.

As mentioned earlier, health problems in the CMR involve diseases, complaints, and consultation for preventive activities. Some authors state that consultation for preventive purposes should be considered a distinct category of health behavior, and should not be included in morbidity figures.^[2,20] Nevertheless, according to the CMR system, "screening and prevention" were included in the term *diagnostic rubrics*.

Health complaints appear to be strongly influenced by psychological variables, and illness behavior is often assessed rather than illness itself.¹⁰ Because of this, the greater number of health problems that women present with may be caused by an excess of real illness or by an excess of illness behavior; and because the observed rate of women's use of screening and preventive services is higher than men's, it may be that illness behavior as well as the number of occurrences of illness is reflected by differences between men and women in recognizing health problems and seeking care for them.

Finally, in our study the differences between the health problems of men and women and their use of secondary care were not tested by other confounders, such as smoking and marital status, because these are not included in the CMR project. The SES and the severity of health problems, however, could be derived from the database. Notwithstanding these limitations, the study yields important and unexpected differences in how men and women utilize primary care.

SUMMARY

Screening and health education play a major role in the larger number of health problems presented to the general practitioner and in the use of additional diagnostic procedures and referrals for health problems of women. It is important to know that opportunities for screening tests set up especially for women are used so intensively. It seems clear that

the greater health care utilization by women is partly the result of screening for diseases of the cervix and breasts, as well as pregnancy and childbirth problems with attendant hospitalizations. Finally, the greater life expectancy of women, their disadvantageous social position, and their presentation of mental disorders did not appear to be important variables with regard to the greater number of women's health problems.

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